Handbook of Research on

Management Techniques and Sustainability Strategies for Handling Disruptive Situations in Corporate Settings

Rafael Ignacio Perez-Uribe, David Ocampo-Guzmán, Nelson Antonio Moreno-Monsalve, and William Stive Fajardo Moreno

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Handbook of Research on Management Techniques and Sustainability Strategies for Handling Disruptive Situations in Corporate Settings

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Given that the COVID-19 pandemic resulted in an unprecedented scenario, there were no previous lessons learned about the organizational responses to social problems. As a result of the above, this chapter describes the practices used by seven Colombian organizations to face the first months of the pandemic based on corporate social innovation framework. A qualitative approach was used to carry out the study and a qualitative content analysis as a research method. The results obtained indicate that the companies participating in the research developed actions in the four pillars, with actions associated with social issues being more prevalent, especially concerning workers and vulnerable populations.

In this chapter, the results concerning the modeling of companies' disappearance from Bogota's market using machine learning methods are presented. The authors use the available information from Bogota's Chamber of Commerce, where the companies are registered yearly. The dataset comprises the years 2017 to 2020 with almost 3 million registries. In this work, a deep analysis of the different features of the data is presented and explained. Next, four state-of-the-art machine learning models are trained for comparison: logistic regression (LR), extreme learning machine (ELM), random forest (RF), and extreme gradient boosting (XGBoost), all with five-fold cross-validation and 50 steps in the randomized grid search. All methods showed excellent performance, with an average of 0.895 in the area under the curve (AUC), being the latter algorithm the best overall (0.97). These results are in agreement with the state-of-the-art values in the field and will be of paramount importance to assess companies' stability for Bogota's local economy.

This research work aims to analyze how project management tools and techniques help project managers to deal the disruption in projects in the Colombian business context. Firstly, a detailed literature review about project management and disruption was conducted. Secondly, a comprehensive scientometric analysis of project management and disruptive situations on this kind of endeavor was undertaken. Thirdly, tools and techniques suitable for handling disruptive situations on projects were identified. Fourthly, an extensive fieldwork over 700 organizations from the Colombian organizational context was executed. Fifthly, a detailed statistical analysis was carried out to determinate how project management tools and techniques contribute to handle disruption on this kind of initiatives. And finally, research findings were documented, a positive effect of the use of project management tools and techniques to face disruptive situations on project was found, conclusions were set, and future lines of research were defined.

guided the management of the company during the COVID-19 pandemic, allowing them to achieve economic and social sustainability. It was evident that values such as solidarity promoted by the founder and integrated into the organizational culture have directed the management of the company in times of pandemic, avoiding the dismissal of its workers.

Chapter 16

Happiness, job competence, and emotional competence, from an integrative perspective, are incorporated with the characteristics of the collaborator and the factors of the organization. They are emphasizing the classification of job skills and the opportunity to include emotional skills as a specific section. At the same time, it reflects on the components of happiness proposed by Seligman and the interest in relating it to job satisfaction based on the preceding scientific research. Finally, the usefulness of emotional competence is analyzed as a specific section within the general labor competencies, once happiness is considered as an emotion and therefore labor competency.

Chapter 17

During the last years, universities have been developing the concept of creation of technology-based enterprises (TBE – spin off) as an answer to a global culture of development of science, technology, and innovation as mechanisms to structure new models of entrepreneurship in universities, being nurtured by technology and private-public alliances. With that in mind, the Plus Management Model for the Creation of Technology-Based Spin Offs Project was developed. It was aimed at developing a systemic methodology so universities, enterprises, and the government can articulate their efforts to develop spin offs of technology-based enterprises; thus, science, technology, and innovation become the core of competitiveness, the development of the society and organizations.

Chapter 18

Intending to lead organizations to continuous improvement, this chapter proposes a methodology that involves three axes: risk management, problem- solving, and feedback experience. This methodology allows organizations to characterize the experiences they have already confronted, as well as new experiences (which can be risks or problems) with the use of taxonomies established by the organization. It also enables them to capitalize and exploit their knowledge base. This work proposes a best-use approach of the past experiences that are similar to a current event and facilitate their treatment and provide solutions. The authors take the feedback as a point of articulation between the two methodologies because it is a mechanism that offers knowledge where it can be found that the organizations must avoid and take advantage of.

Chapter 19

Increases in business performance are essential for an organization's success in both the public and private sectors. Using the Hofstede organizational culture model, the chapter has centered emphasis on factors that affect primarily financial results. In this study, the authors look at the importance of organizational culture traits as a predictor of financial performance in Colombian and Ecuadorian companies. They discovered that despite Colombia and Ecuador having similar histories and cultures that can be similar to a high level, in volatile and rapidly evolving settings, strategic approaches that concentrate on both distinction and low costs at the same time are often in conflict with Porter's classic approach.

Chapter 20

An organisational model in open innovation is proposed for the Colombian Air Force that could be implemented in the institution or in other military entities, as well as in companies with hierarchical structure. It includes a new perspective of the articulation of the university, enterprise, and state with the theoretical foundations of open innovation. The main objective of this research was to design an open innovation (OI) model to articulate the actors of the Science, Technology, and Innovation System (ST&I) of the COLAF, throughout a qualitative approach of documentary review, where variables of open innovation, internal, and the external factors of open innovation were defined for the subsequent construction and proposal of the model. Concluding, the construction of this OI model for the COLAF could allow an inclusive and binding model of Colombian society with university, enterprise, and state to join efforts and to cooperate for achieving an stable innovation ecosystem.

Preface

The competitiveness of companies is an issue that worries leaders and managers worldwide. Problems such as corruption, poor practices in hiring processes and the lack of focused and equitable public policies have been affecting the productivity of countries and consequently the quality of life of their citizens. In this way, productivity leads to the growth of the average per capita income and consequently the social welfare indexes improve. In general, a competitive economy is one capable of growing sustainably, generating opportunities and equality (The World Economic Forum 2018).

In order to contribute to the development of business sophistication and innovation, and in this way contribute to overcoming the difficulties in terms of poverty and low competitiveness of the productive sectors; The development of mechanisms that allow the adaptation of companies to globalized environments such as those posed by the current market is presented as an important challenge, in this sense, good management practices constitute an opportunity for organizational development, aligning with the strategy for achieve results with high added value (Clegg, Killen, Biesenthal, & Sankaran, 2018).

The aim of this publication is the compilation and dissemination of good organizational management practices for disruptive situations. To achieve this, the work of research experts from around the world has been integrated.

The chapters included in this publication provide research results, both theoretical and practical, on the different organization management topics. The authors want to give the reader a starting point about how to face the moments of crisis and that their organization is not affected in its competitiveness index.

The target audience for this book are academics, entrepreneurs, managers, government officials and professionals from any field. The book will be a useful tool for academic institutions, undergraduate and graduate students in business and entrepreneurship areas.

INNOVATION AND SUSTAINABILITY

Innovation has brought with it the possibility of reinventing society through the adoption of new knowledge immersed in products, processes and services. The generation of social value has been reflected in the evolution of the different economic sectors in which the projects have managed to deliver clear and innovative results, allowing the development of communities and the strengthening of people's quality of life (Serrador & Turner, 2015).

Kim & Mauborgne (2001) claim that for a company to be successful on its innovation path, it must consider three key evaluation criteria: 1)the utility that the buyer can find in the product, an effect that will motivate him to buy it; 2) the setting the price, must be competitive and respond to the reality of

the market in which the innovation is marketed; 3) the cost structure must be consistent and solid with the manufacturing process, allowing the company to obtain the highest profit margin without sacrificing product quality.

Mcadam and McClelland (2005) present in their research two conditions to promote innovation in an organization: the creativity of its collaborators and the innovative purpose of the organization. If creativity is well valued by work teams, new alternatives emerge that strengthen continuous improvement and the quality of results. Likewise, when managers facilitate and encourage the generation of ideas, companies manage to mature their processes more quickly through the adoption of new knowledge, all this results in the quality of life of stakeholders.

Regarding the concept of sustainability, the General Assembly of the United Nations (1987) manifested the responsibility that humanity has for social and economic development to be lasting, guaranteeing the satisfaction of current needs without compromising the well-being of future generations. This statement puts the current transformation capacity of countries to the test, in a scenario characterized by high rates of overpopulation, pollution, consumption, poverty and migration, in addition to the short life cycles of products and economic deterioration as a result of the pandemic.

Undoubtedly, these new scenarios challenge the transformation capacity of organizations, forcing them to be in constant innovation, adapting to new demands, not only of the market, but also of the changing environment. Consequently, good management models and practices must also evolve, to provide managers with new and better tools that they can use to strengthen their competitiveness in an efficient and sustainable way, and that is what this book is about.

BOOK ORGANIZATION

This book is organized into 24 chapters. A succinct description of each of the chapters follows:

- **Chapter 1: Organizational Sustainability and Value Creation Through Innovation in Chaotic Environments.** Between 2017 and 2020, the RISE Model (Route of Innovative and Sustainable Companies) has been applied in Colombian organizations of different sizes and belonging to different economic sectors. This model allows the top management of any organization to carry out a comprehensive evaluation of the company by analyzing nine organizational factors in four specific dimensions: social, environmental, managerial and economic. This chapter aims to answer questions such as: What variables best explain the phenomenon of value creation through innovation? In which variables should the upper echelons concentrate their efforts to generate value and provide sustainability?
- **Chapter 2: Incidence of Organizational Culture in Digital Transformation Projects.** Organizational culture can be defined as the set of characteristics that distinguishes one organization from another, through the establishment of norms and values that describe the behavior of the people who work there. Little by little, organizations have realized that digital transformation goes far beyond a simple technological change, it requires the alignment of organizational strategy, people, culture, mentality, the development of human talent and leadership. The purpose of this research work is to identify, through the application of a correlational statistical model, the impact of the organizational culture on the success of digital transformation projects.

- **Chapter 3: Research on Corporate Sustainability – A Systematic Review.** Corporate sustainability (CS) has many advantages such as enhancing brand value, providing reputation, and also focuses on gaining the trust of stakeholders. This is a qualitative exploratory study; its goal is to understand how CS research has changed over time. The most cited articles were selected from the journals indexed in SSCI (2000-2019). 102 articles were selected and analyzed by content analysis method.
- **Chapter 4: Management Practices in Chaotic Environments of MSEs in Bogota.** The purpose of this chapter is to analyze the management practices in chaotic environments followed by micro and small enterprises (MSEs) in Bogota, specifically in the neighborhoods of Candelaria, Bosa, Puente Aranda and Tunjuelito, to generate sales and profit. In order to accomplish the foregoing, a co-relation analysis is made among the management practices that can be implemented by MSEs in sales and profit when faced with chaotic environments.
- **Chapter 5: Innovation-Based Lateral Thinking and Intrapreneurship Strategies for Handling Corporate Chaordism.** The economic and social change generated by SARS-CoV-2 is leading to a new geopolitical system dominated by China and the need for higher levels of investment in R&D and innovation, especially in the health system. The world is very vulnerable to global pandemics, and it is expected that, given the intense degree of global interconnectedness of countries. This chapter aims to set up several innovation-based and lateral thinking business strategies to make firms rooted in caordism perform better in disruptive situations.
- **Chapter 6: The Appreciative Inquiry Methodology as an Instrument for the Analysis of the Sustainability of Companies.** There are currently various social innovation practices and efforts to address sustainability and its impact on the world. One of them is the use of the Appreciative Inquiry Methodology (AIM), which results in applying a SOAR analysis focused on sustainability and discovering the strengths, opportunities, aspirations, and results of a company. Thus, the company plays a fundamental role through Corporate Social Responsibility (CSR) that seeks to carry out concrete actions that benefit society. This chapter will define what this methodology consists of, its scope, uses, and initiatives that have adopted it as part of their practices for the measurement and promotion of sustainability.
- **Chapter 7: The Impact of the Work Environment on Innovation and Business Sustainability in SMEs – The Case of San José de Cucuta, Colombia.** Innovation is a process, where the interpersonal relationships of employees are key to the creation of ideas that will contribute to the generation of value for organizations in the face of disruptive environments. This chapter analyzes the relationship between the work environment as a key factor and its impact on the development of innovation processes and business sustainability, taking as a sample 182 SMEs, from different sectors of economics.
- **Chapter 8: Instrument Validation of Organizational Dimensions That Learn in a Context of Chaos.** The ability to learn and thus adapt to change is without doubt one of the most effective tools to emerge victorious in the face of chaos. But how do you know if an organization has this capability? The objective of this study is to validate the instrument of the dimensions of the organization that learns DLOQ (Dimensions of the Learning Organization Questionnaire). The instrument seeks to be an initial intervention tool for contexts of chaos.
- **Chapter 9: Scenario Planning as a Tool to Manage Crises in Chaotic and Uncertain Environments – The Case of the COVID-19 Pandemic.** This chapter will describe scenario planning and establish its value in facing crises and chaotic situations. It explains how research in

the field has evolved and describes context conditions such as uncertainty, crisis, and chaos, which provide fertile grounds for scenario planning. A bibliometric analysis is presented to illustrate the increase in the study of scenario planning as a tool to deal with uncertainty.

- **Chapter 10: Corporate Social Innovation During the COVID-19 Pandemic – Some Practices From Colombian Companies.** Given that the Covid-19 pandemic resulted in an unprecedented scenario, there were no previous lessons learned about the organizational responses to social problems. As a result of the above this chapter describes the practices used by seven Colombian organizations to face the first months of the pandemic, based on Corporate Social Innovation framework.
- **Chapter 11: Prediction of the Disappearance of Companies From the Market in Bogotá, Colombia Using Machine Learning.** In this chapter, the results concerning the modeling of companies' disappearance from Bogota's market using machine learning methods are presented. The authors use the available information from Bogota's Chamber of commerce, where the companies are registered yearly.
- **Chapter 12: Project Management Tools and Techniques to Deal With Disruptive Situations in Projects – An Applied Research in the Colombian Context.** This research work aims to analyze how project management tools and techniques help project managers to deal the disruption in projects in the Colombian business context.
- **Chapter 13: Chaos Management Leadership Resulting From the Pandemic in Ibero-American Universities.** The pandemic and its effects on the development of a new normality in the Latin America education sector has transformed the traditional education systems creating new means of communication, coordination and learning assessment. This study uses a qualitative methodology with descriptive basic statistics, applied to 16 Leaders (Deans and Directors) responsible for the direction and management of universities in an atmosphere of chaos. The above allows creating a conceptual model that explains context components, leadership and initiatives.
- **Chapter 14: Managing Human Resources as a Business Strategy in Times of Disruption.** This chapter establishes a tripartite relationship of high impact and validity in the business world. The three concepts that are intertwined are the management of human talent, disruption and business strategy as drivers in organizations that seek to fulfill the visionary unity that has been proposed in the existing conditions of a particular environment that presents new movements, questions and events derived from factors such as public health, the fourth industrial revolution, care for the environment, generational social interaction.
- **Chapter 15: Cultural Values as Strategic Support to Organizational Sustainability in Times of Pandemic – Case Study of a Company on the Formal Textile Trade Sector in Colombia.** The COVID19 pandemic in 2020 has led all organizations worldwide to rethink their strategies and even the products and services they offered, with the aim of surviving and overcoming the economic and social difficulties that guarantee their permanence in the market. This chapter details the results found in the investigation of a case study in a Colombian organization of the textile sector that accesses the national and international market. Its objective was to determine the values of the culture that have guided the management of the company during the COVID19 pandemic, allowing them to achieve economic and social sustainability.
- **Chapter 16: Happiness – An Approach to Labor Competence.** Happiness, job competence, and emotional competence, from an integrative perspective, these concepts are incorporated with

the characteristics of the collaborator and the factors of the organization. They are emphasizing the classification of job skills and the opportunity to include emotional skills as a specific section.

- **Chapter 17: Model Management Plus for the Creation of Technology-Based Spin-Offs.** During the last years, universities have been developing the concept of creation of Technology-Based Enterprises (TBE – Spin Off) as an answer to a global culture of development of science, technology and innovation as mechanisms to structure new models of entrepreneurship in universities, being nurtured by technology and private-public alliances. With that in mind, the Plus Management Model for the Creation of Technology-Based Spin Offs Project was developed.
- **Chapter 18: Problem Solving and Risk Management Methodology – Feedback From Experiences With the Use of Taxonomies.** Intending to lead organizations to continuous improvement, this chapter propose a methodology that involves three axes: risk management, problem- solving and feedback experience. This methodology allows organizations to characterize the experiences they have already confronted, as well as new experiences (which can be risks or problems) with the use of taxonomies established by the organization.
- **Chapter 19: The Paradoxes Between Business Performance and Organizational Behavior in Colombian and Ecuadorian Companies.** Increases in business performance are essential for an organization's success in both the public and private sectors. Using the Hofstede organizational culture model, this has centered emphasis on factors that affect primarily their financial results. In this study, we look at the importance of organizational culture traits as a predictor of financial performance in Colombian and Ecuadorian companies.
- **Chapter 20: Open Innovation Model Proposal for the Colombian Air Force.** An organisational model in open innovation is proposed for the Colombian Air Force, that could be implemented in the institution or in other military entities, as well as in companies with hierarchical structure. It includes a new perspective of the articulation of the university, enterprise and state, with the theoretical foundations of open innovation.
- **Chapter 21: Entrepreneurial Competencies – An Indispensable Requirement for Business Success: Structural Analysis in the Higher Education Sector.** The entrepreneurial education has had a significant impact on the education system. One of the differentiating elements of business training is the approach that can be achieved through a set of effective competencies. In this work, we will discuss the key competencies that need to be addressed in training future university professionals for business success.
- **Chapter 22: Creating Synergic Entrepreneurship as Support of Sustainability – Opportunities and Challenges.** Going beyond adapting to the changing world in the globalization environment or finding new solutions for different needs is only possible with a broad perspective. This perspective requires strategically selecting the team members while understanding the principles of an effective team and using a participatory approach, culture, and synergy to guide the team to achieve exponential results.
- **Chapter 23: Self-Perception of Leadership in Mexican Businesswomen.** The purpose of this chapter is to analyze the self-perception of their own leadership in Mexican businesswomen. With this information, it can build a female leadership model, which allows knowing the self-perception of skills and characteristics they have as leaders, the situations that led them to use this leadership, the challenges they face daily in the performance of their activities, and the context in which they operate.

- **Chapter 24: Social Media and Social Distance – Revisiting the Restaurant Business Model.** Social media and social distance are radically impacting the way restaurants do business. Such a claim, fairly apparent to the consumer, arguably remains underexplored in the business model literature and begs for supporting evidence. This research aims to bridge such gap, by conducting an empirical study on the effects of social media and social distance on restaurants performance.

Finally, the authors of this book hope to contribute significantly to the strengthening of management practices, through the identification of models and lessons learned, located in a business context. They also thank readers for including them in their future publications as valid research references.

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Section 1
Chaotic Environments and Sustainability

This section is made up of nine chapters that describe how value is generated through innovation in times of chaos, the opportunities and challenges of entrepreneurship for sustainability, and which practices and methodologies could be developed to face chaotic environments.

Chapter 1
Organizational Sustainability and Value Creation by Means of Innovation in Chaotic Environments

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ABSTRACT

Between 2017 and 2020, the RISE model (Route for Innovative and Sustainable Enterprises) has been applied in 86 Colombian organizations of different sizes and belonging to different economic sectors. That model allows any organization's upper management to make a thorough assessment of the company by means of analyzing nine (9) organizational factors with reference to four (4) specific dimensions (social, environmental, managerial, and economic). These nine (9) organizational factors are deployed in 48 variables for analyses, and one of these variables is value creation through innovation. From the assessments and analyses derived from the RISE model, several research-worthy questions arise, such as, Which variables explain better the phenom of value creation through innovation? Which variables must the upper echelons concentrate their efforts on to generate value and grant sustainability? This work aims to present the results of the application of the RISE model and to answer the mentioned questions, especially during these uncertain, chaotic, and turbulent times.

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INTRODUCTION

Amidst all the talk and debate regarding profitability, value creation, innovation, it is paramount to discover just how many organizations can "walk the talk" as Americans are so keen on saying in their colloquial language. And it is not just about the normal, day-to-day, business as usual interpretation of the business world, for whether we like it or not, the world as we used to know it does not exist any longer.

On March 11, 2020, the World Health Organization (WHO) announced that COVID-19 is a pandemic - a disease that is spreading in multiple countries around the world at the same time. This is a rare event, one that we have not seen for 100 years, and humanity is yet to fathom the magnitude of the impact this pandemic will have in people's lives, with public health, economic and political consequences (WHO, 2021).

Now, it is not a first for mankind to be threatened by a pandemic. Prior to the current crisis mankind had to deal with global public health emergencies, but they have been less prominent: HIV/AIDS since the 1980s, SARS in 2003, and the 2009 H1N1pandemic influenza. To find a global public health emergency like this one a trip in Marty McFly's DeLorean is mandatory, for 1918 is the year when such an event took place: the **1918 influenza pandemic.**

Although there is not universal consensus regarding where the virus originated, it spread worldwide during 1918-1919. In the United States, it was first identified in military personnel in spring 1918. It is estimated that about 500 million people or one-third of the world's population became infected with this virus. The number of deaths was estimated to be at least 50 million worldwide with about 675,000 occurring in the United States (Jonas, cited by Mineo, 2020).

Regardless of the severe damages and affectations the COVID-19 pandemic has had, companies have endured them, managed to stay afloat and some even have become more profitable!

Between 2017 and 2020, the RISE Model - Route for Innovative and Sustainable Enterprises - (Pérez-Uribe, Ocampo-Guzmán, Moscoso-Duran, Ramírez-Salazar, 2021; Ramírez-Salazar, Pérez-Uribe, Salcedo–Pérez, Huffington Smith, 2019) has been applied in a total of 85 organizations from all walks of life within the Colombian economy. These organizations are of different sizes and belong to different economic sectors, which has created a huge myriad of possibilities for hypotheses' construction.

Just as its forebear, the Model of Modernization for Organizational Management (MMOM), the RISE model was "born and bred" at EAN University, and it is a product from years of devoted efforts and resources to study the genesis of Colombian and Bogotá´s MSMEs. Such efforts have come to fruition in the form of the design of several business and organizational assessment models, two of which are the MMOM and the RISE.

The RISE model allows any organization's upper management to make a thorough assessment of the company by means of analyzing nine (9) organizational factors (1. innovation, 2. sustainable production, 3. leadership and strategic direction, 4. organizational culture, 5. acknowledgement and recognition, 6. collaborative processes, 7. new markets, 8. technology and 9. financial indicators) with reference to four (4) specific dimensions (social, environmental, managerial, and economic).

In turn, these nine (9) dimensions are deployed in 48 variables for analyses, and one of these variables is value creation through innovation. From the assessments and analyses derived from the RISE model several research worthy questions arise, such as: Which variables explain better the phenom of value creation through innovation? In which variables the upper echelons must concentrate their efforts to generate value and grant sustainability?

This work aims to present the results of the application of the RISE model and to answer the mentioned questions, especially during these uncertain, chaotic, and turbulent times. The statistical method used for the validation of the data concerns multivariate multiple regression analysis utilizing the Stratigraphic centurion XVI package.

CONCEPTUAL FRAMEWORK

Innovation: A Foundation for Value Creation

Utilizing innovation as the key building block for an organization's competitiveness, transforms it as an improvement generator, either extensive or gradational, for all business operations, or at the very least, for some of them. Likewise, the fact that we are living in the Information Age has substantially increased not only the need, but the opportunities for companies to undertake successful innovation processes. That is why more and more companies are willing to include creativity techniques when it comes to process, product and service creation, techniques that take full advantage of possible synergies, skills, and proficiencies amongst creative teams.

During such crisis derived from the pandemic, at the brink of the era of the so-called "New Normal", a preponderant need to comprehend where value creation is going to be obtained is growing every single day. To answer such a question, it is of the utmost importance to analyze the ongoing studies regarding global macrotrends, from which two fronts stand out: the European Union and Latin America (ESPAS, 2016; Bitar, 2014). In this sense, five major changes can be found in these prospective analyses that have 2030 as target year. **1) Demography**: a human race more diverse, aging, with a burgeoning middle-class but with a greater social disparity, **2) Climate change:** as Global Warming continues to take its toll on Humanity, the connection between climate change, energy consumption and needs, and competition for natural resources as fresh-water, food, minerals will be made more evident. **3) Power shifts:** interdependence, frail multilateralism, civic empowerment, and government transformations. **4) Industrial and technological revolution:** this entails the development and later diffusion of disruptive technologies, some of which will lead to deep transmutations in employment, production techniques, governability, and human relations. **6) Globalization:** a weakened process of worldwide integration, procuring new migration processes and a different type of cities.

The upcoming wave of changes have been accelerated in their pace by the current crises, and it is a worrying picture for corporate management. Let us revise the **Eight Millennium Development Goals**. Let us revise with scrutiny Goal No. 7 (PNUD, 2015). Environmental Sustainability has become a must since the **United Nations General Assembly** revealed their **Sustainable Development Goals** or **Global Goals**, a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all" (PNUD, 2019).

During its 2018 Summit, the ***Singularity University*** brought to light several breakthroughs on the confines of different scientifical disciplines, breakthroughs that help solve humankind's vital necessities. Singularity University's Summits are an opportunity to stay ahead of the transformational change happening throughout the world. Some of the breakthroughs that were presented then were:

- **Pilotless Electric Cars:** intended both for passenger use as well as for freight transportation.

- **South American Bitcoin:** aiming both at improving business relations as well as making transactions homogeneous and more flexible (Padilla, Castro, Serrato, Navarrete y Pérez-Uribe, 2018).
- **Increasing Robotics and IA Involvement:** process automation will shake the foundation of the workforce, thus promoting a migration towards jobs, trades, and professions that require more technology.
- **Education's Democratization Processes:** as schools, universities, even kindergartens have been forced to migrate their operation to the virtual format, more and more online courses will be demanded and needed, whether they are free of charge or not.
- **Use of Cloned Foods**
- **3D Impressions**

RISE Model: General Structure

The RISE model (Route for Innovative and Sustainable Enterprises) is a business diagnosis model, just like one of its predecessors, the **Model of Modernization for Organizational Management** (MMOM, all copyrights EAN University).

It allows an organizations upper echelons to make a thorough assessment of their organization by means of analyzing four (4) specific dimensions (social, environmental, managerial, and economic) with reference to nine (9) organizational factors: 1. innovation, 2. sustainable production, 3. leadership and strategic direction, 4. organizational culture, 5. acknowledgement and recognition, 6. collaborative processes, 7. new markets, 8. technology, and 9. financial indicators. According to EAN University's G3Pymes, these 9 factors generate the greater impact within companies' management (Perez-Uribe and Ramírez- Salazar, 2020).

Research and consulting work developed by the one of EAN University's most prestigious research groups, known as the *G3Pymes*[1], have led to the creation of different business assessment models aiming at the transformation of **Colombian Small and Medium Sized Enterprises (SMEs)** into competitive and sustainable organizations. It is safe to state that the RISE model is a symbiosis of those (Perez-Uribe *et al.*, 2020). Table 1 relates each factor with each dimension and explains each dimension's descriptor.

The RISE model employs a 0 to 100 percentage scale to classify the results obtained by its application (Ramírez-Salazar, Pérez-Uribe, Salcedo-Pérez, and Juffington-Smith, 2019), thus classifying the organization in 5 possible stages, described as follows:

1. **Stage One – Incipient/Nascent, 0 to 20%**: An organization in its early stages, therefore all its processes are incipient and/or in the stage of creation. It is a stage of great uncertainty for the organization, on account of the founders/managers are comfortable and seldom do they feel the need to be advised into better managerial practices.
2. **Stage Two – Survival/Livelihood, 21 to 40%:** An organization with more than 4 years of existence, a gargantuan accomplishment. Colombian MSMEs endure the harshest of conditions; paltry governmental support, little to null financial assistance from the banking system and amid these adversities lies the entrepreneur, fighting with tooth and nail to survive, to keep his/her endeavor afloat. This is a level of bridges, of recognizing the enormous value of relations. It is a time for getting acquainted with the company's surroundings in the most aggressive fashion possible. Becoming part of business innovation systems and/or regional clusters is a must during this stage.

Table 1. RISE model

No	FACTORS	DIMENSIONS	DESCRIPTORS
1	**Innovation**	Social	Innovate Way
		Environmental	Ecodesign-Circular Economy
		Managerial	Type of Innovation
		Economical	Value creation
2	**Sustainable production**	Social	Suppliers- Raw materials and / or supplies for the operation
		Environmental	Efficient Use Water-Wastewater-Energy-Atmospheric Emissions, Solid Waste
		Managerial	Environmental Plans, Seals and Certifications
		Economical	Budget for Environmental Management - Circular Economy Business Model
3	**Leadership and Strategic Direction**	Social	Social Trends, Mobilization-Ethics Capacity, Values and Anti-Corruption Policy
		Environmental	Accountability-Value of Sustainability
		Managerial	Corporate Governance-Knowledge Management-Corporate Strategies.
		Economical	Environment Analysis-Decision Making
4	**Organizational culture**	Social	Work environment
		Environmental	Paradigm Shift
		Managerial	Communication
		Economical	Shared value
5	**Recognition**	Social	Happiness at work
		Environmental	Environmentally Conscious Worker
		Managerial	Motivation Practices
		Economical	Valuation at Work
6	**Collaborative processes**	Social	Associativity
		Environmental	Work Safety
		Managerial	Agreements - Consensus
		Economical	Corporative volunteering
7	**New markets**	Social	Degree of Influence on other Markets of Goods and / Services
		Environmental	Green Markets
		Managerial	Strategic Plan to enter New Markets
		Economical	Commercial strategy
8	**Technology**	Social	Democratization of Technologies
		Environmental	Clean technologies
		Managerial	Prospective
		Economical	Technology Transfer
9	**Financial indicators**	Social	Impact on stakeholders
		Environmental	Protection and / or recovery of the environment
		Managerial	ROA = Return on assets
		Economical	Financial performance of EBITDA Margin

Source. Authors from Pérez-Uribe, et al., 2020

3. **Stage Three – Development, 41 to 60%:** An organization that is experiencing growth in sales and in market share. Purchasing technology, trying new and innovative manners to manufacture goods and provide services, hiring new personnel, searching for external sources to finance its growth and highly likely immersing in foreign trade by means of importing, but most importantly, by exporting. It is a stage where entrepreneurs experiment through trial and error and it is a stage where funding is the key: growing is always expensive, so it is paramount to know just how much the company can grow organically and how much will it cost to obtain external funding.
4. **Stage Four – Outstanding, 61 to 80%:** An organization that separates itself from other companies from the same sector. It is a consolidation phase, where the market niche is highly differentiated and the company enjoys financial stability, both attained by reaching high quality standards in products and/or services. These are crucial times, though. Success leads to complacency, and Colombian idiosyncrasy is especially vulnerable to this fact. Now it is the time to begin the succession planning, a succession that will keep the organization in the route of success, satisfying all stakeholders' needs and expectations.
5. **Stage Five – World Class, 81 to 100%:** Organizations that are universally recognized and valued within the society, not only for the outstanding quality in their products and services, but because their business management and corporate policies, considered as references not only in Colombia, but internationally as well. Mass media praises these organizations' achievements and performance while their executives/founders are exalted in different society levels, such as academic community, public and private management associations. Their social work is also a trademark. The company's brand is recognized by customers and non-customers; it has transcended boundaries. It is a stage where the entrepreneur must stay ahead of trends, of competition, of large companies looking to imitate and/or absorb the organization. It is a time for deep and profound introspection, for the temptation of selling to a bigger company will be hard to ignore!

Value Creation by Means of Innovation to Attain Sustainability Within the RISE Model

If an organization is set to achieve Value Creation by means of employing innovation as the cornerstone for pursuing and achieving an organization's sustainability, it is cardinal to mention three concepts: **eco-design, circular economy**, and **green technologies**, all three tremendously important within the RISE Model.

1. **Eco-Design:** also known as ecological design criteria, this concept is destined to be a vital component in the design or re-design of products, processes, and services. Eco-design brings together and highlights the mutual dependence of the environment, humanity, and sustainable development (Barraqueta, 1998), thusly becoming a pivotal tool in developing an Extended Responsibility Principle (Ramírez & Galán, 2006).
2. **Circular Economy:** a concept that goes all the way back to the "fabulous 90s", circular economy was first brought to prominence by both a famous American architect and a renowned German chemist: William McDonough and Michael Braungart, respectively. Together, they developed a concept and a design philosophy coined as **"Cradle to Cradle" (C2C)** in which ALL production materials are considered useful, hence none of them are wasted, labelling them as nutrients, and classifying them into technical and biological (McDonough, 2007). This was a paradigm shift in

the creation value, for the hideous term **"waste"** was replaced by the nourishing and endearing **"nutrient",** henceforth welcoming the positive impact that product flux brings, rather than trying obsessively to reduce the negative impact of waste material (McDonough and Braungart, 2003).

3. **Green Technologies:** concept that refers to the employment and use of technologies that cause the least negative environmental impact. This can only be achieved if the upper echelons of organizational management possess an acute and robust understanding of the importance of embracing a holistic environmental policy aiming at not only reducing the organization's environmental footprint, but in becoming a beacon for sustainability (Guardiola, Cervantes & Rodríguez, 2018).

Innovation: its True Value

Innovation has never been reduced to one single formula; that would certainly be against the whole concept of innovation! To achieve competitiveness, enterprises innovate in different manners. Whether it is by combining an array of business models, products, services, and processes (Carr, 1999), aiming at preserving and/or penetrating new markets, reducing competitive gaps with competitors and to ensure long-term growth and survival, especially in these turbulent and uncertain times (Eisenhardt & Brown, 1999; Freeman, 1994; Lawless and Anderson, 1996).

Because innovation helps obtaining the results mentioned above, enterprises are stimulated to undertake innovative actions, mainly focusing on types of innovation, economic research, developing new products and enabling core services as value-added differentiators (Freeman, 1994; Miles and Snow, 1978).

The key to achieve commercial success and in obtaining a competitive advantage in the mid-term lies in continuously innovating. In making innovation a basic pillar of all organization politics (Tushman,1997). Long-term success, on the other hand, might rest in the hands of a holistic innovation focus, one that leads to the creation of specific innovations, but that all obeying to a same mandate. No loose cannons.

King and Tucci (2002) and Winter (2003) both endorse the notion that knowledge management is critical. Market dynamism and the economic mobility condition where the innovation process must take place, which competencies must be improved and from there, how is the organization structure and its knowledge going to be altered. From their perspective, changes in the external market are best detected through innovation, and in doing so a company knows which processes and entrepreneurial capabilities are crucial for attaining competitiveness.

Through innovation a company not only would be able to improve its competitiveness, but it can also manage to improve its product and service portfolio. Worren, Moore and Cardona (2002) define innovation as a company's intention of developing new products and encourage employees into developing promising new ideas, ideas that are must be completely lined up with the organization's mission and its vision.

As mentioned above, the human resource is the cornerstone of any innovation process, and as such it must be appreciated. A firm and robust, yet not rigid, organizational structure that serves as an incubator for a collective innovation process, promoting knowledge, guiding, orienting, forming, and coordinating all the organization's capacities is a must have to attain competitiveness (Worren, *et al.,* 2002).

Companies that embrace innovation and that disseminate their innovation processes through their employees build products, processes, design new services and company practices which not only benefit the organization itself, but all of society. Just as an organization can innovate by taking small, incremental steps or by undergoing a radical changing process, any person inside can follow those two processes: small, incremental steps or radical, disruptive ones. Alakeson and Sherwin (2004) have coined two names for the contexts above: operative optimization and systems construction. Innovation has rapidly

positioned itself as one of the business world's hottest topics. Innovation grants a company the option to focus on opportunities, rather than risks. It allows a company the design of different scenarios for the future by utilization of specific practices (Ballantyne and Varey, 2006).

At present time, enterprises acknowledge the myriad of opportunities presented to them by integrating themselves with the outside world. And more and more of that is what is in store for the future; embracing and adopting innovative and sustainable politics that lead to the companies' legitimacy, social approval to operate, and last, but certainly not least, increase its competitiveness. Accordingly, a company's capacity to embrace innovation is a preeminent capacity. One that organizations must strive to develop as part of a plan to progress and competitiveness. This implies the adoption of a comprehensive, innovative policy to transform themselves into competitive, modern, agile, and effective entities. Just as we as human beings must develop the ability to adapt to an ever-changing environment, organizations must follow suit, for their living environment is one that is prone to sudden changes, discontinuities, and an accelerated shortening in productive and commercial cycles (Ballantyne et al., 2006).

Benefits in Creating the Value of Innovation

Stakeholders are essential for the creation of value in a company because for them the company makes decisions that favor them by offering more innovative products, thus, for the different stakeholders, their capacities are strengthened and developed. The capabilities, skills competencies that are evidenced in the creation of value for these stakeholders correspond to greater autonomy, becoming more entrepreneurial, being proactive, enjoying a high degree of employability, being socially integrated, obtaining greater knowledge and skills from the process innovative, awareness towards green work, and therefore be healthier (Garriga, 2014). Information management becomes more valuable since it flows between the members of an entity where the construction of new knowledge is promoted (Nonaka and Takeuchi, 1999; Nonaka, Toyama, and Nagata, 2000), which must be supported by an infrastructure that grant conditions and resources, where ideas can emerge and leverage the company's resources for the deployment of innovative activities and actions for its operation (Barney, 1991). The value creation processes generate innovative and creative responses that respond to the needs and difficulties of customers. The challenges and problems that arise in the company are faced based on an effective application of the resources, capacities, knowledge, and competencies available to the organization (Barney, 1991; Nagles, 2013).

Unstable Economic Environments

There are several aspects that could be summarized at this point, to establish a conceptual framework that defines this type of unstable environments in the disruptive, the chaotic and the schizophrenic.

In most available reading, disruption is related to innovation, however, it could be defined as "[…] an interruption or break with the traditional way of executing something. The word comes from the English disruption, which in turn derives from the Latin "*disruptio*", which means fracture" (Fundéu, 2015). This concept has been used in recent times in the field of management to refer to the introduction of new processes, methods or products that change the way in which they were traditionally made, adding value to the sector to which they are directed. It also refers to what becomes obsolete, since it is not suitable for the new circumstances of business or consumption. Disruptive environments break with the parameters established as acceptable and their disruptive behavior can be a threat to the stability or coexistence of a society and the organizations that compose it. Hence, it is so important to detect and

adequately treat this type of behavior and to seek or create management approaches, methods, and tools for its management (Fundéu, 2015; Perez-Uribe, 2018, p.60 and 61; Mena, 2020).

On the other hand, Christensen, Raynor and McDonald (2015) state that "disruption" describes a process by which a smaller company with fewer resources can successfully challenge the strongest companies in the market. focus on improving their products and services for their most demanding (and generally more profitable) customers, exceed the needs of some segments and ignore the needs of others. Participants who prove to be disruptive start by successfully targeting those segments that are overlooked, gaining ground by offering more functionality, often at a lower price. Even pursuing higher profitability in the most demanding segments, they tend not to respond vigorously.

Boss (2015) states that the disruptive economy offers two opportunities: 1) it allows companies to redefine how and why they work. This organizational awakening leads to the second chance that companies must embrace, 2) a better way to serve the employees who choose to work there because they believe in the purpose of the company. Disruption is the very essence of redefining an organization's value proposition, purpose, or product. In essence, interrupting is ending with X and then creating Y.

To the previous environments is added the concept of chaotic environments that are based on the theoretical and mathematical principles of chaos theory. Gergersen and Sailer (1993) argue that the usual social science goals of "predicting" and "controlling" the behavior of systems are sometimes, if not usually, unattainable. Specifically, chaos theory shows how it is possible for nearly identical organizations embedded in identical environments to exhibit radically different behaviors, even when the underlying systems are extremely simple and completely deterministic. Furthermore, the arguments of chaos theory are general enough to apply to any type of entity, including individuals, groups, and organizations, and are therefore relevant to a large domain of social science problems. Mangiarotti, Coudret, Drapeau and Jarlan (2012) state in this regard that three main problems will be solved in a modeling perspective for a chaotic situation: 1) What are the relevant variables for a given chaos situation? 2) What are the governing equations for coupling these variables? 3) What are the values of the parameters of these equations? Also, among these questions, two very practical questions arise: 4) What observations must be made to build and constrain a model? and, 5) How to reformulate the handling of equations based on the available observations?

According to Letellier (2019) based on chaos theory, the global modeling technique offers an interesting alternative to other approaches: 1) It is well adapted to modeling itself and to the study of unstable dynamic behaviors, 2) it allows to detect and extract the deterministic component underlying dynamic behavior, and as a consequence it can be a powerful approach to analyze dynamics that are highly sensitive to the above conditions and 3) detect chaos (Gouesbet and Letellier, 1994; Lainscsek, Letellier and Schürrer, 2001; Letellier, Aguirre and Freitas, 2009; Mangiarotti, *et al.,* 2020; Mangiarotti, *et al.,* 2012).

In addition to the two previous environments, the schizophrenic environments are added, which refer to those in which a series of variables appear that arrive unexpectedly and make the managers of the organizations confused in making decisions in the face of strategies that already are raised. The reaction is sometimes slow and unfortunate and causes organizations to lose market and most of the time they must leave the field in which they are located. This type of situation makes managers must face a group of chronic and serious mental disorders, often characterized by behaviors that are anomalous for the community, such as: lack of perception of reality, alterations in perception or expression of the alteration of reality (Perez-Uribe, 2018, p.5).

Environmental schizophrenia also causes a sustained change in various aspects of the psychic functioning of the individual and, therefore, of the organizations where he works, "mainly of the consciousness

of reality, and a more or less complex neuropsychological disorganization, especially of the executive functions, which leads to difficulty in maintaining motivated and goal-directed behaviors, and significant social dysfunction". Among the frequent symptoms in the field of organizations are: a) false beliefs about environmental variables and internal dynamic capacities, b) poorly defined or confused thinking in managerial terms, resulting in erroneous decisions, c) " auditory hallucinations "that become misinterpretations of reality and the generation of false paradigms about facts that will surround the strategist or businessman and will also lead to bad decisions, and d) reduction of relationship activities and the expression of emotions and inactivity, which will lead him to assume a feudal, jungle or autocratic leadership "(Pérez-Uribe, 2018, p. 5).

METHODOLOGY

As mentioned in the Introduction, one of the foundations for this research was the application of the RISE Model in 85 companies located throughout Colombian soil. A second foundation comes in the form of a descriptive research (Hernández-Sampieri, Fernández-Collado and Baptista-Lucio, 2014, p. 92) utilized to better specify the general characteristics of the convenience samples employed (Otzen, & Manterola, 2017, p.230).

Thirdly, a correlational analysis was deployed to learn the grade of association between our dependent variable (Value Creation by Innovation in the economic dimension) and the remaining 35 descriptors the RISE Model entails (Hernández-Sampieri, et al., 2014, p. 93).

Various analyses utilising multiple regression model were made. Such method is ideal for this type of research, for it allows a higher percentage of correlation and assumes the existence of many causes (independent variables, in this case, RISE Model's factors and dimensions) to pair against the analysed dependent variable (Value Creation by Innovation in the economic dimension).

Statgraphics Centurion XVI was the statistical package chosen to undergo this research, providing a total of 28 analyses that showcase innovation's decisive role in value creation, analyses from which a company's brass can develop a proper strategy.

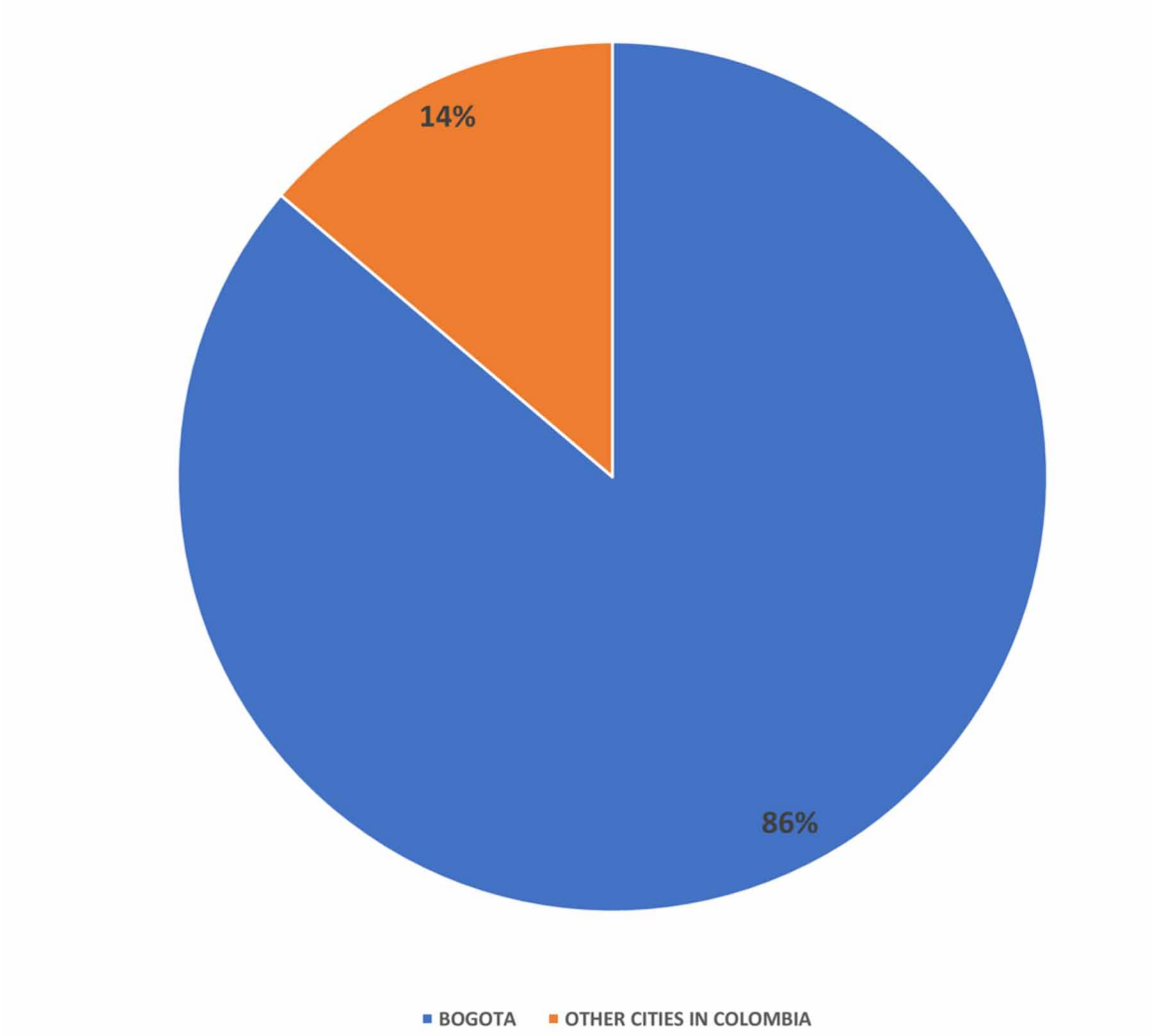
RISE MODEL FINDINGS

Two types of findings are described, descriptive and multiple regression

1. Descriptive Findings

Firstly, it was made evident that most companies analyzed are in Bogotá D.C. (Colombia's capital city) with a whopping 73, which represents 86% out of the total. The remaining 12 companies are distributed alongside Colombian territory, scattered around in cities like Armenia, Barranca de Upi- Meta, Sogamoso, Bucaramanga, Cartagena, Medellín, Pitalito-Huila, Soacha, Tame-Arauca, Tocancipá and Ubaté, cities that have completely different idiosyncrasies, climate conditions, customs and so that could not possibly be more different amongst themselves (Figure 1).

Figure 1. Company location
Source. Authors.



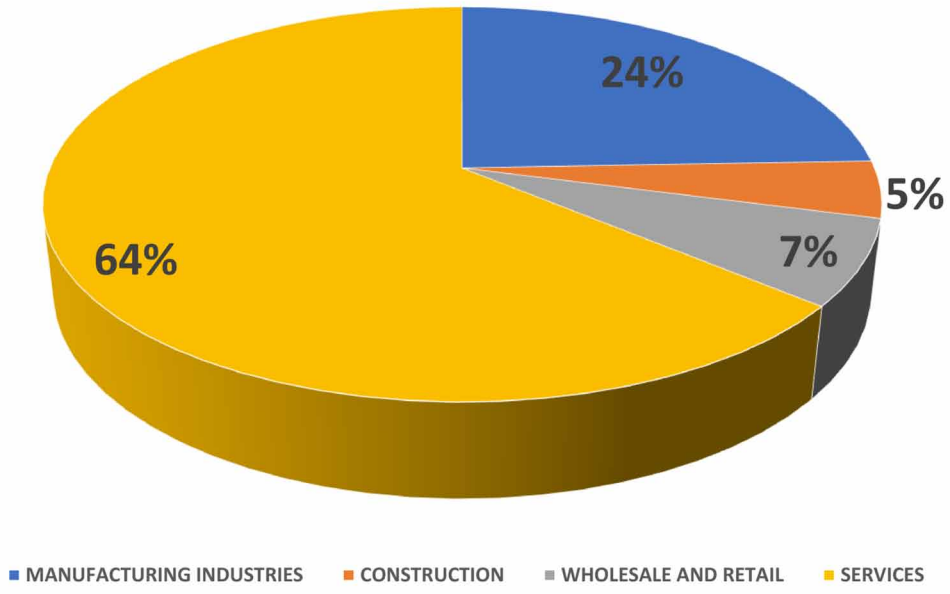
Secondly, the companies analyzed belong to different economic sectors, with 64% belonging to the services sector, 24% devoting to manufacturing, 7% wholesale and retail, and 5% construction. (Figure 2)

The companies belonging to the services sector are divided into the following activities:

- 5 in the transport and storage business
- 14 in the information & communications
- 3 finance & insurance activities
- 8 in professional, technical, and scientific consulting
- 7 in administrative and support services
- 2 in public administration & defense
- 5 in education

- 2 in artistic and recreation
- 1 in utilities (water, electricity, and gas)
- 2 classified as "other services purveyor"

Figure 2. Company economic sector
Source. Authors.



Thirdly, to classify the studied companies by their size, the authors referred to the Colombian legislation on the matter, specifically to **Law 905 of 2004**, law that draws the parameters for company classification according to number of employees, among others, as shown in table 2:

Table 2. Company classification according to law 905/2004

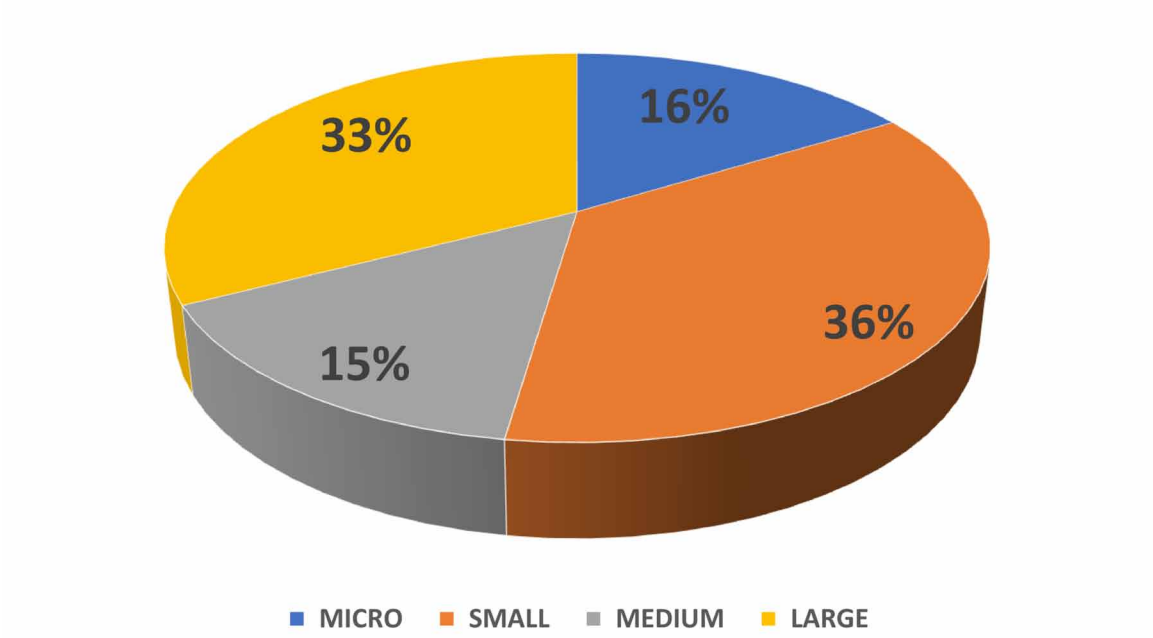
SIZE	No DE TRABAJADORES
MICRO	**Under 10**
SMALL	**11 to 50**
MEDIUM	**51 to 200**
LARGE	**201 ONWARDS**

Source. Authors, adapted from Presidencia.gov.co (2004)

As shown in figure 3, 36% out of the 85 companies examined are small, 16% medium-sized, 33% large and 15% are micro-enterprises, which makes this research very insightful for Small and Medium sized enterprises (SMEs): 67% out of the total companies assessed are such companies, ergo, we are

determining the impact of innovation in value creation in a business fabric composed in more than 65% of SMEs.

Figure 3. Company size by number of employees
Source. Authors.



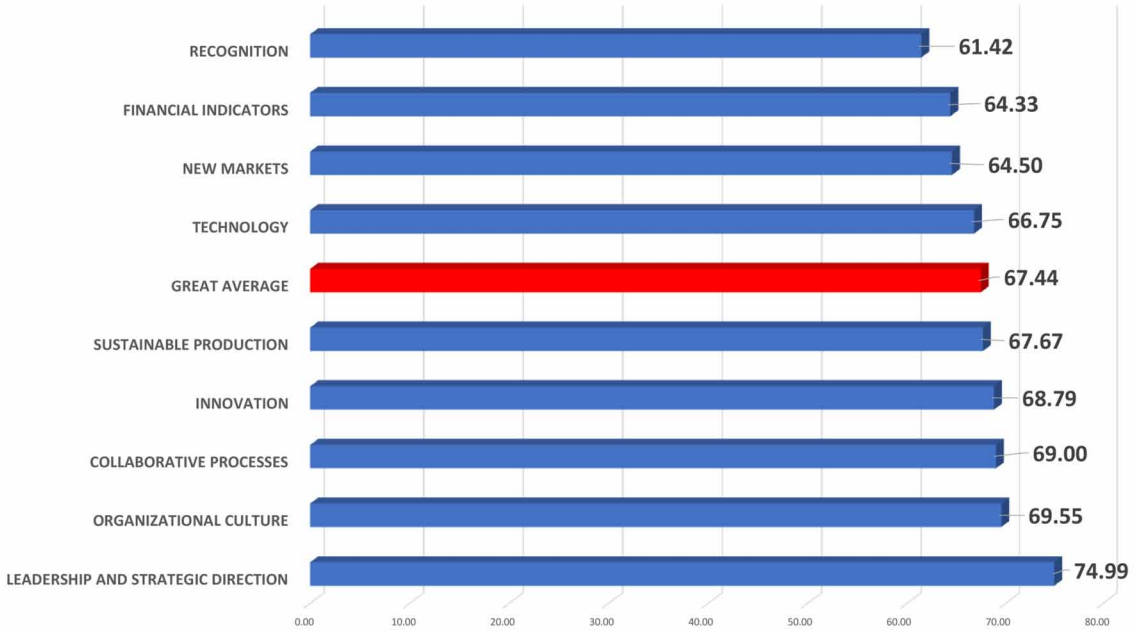
Regarding the results obtained by the companies once they were assessed by means of the RISE Model, most are in Stage 4 (Outstanding, 61 to 80%), denotating organizations that in a consolidation phase, where the market niche is highly differentiated, and the company enjoys financial stability. Results found range from 61,42% to 74,99%, as figure 4 illustrates.

2. Multiple Regression Analysis Findings

As mentioned, priorly, the statistical package Statgraphics Centurion XVI was the "weapon of choice" to conduct the analyses by means of multiple regression, carrying out a total of 26 analyses before "striking gold" in analysis No. 27, when the output finally yielded the results of adjusting a multiple regression analysis model to verify the relation between innovation's Value Creation and 9 independent variables that best explain such correlation. Thence, the resulting equation was the following:

Innovation's Value Creation = 26,1936 + 0,687045* Environmental- AUEAREn EARS[2] - 0,300978*Social.TedsoCapmovilÉtValPolíANT[3] + 0,261754* Environmental -Paradigm Shift + 0,213958*Social- Happiness at work. - 0,174967*Management-Motivation practices + 0,221097*Economic- Commercial strategy - 0,265115* Environmental - Green Markets, + 0,288262*Economic-Techtransfer - 0,163032*Management-Economic Value Added (EVA)

Figure 4. RISE model results by factors
Source. Authors.



Since the value P depicted in table 4 is less than 0,05, a statistically significant relationship between the variables with a confidence level of 95,0% is existent. The R-squared (R^2) indicates that the adjusted model expresses at a level of 67,6629% the variability of innovation's Value Creation.

It is well known that the R^2 is an appropriate statistic when comparing models with a different number of independent variables, and in this case the value was 63,8335%, with a standard deviation (σ) of 13,0544. This σ value will be useful in future research. The mean absolute deviation (MAD) was 9,63389, which is the average residual (e). Utilizing the Durbin–Watson (DW) statistic the (e) value was examined to further confirm the results' validity (Table 3).

Table 3. Multiple regression analyses results

R^2	**67,6629%**
R^2 (modified.) =	**63,8335%**
Standard Deviation (σ) =	**13,0544**
Mean absolute deviation (MAD) =	**9,63389**
Durbin–Watson (DW) statistic =	**1,81591 (P=0,1916)**
Average residual (e).1 =	**0,0767263**

Source. Authors from Statgraphics Centurion XVI

To determine if the model was prone to simplification, it is imperative to acknowledge that the highest P value from the independent variables is 0,04646, value corresponding to the "Motivation practices"

variable. Since this value is less than 0,05, that term is statistically significant with a 95,0% level of trust. This determined that none of the variables employed need to be eliminated (tables 4 and 5).

Table 4. Analysis 27 results

Parameter	**Estimate**	*Standard error*	*T Statistics*	*P-Value*
CONSTANT	26,1936	5,97675	4,38258	0,0000
Environmental- AUEAREn EARS	0,687045	0,109539	6,27215	0,0000
Social.TedsoCapmovilÉtValPolíANT	-0,300978	0,122471	-2,45753	0,0163
Environmental -Paradigm Shift	0,261754	0,0697101	3,75489	0,0003
Social- Happiness at work	0,213958	0,0858476	2,4923	0,0149
Management-Motivation practices	-0,174967	0,0864015	-2,02505	0,0464
Economic- Commercial strategy	0,221097	0,0908205	2,43444	0,0173
Environmental - Green Markets	-0,265115	0,0857228	-3,0927	0,0028
Economic-Techtransfer	0,288262	0,0730468	3,94627	0,0002
Management-Economic Value Added (EVA)	-0,163032	0,0670894	-2,43007	0,0175

Source. Authors from Statgraphics Centurion XVI

Table 5. Variance analysis

Source	*Sum of squares*	*FD*	*Middle Square*	*F-Index*	*P-Value*
Model	27100,6	9	3011,18	17,67	0,0000
Residual	12951,8	76	170,418		
Total (Corr.)	40052,4	85			

Source. Authors from Statgraphics Centurion XVI

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

Our chapter's last section will be devoted to further explain how innovation is critical for Value Creation by means of elaborating in the most important independent variables (descriptors) studied and by delving into innovation's role as a cornerstone for achieving/maintaining competitiveness in chaotic environments.

To do so, the differentiating traits and characteristics of the enterprises where the RISE model has been applied. The mentioned variables are:

1. Sustainable production factor, environmental dimension, descriptor: water control, efficient use of water, wastewater management, atmospheric emissions, and solid waste (AUEAREn EARS).
2. Leadership and strategic direction factor, social dimension, descriptor: social trend management, anti-corruption policies, and mobilization capacity (TedsoCapmovilÉtValPolíANT).
3. Organizational culture, environmental dimension, descriptor: paradigm shifts.

4. Acknowledgement and recognition, social dimension, descriptor: happiness at work and in the managerial dimension, motivation practices.
5. New markets, economic dimension, descriptor: commercial strategy; environmental dimension: green markets.
6. Technology, economic dimension, descriptor: technology transfer (TechTransfer)
7. Financial performance indicators, economic dimension, descriptor: Economic Value Added.

Water Control, Efficient Use of Water, Wastewater Management, Atmospheric Emissions, and Solid Waste. (AUEAREn EARS)

Dystopian movies like "Planet of the Apes", "Mad Max", "Terminator" "Equilibrium", among others, depict a post-apocalyptic world where humans are struggling to meet their basic needs. As we venture farther and farther into the **Third Millennium**, it is more than evident that the dystopian views were not so sci-fi, but they can vey well become a reality; furthermore, in certain parts of the Earth, those views are a harsh, inhumane, day-to-day reality for many.

Within this grim context, hydrological resources and energy sources have risen to new levels of prominence, and it is of the utmost importance that they are effectively managed in every walk of life, but especially, inward the confines of the business world.

Corporate Social Responsibility (CSR) must strive to procure a better, more rational, and coherent use of hydrological resources and to support and promote a progressive transition from fossil fuels to clean energies. Failing to do so will bring the dystopian scenarios showcased in the movies mentioned above, but without the prerogative of a Hollywood ending, for the consequences of depleting our natural resources are irreparable.

Therefore, water efficiency policies are essential, and they must be included in every single process of strategic planning of every enterprise, regardless of its size and core business (Cobacho, Cabrera & Pardo, 2008).

It is time to "walk the talk" and leave all the "talk the talk" behind. Plans for efficient management, saving and prevention of water and electric energy consumption are indispensable for having a shot at correcting the course and avoiding the dystopian scenarios. Only by means of installing strong, robust, and incorruptible policies that regulate the utilization of hydrological resources and energy sources can societies achieve a true sustainable development. Greed is passé, and companies that focus only in achieving financial success at any cost will be dated soon enough.

Therefore, for companies to attain a **sustainable success**, their upper management and owners must make all the efforts necessary to properly monitor their water and energy consumption, critical operations, maintenance, and control systems, to assess their water footprint as an indicator of the water requirements of the consumption of goods and services by a population (Martínez & Ruiz, 2016).

In addition to a proper management of hydrological resources and energy sources, it is vital to correct the course of industrial waste and they way it is disposed of. Few issues have a more negative impact in the environment, and to be overtly blunt, the industrial world has washed its hands repeatedly over it (Delgadillo, Camacho, Pérez and Andrade, 2010).

The icing on the cake comes in the form of a terrorizing concept: Global Warming. Stronger legislation applicable to the field of greenhouse gas emissions by the companies must be applied, legislation that makes companies and their upper tiers liable. Greenhouse gas emissions must be quantified by all

companies, and they must release a regular report of their carbon footprint (García, Corredor, Calderón & Gómez, 2013).

All these measures must be embraced, not only as monitoring and assessment tools, but also as cornerstones for achieving a sustainable competitiveness (Mas-Alique, Herraez-Garrido and Muñoz-Jimenez, 2014; Gaitán, Cancino & Behrentz, 2007). After all, we did say that greed is passé!

New Social Trends Management, Anti-Corruption Policies, and Mobilization Capacity (TedsoCapmovilÉtValPolíANT)

Never in the history of mankind have we witnessed an era of deep, resounding, and radical transformations and changes. During the last two decades the "social being" has undergone a complete makeover (Mercado, 2011, p 62). This fact entails a monumental challenge of upper management, and the best way to meet it is by constantly seeking advice and consulting specialized information. Hiring business consultants, attending congresses, organizing conferences, assisting to specialized symposiums and most importantly, procure an organization culture that evolves around trust, ethics, and the creation and dissemination of information.

The capacity of mobilizing a crowd is intimately related with leadership. Throughout history, we have witnessed how leaders have summoned their followers to meet the most insurmountable of challenges. From Moses in the Red Sea to Gandhi and his infamous hunger strikes, from Julius Caesar to Simón Bolívar and from Jesus of Nazareth to MLK, mankind's greatest luminaries have all possessed a unique, yet powerful, mobilization capacity. This capacity when properly utilized is a conception from which a social and relational phenomenon can be derived, aiming at the following purposes: 1] enabling and empowering a new, collective vision that is born by means of Socratic maieutic amongst all organization stakeholders. 2] the system and its subsystems must be adaptable to an ever-environment, and this can only be attained by making the decision-making power more and more democratic. 3] homogenization must be damned! Diversity must be mandatory, hence upper management must strive to understand that each group is unique and thus will require training that is tailored to their knowledges and skills (Contreras and Castro, 2013, p. 73). In this regard, management must be focused on creating a harmonic ambience, were creativity, diversity and honesty must be pursued with a vengeance, for it is a leader's duty to promote, proclaim and still a pristine and unstained behavior, but she/he must always remember that such behavior must begin at the top of the hierarchy. There is no better way to lead than by example. (Andrade, 2017)

Here are some additional recommendations:

- Conceive future situations and evaluate their occurrence probability, alongside a long-term vision, supported by a validation system, a simulation, or a mathematical model as a planning tool.
    - Achieve a total alignment of the enterprise's planning requirements and those of its labor force.
    - Deploy a system for the company's objectives. This should be a working tool for all employees.
    - Develop a programme so that the fulfillment of the business values becomes not only a motivation factor, but a source of stability and commitment from and for its members.
- Define, document, and make explicit the responsibilities of the company's directives (Board of Directors, Family counsel) to all parties interested.

- With indicators show the role and involvement of the business' management as a leader in the creation, promotion, and maintenance of a harmonious work culture.
- Make explicit throughout the whole company the activities that promote the development of leadership in all levels.
- With indicators make explicit the results of the diagnosis and improvements of a management culture.
- With indicators reveal the results of the activities that promote the improvement of each person's handling of authority and autonomy in their job.
- Develop strategies to consolidate work teams that help making the achievement of the company's objectives easier.
- Put into practice a process to develop formal and manifest commitments of the management to quickly respond and satisfy the employee's initiatives.
- Create and carry out development plans for the workers that show their results in their everyday work in the business.
- Set up programs to prepare employees that are soon to be retired.
- Employ referencing and comparison methods to recognize and contrast your company's management policies and practices with the best national and international development practices. Use this information when engaging in decision-making processes.
- Create, implement, and give feedback to a process of acknowledgment for the tasks that each of the individuals and groups perform and that contribute to the achievement of the company's objectives.
- Come up with methods to analyze and properly tackle the feelings of rootlessness, angst, and stress that some workers might have because of their work environment.
- Use activities to promote respect and human dignity among employees and collaborators of the company.

Paradigm Shifts

Galati (2011, p.3) defines paradigms as "a model or a pattern that determine people's beliefs, attitudes and overall behaviors. Paradigms can also refer to a rule change."

Paradigms condition the way we perceive reality. They differ from culture to culture, from city to city, region to region, state to state, religion to religion, you name it. Traditional paradigms such as marriage and offspring, were forged throughout entire generations, institutionalizing a preconceived idea that a human being's life will not be lived to the fullest if she or he does not get married and have children. That was a universally accepted paradigm for "Baby Boomers", but it is no longer the case for Millennials and Centennials (Mendoza de Graterol, Mendoza, Mendoza de Lorbes and Graterol, 2008). Holding to one's paradigms like a paratrooper holds to his parachute goes against innovation! Therefore, it is mandatory to pursue a more flexible frame of mind, one that pursues forging dynamic capacities for innovation.

Garzon (2015, cited by Morales, Ortiz, Duque, and Plata 2016), explains three (3) trends of thought that ought to help organizations and their respective management procure the mentioned capacities. These are:

1. Implement a new, fresh, and innovative knowledge management model aimed at modifying the existing routines, thus generating new value creation strategies.

2. Innovation does not work if it does not transcend the rhetoric stage. It must solve a specific problem or circumstance, providing an organization with new solutions that can be transformed into actions.
3. A contingent approach that allows meeting changes in exogen market variables with an organization's internal capacities.

In order to really change, to really produce paradigm shifts, a company must strive to maintain an organizational culture were sustainability and innovation walk hand in hand and were these are not aimed at pleasing the external shareholders, but first and foremost, they must be procured at the internal stakeholders, such as employees (Carro-Suárez, Sarmiento-Paredes, and Rosano-Ortega, 2017).

Happiness at Work and Motivation

Pérez - Uribe (2012) has explained that many approximations to the concept "happiness at work" have been focusing solely on the hedonic experience of pleasure. Other researchers aim at the concept of **Eudaimonia**, concept that involves learning, development, growth, autonomy, and self-fulfillment. Regarding eudaimonia, the author affirms that happiness at work has three (3) levels:

1. A transition level, involving constructs such as satisfaction at work, temporary affection, a state of fluidity, state of mind, emotional state, commitment, enjoying the task at hand and intrinsic motivation.
2. A personal level in which commitment, disposition and affection towards the organization are the constructs observed.
3. A collective level in which morale and collective satisfaction, group motivation and state of mind are the constructs ascertained.

Following the same train of thought, Fischer (2003) proposes a three (3) foci manner for measuring satisfaction in the workplace:

1. The task at hand itself.
2. The task at hand considering contextual characteristics such as compensation, colleagues and co-workers, supervision, and the work environment.
3. Considering the organization in its entirety; a holistic approach.

Chekola (2007) goes further and integrates the hedonic aspects with the eudemonic ones, proposing a hypothesis that states that is by virtue of achieving a synergy amongst these two concepts that a superior productive level can be obtained.

Is in this regard that Pérez-Uribe (2012) claims that true happiness and satisfaction at work cannot be attained if one of the two is missing, for hedonic behavior is related intimately with satisfaction at work whereas eudemonic behavior is linked with having a purpose, growth and achieving a social significance and importance.

New Markets and Green Economy

Ferrer (2016) explains that a commercial strategy is composed by all the actions involving designing, marketing, and distribution that when properly executed, will allow an organization to fulfill its sales budget, which in turn will permit the company to enjoy a vigorous financial health.

Thence, defining objectives and then designing the commercial strategy to best procure them is Strategic Direction 101, and they compose the basic genesis of any profit-seeking organization. Pérez and Rodríguez (2015) elucidate that beginning any commercial actions that are not circumscribed in a commercial strategy is very much like going on an international trip without ticket reserves and without a set destination; you might wind up in the middle of nowhere…that is if you ever get out of your local airport!

A profound and rigorous market research is the cornerstone of any commercial strategy. Esteban and Fernández (2017) claim that such research must include a thorough investigation regarding competition, market geography, and market trends.

Competition is an accurate thermometer; it always has been. Therefore, it is of the utmost importance to detailed it in the most acute of fashions. Furthermore, McQuarrie (2015) tells us that just as important to know your competition is to know the terrain where the commercial activities are going to take place. Napoleon was a master of this art!

Nowadays, one of the key differencing factors that can secure a competitive advantage, is focusing on green markets. This is especially true when entering new markets (Bang, Joshi, and Singh, 2016). Green markets are those where customers have a distinct preference for products and services hailing from organizations working under the commandments of the **Circular Economy Philosophy** and are willing (and able, as Bob Marley says!) to pay a little more for them.

But the concept of **green markets** does not circumscribe itself to organizations whose products and services that are environmentally friendly; **green jobs** are a must also. Mata (2012) defines green jobs as those posts where workers are not only contributing to the environment via their daily toil, but their jobs are contributing to their physical and mental health as well, thus engaging in a lovely virtuous circle.

We must not only aim at environmentally friendly products and services, but also at environmentally friendly jobs. There is a deep, intimate relationship **between Green Buildings, Alternative Fuels** and **Green Workers** (Araújo, Cardoso, Fraiz & Araújo, 2018).

Technology Transfer

From a purely scientific point of view, the key questions regarding the relation between technology and territorial/regional development are three (3):

1. How can regional innovation and its technological capacities be quantified?
2. Which factors are the determining ones regarding innovation?
3. How can the subpar technological capacities be enhanced, leading to a greater competitivity and growth? (Guerrero & Seró, 1999).

Many at time, regional or local governments do not have enough financial muscle to secure and/or support the economic growth of certain territories. Budgets are meagre, corruption runs wild, other priorities are determined (health, education, housing, water and sewage systems, etc.) and more often

than not, obtuse-minded politicians fail to see the co-relation between securing economic growth and overall regional welfare. Or maybe they do see the connection, but that is not the real reason behind their being there. Hence, private enterprises play a crucial role in purveying such regions with the proper technology transfer and adoption that can help attain sustainability (Antolín, 2003).

Consequently, it is overbearing to properly characterize the economic dimension of the technology and innovation factor within the **RISE MODEL**. A company must not just focus its interest on technology as a tool provider for management and competitiveness, but rather as a powerful device that allows the powers that be to develop a prospective vision that will secure the company's longevity.

Economic Value Added (EVA)

The term Economic Value Added (EVA) was devised by management consulting firm Stern Value Management, originally incorporated as Stern Stewart & Co. EVA is a measure of a company's financial performance based on the residual wealth calculated by deducting its cost of capital from its operating profit, adjusted for taxes on a cash basis. EVA can also be referred to as economic profit, as it attempts to capture the true economic profit of a company (Alvarado, 2006).

Within the realms of the financial world, value creation is conceived as a decision regarding a share and/or an investment, that returns a profit that is superior to the initial invested amount. EVA is the incremental difference in the rate of return (RoR) over a company's cost of capital. Essentially, it is used to measure the value a company generates from funds invested in it. If a company's EVA is negative, it means the company is not generating value from the funds invested into the business. Conversely, a positive EVA shows a company is producing value from the funds invested in it (Alvarado, 2006, p.11). Value is created when the investment pays a higher RoR than the opportunity cost of capital (Copeland, Murrin & Koller, 2004).

Value Creation demands a series of activities that lead to the generation of a higher profitability for the shareholder and the proprietors. It must be higher than any other comparable alternative (Laniado, 2002).

EVA is an especially useful measure to assess management performance, specially within companies that are not listed on the Stock Market. Maximizing EVA value is synonymous with maximizing the company's value; hence, it is also synonymous with complying with the fiduciary responsibility CEOs, CFOs, COOs, and other company brass must meet maximizing shareholder value (Alvarado, 2006).

There is Just No Denying it: Innovation is the New Black

All through this chapter is has been emphasized that innovation is one of the factors that has a great impact in an organization's genesis, and as it was made evident by the nature of the companies analyzed, in SMEs competitiveness. For any organization, whether non-profit, public, private, small, medium, large, or micro, to attain sustainability, profitability and longevity in this time and age it is paramount to evidence innovation in all company processes. But that is not going to occur by happenstance. A gigantic, conscious effort must be made to achieve such ambitious goals. Founding members, upper-management and executives must take the first step, but human talent must follow suit.

Very much like the ancient proverb states:

"Live by the sword, die by the sword"

Companies can live by innovation, but they can also die from it, or rather by the lack of it. Innovation is the backbone of today's competitiveness and Value Creation. By promoting innovation, a company is developing a whole new set of skills, skills which allow management to thoroughly understand and keep up with the times. It is particularly important to understand that innovation cannot be perceived as a fad, nor can it be considered as a policy upper management wants to install within a certain company. Innovation must be thought of as a way of life, a philosophy, and it must be deeply embedded in an organization's culture, so that every area is imbued with an **"innovation philosophy."**

Industrialized countries adopted strong government policies that stimulate innovation many years ago, during the 1940s to be precise. During WWII and in its aftermath, countries like the US, Japan, the former USRR, Germany and England began investing important percentages of their GDP in research and development. Few events in human history have fueled mankind's interest in innovation more than wars; that is sad, but it is true. WWII was a brutal, bloody, gory event that should not be glorified, and we all must pray and hope that such an unfortunate event never repeats itself. Nonetheless, it did give a decisive boost for research, development, and innovation (R+D+i) (Ramírez-Salazar, Salcedo-Perez and Castañeda, 2021).

Just as innovation must be the cornerstone in today's organizations, HR management must become its most devoted advocate. Innovation's impact in competitiveness has been well documented and revised, but it is quite easy to lose sight of a remarkably simple, but transcendent truth: human beings are knowledge's ultimate vehicle. It is by means of human talent that knowledge is created, stored, and disseminated. Without people, there is no innovation.

Therefore, innovation is a philosophy, but also an ongoing, unstoppable learning process that properly channeled will allow any organization to thrive and attain extraordinary benefits in a sustainable fashion. On this basis, organizations must try ridiculously hard to conceive and implement as much organizational and human innovations as they can, for competitiveness it is only obtained, and furthermore, kept, through this constant process.

That is why the lagging evident in SMEs all through Latin-America must force policymakers and the powers that be to take matters into their hands, to push the panic-button, for the longer it takes for SMEs to take that 180-degree turn, the greater the danger of going out of business they will face.

An economy with a with high a rate of SMEs' mortality is a profoundly serious and delicate matter. Very seldom is the importance and impact of SMEs showcased and SMEs' welfare should be considered a priority in any economic policy. For example, in Colombia, much of the business universe is composed of Micro, small and medium-sized enterprises (MSMEs), representing 96% of the Colombian business universe, and generating 63% of total job posts, 45% of the manufacturing production, 40% of total wages and 37% of the added value (Tovar Rojas, Pérez-Uribe and Ocampo-Guzmán, 2015).

The 180 degrees must be fueled by innovation, leading a lagging company into a state of sophistication in its product/service offering and in its competitive position. Tovar Rojas, *et al.,* (2015) provide some tips as to how a SME can fully embrace a transformation with innovation as its harbinger:

- Have outside talent related to the inside talent to develop the knowledge, experience and skills required to undertake sustainable innovation activities. The collaborators are joined by open innovation networks and contribute to the sustainable innovation processes in the organization.
- Develop a process based on values looking for an economic, social, and environmental balance allowing the ideas of the workers to become projects, products and services of the company and

considering the development of new products and/or services from an integral sustainability point of view. The company is recognized as a sustainable innovation leader in its sector.

- Support the company's innovating activity in the interaction and contribution of all its groups of interest with fairness and justice, developing the ability to systematically replicate innovation processes.
- Establish a management system of the innovating activity with the relevant process and result indicators, in economic, social, and environmental terms. For this purpose, the company has allotted resources to be specifically and exclusively used in the innovation activities.
- Control the mechanisms, instruments, and regulations to protect the results of the innovating activity and define policies and strategies to protect its innovations.
- Permanently search for new ways of sustainable integral development for the different groups of interest and control the abilities to generate innovations in products and services, production processes, marketing ways, management systems and business models.
- Control know-how in an integral manner to achieve an operation friendly to the environment and the community. For this purpose, it establishes a technological action plan according to the strategy to assure the company's sustainability, and it anticipates to technological changes and implements prospective actions to build its own sustainability.

Some Final Thoughts

Innovation might be the cornerstone in a company's competitiveness but let us all remember that it is through its human talent that innovation can be fully appreciated and used to its maximum potential, and at the center of it all lies the manager. It is through its leadership that companies can undergo a successful transformation process, becoming a modern, competitive, and sustainable organization.

The types of scenarios studied throughout this chapter make clear that management is a company's cornerstone, and the central pivot of the company's genesis. He/she constitutes the corporate image to the outside world, and the natural leader within the company, hence becoming the epicenter of the organization's dynamics. It is their obligation to transform themselves first if they are to lead a transformation process within their organizations.

When the manager-leader becomes the axis upon which the company rotates all the strategic decisions depend on him/her, and the management approach utilized will be a decisive factor on the organizational climate the company has, as well as the company's relationship with its external environment.

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KEY TERMS AND DEFINITIONS

Disruption: A disruption is an interruption or break with the traditional way of executing something.

Economic Value Added (EVA): It is a model that quantifies the creation of value that has occurred in a company during a certain period of time.

Innovation: Conception and implementation of significant changes in the product, process, marketing, or organization of the company with the purpose of improving results.

RISE: Route of innovation and sustainability for enterprises, it is a model that allows to measure the level of innovation and sustainability of organizations in the light of nine factors, four dimensions and thirty-six variables, on a scale from 0 to 100%. It was created by the research group in management of large, small, and medium-sized companies of the EAN University in Bogota, Colombia.

ENDNOTES

1 Research group devoted to the study of management in Micro, Small, Medium, and Large enterprises.

2 The variable "AUEAREn EARS" was coined to explain water control, efficient use of water, wastewater management, atmospheric emissions, and solid waste.

3 The variable "TedsoCapmovilÉtValPolíANT" was coined to explain social trend management, anti-corruption policies, and mobilization capacity.

Chapter 2
Incidence of Organizational Culture in Digital Transformation Projects

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ABSTRACT

Organizational culture can be defined as the set of characteristics that distinguish one organization from another through the establishment of norms and values that describe the behavior of the people who work there. Little by little, organizations have realized that digital transformation goes far beyond a simple technological change; it requires the alignment of organizational strategy, people, culture, mentality, the development of human talent, and leadership. The purpose of this research work is to identify, through the application of a correlational statistical model, the impact of the organizational culture on the success of digital transformation projects.

INTRODUCTION

Under the current scenario of economic uncertainty, little by little more companies, from different industries, sectors and sizes, have become interested in incorporating technological tools in their organizational processes in order to improve their competitiveness and position in the market (Lee, 2021). The concept of digital transformation is increasingly common in the lexicon of managers, who have understood the importance of integrating digital capabilities into their organizational structures in order to achieve high

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rates of efficiency, quality and adequate risk management. This has a positive impact on the generation of value in the different market segments (Elia, Margherita, & Passiante, 2020).

Reducing uncertainty through proper data management allows companies to develop statistical models capable of predicting market behavior, anticipating the needs of their customers. In this way, innovation in products and services is done with greater precision, improving the management of resources and the profitability of companies (Nam, 2019).

However, digital transformation goes far beyond technology, its real focus is oriented to support of the organizational strategy, improving the processes and the operation of the companies. Deploying technology without a clear purpose can backfire for companies. Therefore, organizational culture plays a determining role in the execution of digital transformation projects; because people, with their capacities and limitations, are the ones who allow the correct adaptation of technological tools. Undoubtedly, an open and purposeful organizational culture, oriented to change, innovation and teamwork, is the most appropriate environment to carry out projects of this nature (Spencer, 2018).

This research work aims to identify, through the application of a correlational statistical model, the impact of the organizational culture on the success of digital transformation projects. For its development, 270 managers of small and medium-sized companies belonging to various sectors and industries from Bogotá have been surveyed, who were asked about their perception of the culture of their organizations and how it may or may not assist the execution of a digital transformation project. In addition, the success of digital transformation projects was defined in two perspectives: in the first instance, from the correct management of the project's life cycle; and in the second instance from the appropriation made by the different interest groups of the results achieved with the Project. In this sense, the following research question is proposed:

RQ: Can the organizational culture be defined based on specific attributes in such a way that it positively affects the success of digital transformation projects?

THEORETICAL FRAMEWORK

This research is framed from the analysis of three fundamental concepts: organizational culture; digital transformation and project success. In this sense, from the theoretical approach, these three concepts have been defined as key support in the process of technological adoption in organizations. In this way, the three of them will be described:

Organizational Culture

Organizational culture can be defined as the set of characteristics that distinguishes one organization from another, through the establishment of norms and values that describe the behavior of the people who work there. Each organization has its own character and personality. This is derived from its culture, which allows it to understand and face its environment with a greater or lesser degree of adaptation. Organizational culture is expressed in the way operating activities are carried out from the relationship of the different processes, in addition to the existence of shared norms and values, the collective understanding of reality, attitudes towards change, willingness to take risk and commitment to common purpose (Metwally, Ruiz-Palomino, Metwally, & Gartzia, 2019).

Ehtesham & Ahmad (2011) mention that the organizational culture has a significant and positive influence on management practices, reflecting on the performance of workers and the solid financial growth of companies. The organizational culture has a strong influence in the short-term accomplishment of the tasks and in the long term it can guarantee the survival of the companies. In this sense, Schneider (1975) found that organizational culture affects employees in their work behavior. In addition, organizational culture can play an important role in the successful implementation of technology, since it affects how employees perceive the reality of companies.

Organizational culture is a subject that is widely studied, this is how various models describe the variables and approaches that define it. In his proposal, Harrison (1972) exposes the culture based on the organizational climate, identifying four types of culture: [1] power oriented; [2] function oriented; [3] work oriented and [4] people oriented. Table 1 describes the characteristics of each of them.

Table 1. Culture based in organizational climate

Culture	Characteristics
Power oriented	• Exercise the maximum possible power both externally and internally. • Intense focus on dominating, influencing and controlling. • Internally, it is desirable to maintain absolute control of the subordinates. • Organizational climate of high competition among collaborators, no matter the position of the other party. • Externally the organization is highly competitive, focused on goals and results, no matter at which cost
Function oriented	• Oriented towards the role performed by each person. • They focus on the order and rationality that gives the legitimacy of the rules and procedures. Legality and responsibility. There is hierarchy and status. Roles clearly defined. • Stability, safety and formality are evident. • Loyalty and legitimacy are valued.
Work oriented	• Focus on results. Achievement of the established goal and overcoming obstacles are valued. • Organizational structures based on projects: efficiency and effectiveness. • Flexible structures that react quickly to context changes. • Experience is valued. Employees are linked to different projects to take advantage of their experience and technical knowledge.
People oriented	• Workers' well-being prevails • The responsibility of the organization is to provide a reasonable livelihood for its workers. • Tasks are assigned based on the worker's personal preferences. Learning and progress is the ideal. • The company seeks to stay in the market rather than grow and be the best.

Source: Own elaboration based on Harrison's proposal (1972).

Peter & Waterman (1984) present McKinsey's Framework 7-S. They set out in their proposal a model of seven components: shared values; strategy, structure, systems, skills, people and style. In addition, in their study they identified that the key to business success is supported by the organizational development of eight attributes: emphasis on the action; proximity to the customer; autonomy and initiative; productivity through people; clear values and achievement orientation; focus on the market segment; reduced staff; simple organizational structure. These attributes are kept in line with the organizational culture. Depending on their degree of development and integration, one can speak of strong or successful or weak cultures or with a tendency to fail. Table 2 describes each one of these attributes:

Table 2. McKinsey's 7-S model

Attribute	Business focus
Emphasis on action	Experimentation is privileged. They are analytical in the way of making decisions. Nevertheless, they prefer to move onto the playing field rather than bear decisions about the available information. The experience is much more valuable.
Proximity to the costumer	Permanent listening to the client to obtain information, needs and possible new product lines.
Autonomy and initiative	Leadership and innovation within the organization are encouraged. Controlled risk taking is supported. Internal competition is encouraged.
Productivity through people	Workers are the primary source of productivity, quality and positioning. Efficiency and effectiveness.
defined values and achievement orientation	The organizational culture is supported by a clear understanding of all workers and a high commitment to the company based on a value system.
Focus on the market segment	They remain in their market segment, diversify through new business lines that serve the target population.
Reduced staff	The number of workers is the necessary, neither more nor less, to function. The number of members of middle and senior management is the necessary for the leadership and coordination of activities.
Simple organizational structure	Organizational structures are light and adapt to the new needs of the environment quickly. Decision making is not centralized, despite the size of the organization. The key is organizational values.

Source: Own elaboration based on Peter & Waterman's proposal (1984)

On the other hand, Deal & Kennedy (1985) conclude because of their research that successful companies are those in which beliefs are permanently present within the organization. To achieve organizational success, mechanisms must be developed that allow workers to be rewarded for their adherence to the central aspects of the culture and for how these are maintained and reinforced over time. People are the basis of companies to achieve success through the strengthening of the organizational culture. Likewise, the authors identify five elements that describe organizational culture:

- The business environment and key success factors: what the organization must do very well to be successful.
- The values of the leader: beliefs and basic concepts of the organization. They define the behaviors that are judged as keys to success.
- The visionaries or heroes who create the culture: people who personify the values of the organizational culture. They are the role model for other workers.
- Rites and rituals: they are the manifestation of the organizational culture.
- Cultural network: they are the organizational communication models.

The model also includes four typologies that classify organizational culture: macho culture; hard work culture; bet and win culture; and process culture. Similarly, two have identified that frame these cultural typologies: the level of risk in the environment and the speed of feedback or knowledge of results. Table 3 presents each of the culture typologies exposed by the authors:

In this sense, Ansoff (1968) argues that organizational culture is tied to the evolution of the company, its dissipation to change and taking risks. Likewise, five attributes are established that distinguish the culture of an organization: relationship of the company with its environment, development of alternatives

Table 3. Model of the four types of organizational culture

Type	Description
Macho culture	Organizations that take high risks. Automatic response to problems that arise. The heroes are aggressive and individualistic, tough character and of permanent fight.
Hard work culture	Organizations that take little risk. They respond immediately to the needs of the environment. Teamwork and a focus on results are encouraged. Constant and teamwork is valued above all else. Heroes are teams, rather than star individuals. The personality of the workers stands out for their commitment and tenacity.
Bet and win culture	Organizations that assume high risk, however, show great slowness in the knowledge of the results. Decision-making is in highly complex environments and its consequences will be seen in the long term. Heroes are stubborn and competent people, with great maturity, showing a conservative and hierarchical behavior, respecting seniority and experience.
Process culture	Organizations that do not take any risk and with very slow feedback. They are predictable and continuous in their actions. Its heroes are orderly, cautious and formalistic people, with a conservative and hierarchical behavior.

Source: Own elaboration based on Deal & Kennedy's proposal (1985)

for action, focus on change, organizational evolution and tendency to risk. Based on these attributes, five types of culture are defined: stable, reactive, forward-looking, exploratory - creative. Table 4 describes each one of the typologies exposed by the author:

Table 4. Evolutive model of companies

Culture	Description
Stable culture	Introverted culture, values tradition and the past, rejects changes, conservative, rejects risk. Repetitive operations.
Reactive culture	Introverted culture, adapts to change, accepts risk with less impact, focuses on the present, values the experience of the past. Looks for efficiency.
Forward- looking culture	It anticipates threats and opportunities, anticipate change, accept risks that it considers having the ability to manage. Synergistic effectiveness.
Exploratory- creative culture	Extroverted culture, constantly looking for change, prone to taking risks, values the cost-opportunity relationship. Global effectiveness.

Source: Own elaboration based on Ansoff's proposal (1968)

Sethia & Glinow Von (1985) developed an organizational culture's model based on rewards. There are four types of rewards for authors: financial, content of work to be done, growth in the organization, and improvement of status. Likewise, it distinguishes extrinsic skills not associated with work and intrinsic skills associated with work. Based on this proposal, they identify four types of culture: apathetic, concerned, demanding and inclusive. Table 5 describes these types of organizational culture:

Digital Transformation

Little by little, organizations have realized that digital transformation goes far beyond a simple technological change, it requires the alignment of organizational strategy, people, culture, mentality, the development of human talent and leadership (Goran, LaBerge, & Srinivasan, 2017). Investment in new technologies

Table 5. Organizational culture based on reward's system

Culture	Description
Apathetic	The leadership style is disinterested, the people and their results do not matter. There is no commitment to the organization. There is high uncertainty within the company regarding the near future. Workers have low morale. The sustainability of the company is put at risk over time.
Concerned	Permanent search for the well-being of workers regardless of their performance. High degree of paternalism. Rewards are based on seniority or hierarchical position rather than achievement of results.
Demanding	High achievement orientation. Success and results are important, more than people. The law of the strongest prevails. Highly competitive organizations. Rewards are awarded based on results.
Inclusive	High interest in people and the results they are capable of achieving. They do not have a paternalistic approach; people are valued based on the results of meaningful work. The effort must contribute to the results of the company.

Source: Own elaboration based on Sethia & Glinow Von's proposal (1985)

should positively impact the structure of organizations, improving operations and strengthening business models and therefore the competitiveness of companies, this will allow to deliver greater value to customers and transform economies (Zaoui & Souissi, 2020).

Gong & Ribiere (2020) in their research they unify the definition of the concept of digital transformation presenting it as:

*A process of fundamental change, made possible by the innovative use of digital technologies, accompanied by the strategic leverage of key resources and capabilities, with the aim of radically improving an entity * and redefining its value proposition for its stakeholders. (* An entity could be an organization, a business network, an industry or a society). (P. 12)*

Digital transformation processes not only incorporate technology, on the contrary, but the entire organization must also be involved in this transformation. Senior management leadership is one of the critical success factors. All employees must share the same vision, understanding that markets and the business context are changing faster and faster and the need to adapt to survive arises. One of the great challenges that organizations must face is to motivate and train their workers to assume the commitment of transformation, understanding it as an opportunity to improve the competitiveness of companies, and derived from this their quality of life, more than an occupational hazard. The increase in productivity, the increase in the level of innovation, cost efficiency, agility, improvement in the quality of work and reduction of risks due to errors, are among others the benefits that digital transformation brings. (Lucy, 2017).

Zaoui & Souissi (2020) define in their research three necessary phases that frame a digital transformation process:

- The evaluation of the digital transformation: in this stage it is intended to evaluate the existing digital state of the company. The evaluation must be multidimensional, this will allow knowing the digital maturity of the organization, to subsequently evaluate the efficiency of the transformed processes from technology. This stage will also make it possible to sensitize the different stakeholder groups to the committed and agile approach of the digital transformation process.

- Define the strategic orientation of the digital transformation of the company by defining clear and valuable objectives: in this stage the aim is to align the strategy with technology by clearly defining objectives and goals that add value to the organization. Two main variables must be considered: the size of the company and its activity. This is a very important stage for the successful completion of the transformation process.
- - Implementing digital transformation: implementation is the most concrete phase of the entire transformation project. The change will be felt and visible to different stakeholders. How quickly this change will take place depends on how motivated and committed stakeholders are to the collective cause of digitization.

Success of the Projects

Baccarini (2005) describes the success of a project from the differentiation of two main concepts. In the first instance, the management of the project, for which success is achieved by complying with the triple restriction: scope, time and cost. On the other hand, the quality of the expected product, which marks the success, if the client's expectations are met compared to the result obtained. On the other hand, Procaccino and Verner (2006), propose that a technological nature project is successful when a product is delivered that meets the requirements identified with the client and users. In addition, it works as planned, being a synonym of quality and personal fulfillment for its creators.

Linberg (2000) proposes in his research some elements that must be controlled to increase the probability of success of a project: effective leadership, favorable organizational climate, realistic technological requirements, realistic time estimates, availability of resources and synergy among the members of the team of the project. Likewise, it exposes the factors that lead to failure in technological projects: estimation and activity scheduling failures; flaws in the specification of requirements; communication failures with the client; poor organizational structure, lack of leadership, lack of support from the management level, clashes between the members of the project team, inadequate use of technical methods, inadequate allocation of resources, failures in the management and monitoring of the project.

Regarding the organizational strategy, Patanakul and Shenhar (2012) emphasize that this factor cannot be ignored when undertaking a project, since it is the way to guarantee the generation of value for the different stakeholder groups. In their research, the authors propose three components of the strategy that should be considered in the planning process of a project: 1) Perspective - why: the background of the business, the business objectives and the strategic concept; 2) Position - what: product definition, competitive advantage, success or failure criteria are considered. 3) Efficiency - What for: The benefits to be obtained with the project are considered.

Finally, Pereira, Cerpa and Rivas (2010), In their exploratory study, they conclude that there are seven categories of risk that can affect the success of a project: 1)Poor management practices and lack of support from senior management; 2) The lack of involvement of the end user in any of the phases of the project life cycle; 3) Inadequate specification of requirements; 4) Poor estimation of effort and activities; 5) the low experience of the project manager; 6) The low experience of the technical team; 7) Low or bad application of project execution and management methodologies.

SELECTION OF VARIABLES, THEORETICAL MODEL AND HYPOTHESIS

Based on consulted authors, a selection of common variables that allow a theoretical description of the phenomenon studied was made, to later explain, through a statistical model, the existing cause - effect relationship. Table 6 shows the relationship of the variables selected from the postulates expressed by the authors:

Table 6. Relationship matrix: variables- authors

Variable	Harrison	Peter & Waterman	Deal & Kennedy	Ansoff	Sethia & GlinowVon	Gong & Ribiere	Zaoui & Souissi
Organizational strategy	x	x	x		x	x	x
Inclusive leadership	x	x		x	x	x	
Commitment focused on values	x	x	x	x	x	x	x
Flexible organizational structure	x	x	x	x	x	x	x
Understanding the environment and its risks	x	x	x	x	x		x
Efficient adaptation to change	x	x	x	x	x	x	x
Continuous innovation	x	x	x	x	x	x	x
Orientation to results	x	x	x	x		x	

Source: Own elaboration based on the consulted authors

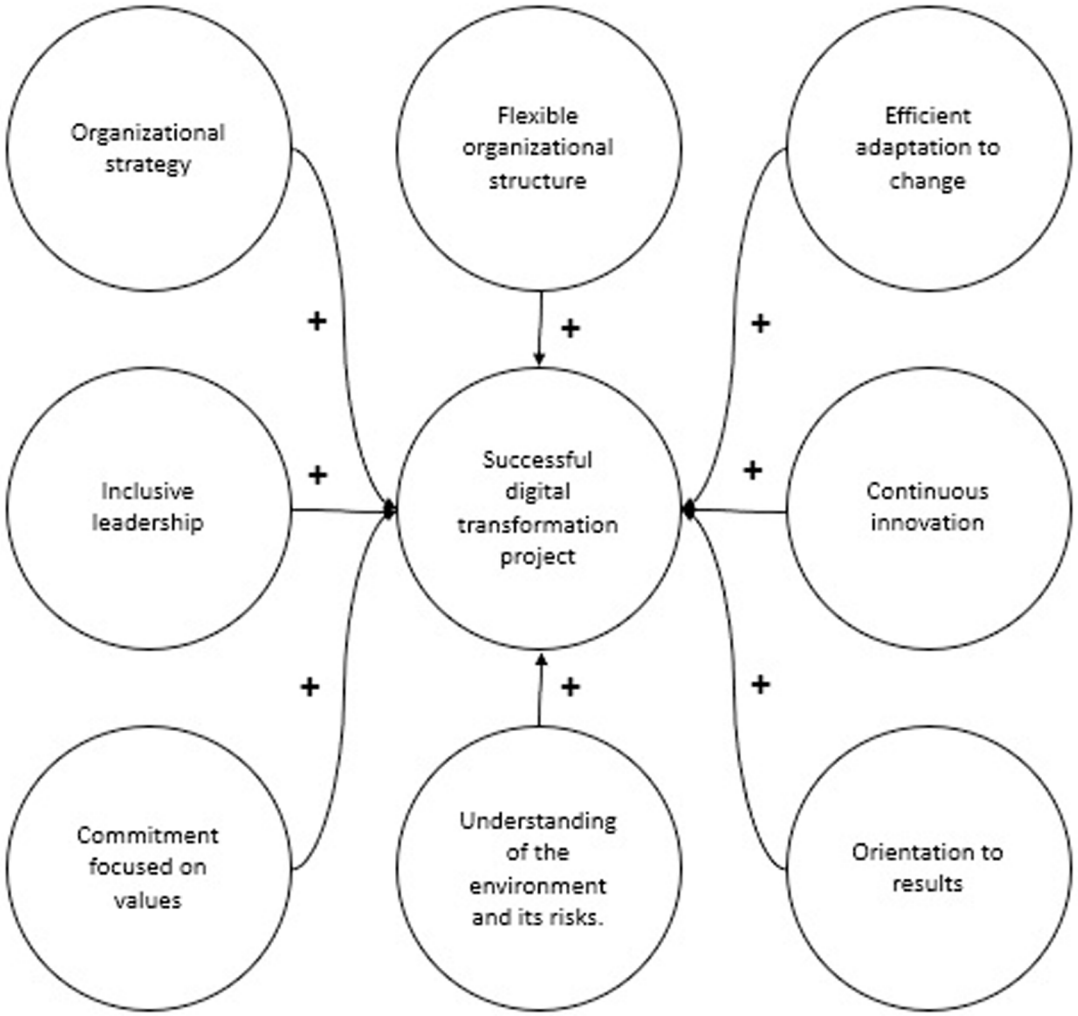
Based on the selected variables, the theoretical model that graphically presents the relationship of the variables and their cause-effect incidence was designed. This allowed us to propose the research hypotheses as a starting point for the statistical analysis of results. Figure 1 presents the proposed theoretical model.

Based on the theoretical model, eight research hypotheses are proposed. These hypotheses will be validated using a correlational statistical model:

- H1. The organizational strategy has a positive impact on the success of digital transformation projects.
- H2. Inclusive leadership has a positive impact on the success of digital transformation projects.
- H3. The commitment focused on values positively affects the success of digital transformation projects.
- H4. The flexibility of the organizational structure has a positive impact on the success of digital transformation projects.
- H5. Understanding the environment and its risks positively affects the success of digital transformation projects.

- H6. Efficient adaptation to change has a positive impact on the success of digital transformation projects.
- H7. Continuous innovation has a positive impact on the success of digital transformation projects.
- H8. Results orientation has a positive impact on the success of digital transformation projects.

Figure 1. Theorical model proposed on selected variables
Source*: Own elaboration based on the consulted authors*



METHODOLOGY

This research is theoretical, descriptive, correlational. In the first part, an interpretive work on bibliographic sources was developed to determine the supporting variables of the study. Based on the results obtained, eight research hypotheses and a theoretical model were proposed. Subsequently, a measurement instru-

ment was designed that made it possible to assess, through fieldwork, the selected factors. Based on the information collected, correlational analysis of variables was performed using the Spearman coefficient.

The measurement instrument used was elaborated with 45 questions, organized into nine groups of 5 questions per variable. The survey aimed to collect the data that would allow validating the existing correlation index between the dependent variable: success in digital transformation projects, and the eight independent variables: organizational strategy; inclusive leadership; commitment focused on values; flexible organizational structure; understanding of the environment and its risks; efficient adaptation to change; continuous innovation and results orientation. The questions applied were structured under a Likert scale: totally agree, agree, neither agree nor disagree, partially disagree, totally disagree. The information was processed by applying the Spearman correlation index, which allows the study of ordinal categorical variables.

The validation of the measurement instrument focused on determining the degree of validity and the reliability index. Regarding the degree of validity, based on the application of the Aiken V index, and with the help of ten researchers with extensive experience in instrument validation, the proposed questions were evaluated in three specific aspects: clarity of the wording; conceptual approach; and relationship of the question with the variable of interest. On the other hand, in the case of the reliability index, a pilot test was carried out applying the measurement instrument to 10 experts with high experience in the direction and management of technological projects. The Cronbach's Alpha index was calculated with the data collected, which showed a degree of precision of the instrument of 0.934 reliability.

For the selection of the sample, a non-probabilistic random convenience sampling method was chosen. The number of people surveyed was 270. The role played by the respondents was that of managers of different Colombian companies, small and medium, belonging to various sectors and industries. Table 7 presents the technical file of the study:

Table 7. Technical file of the investigation

Characteristic	Description
Data collection period	From August to October of 2020
Application city	Bogotá, Colombia
Profile of the person interviewed	Managers of small and medium-sized companies in Bogotá, from various sectors and industries.
Sampling method	Non-probabilistic for convenience
Number of people surveyed	270
Data collection medium	Remote interview, electronic survey.

Source: Own elaboration.

RESEARCH RESULTS

After having processed the collected data, the Spearman index was calculated to validate of the research hypotheses formulated. The results obtained are presented below:

- Hypothesis test 1:

H_0: The organizational strategy DOES NOT positively affect the success of digital transformation projects.
H_1: The organizational strategy has a positive impact on the success of digital transformation projects.

Table 8. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Organizational strategy	Correlation coefficient	0,933*
		Sig. (bilateral)	0,022
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the Spearman Rho test results, presented in table 8, a correlation coefficient of 0.933 can be observed, equivalent to an almost perfect relationship. Likewise, the significance index shows a value of 0.022, less than 0.05, which allows us to conclude that the null hypothesis must be rejected and the alternative hypothesis accepted. In other words, there is a positive correlation between the variable's organizational strategy and success. of digital transformation projects.

- Hypothesis test 2:

H_0: Inclusive leadership DOES NOT positively affect the success of digital transformation projects.
H_2: Inclusive leadership positively affects the success of digital transformation projects.

Table 9. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Inclusive leadership	Correlation coefficient	0,897*
		Sig. (bilateral)	0,019
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the Spearman Rho test results, presented in Table 9, a correlation coefficient of 0.897, equivalent to a high relationship, can be observed. Likewise, the significance index shows a value of 0.019, less than 0.05, which allows us to conclude that the null hypothesis should be rejected and the alternative hypothesis accepted, in other words, there is a positive correlation between the variables Inclusive leadership and success. of digital transformation projects.

- Hypothesis test 3:

H_0: The commitment focused on values DOES NOT positively affect the success of digital transformation projects.
H_3: Commitment focused on values positively affects the success of digital transformation projects.

Table 10. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Commitment focused on values	Correlation coefficient	0,894*
		Sig. (bilateral)	0,034
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the Spearman Rho test results, presented in table 10, a correlation coefficient of 0.894 can be observed, equivalent to a high ratio. Likewise, the significance index yields a value of 0.034, less than 0.05, which allows us to conclude that the null hypothesis must be rejected and the alternative hypothesis accepted, in other words, there is a positive correlation between the commitment variables focused on values and success of digital transformation projects.

- Hypothesis test 4:

H_0: The flexibility of the organizational structure DOES NOT positively affect the success of digital transformation projects.
H_4: The flexibility of the organizational structure has a positive impact on the success of digital transformation projects.

Table 11. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Flexibility of the organizational structure	Correlation coefficient	0,823*
		Sig. (bilateral)	0,011
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the results of the Spearman Rho test, presented in table 11, a correlation coefficient of 0.823 can be observed, equivalent to a high ratio. Likewise, the significance index shows a value of 0.011, less than 0.05, which allows to conclude that the null hypothesis must be rejected, and the alternative

hypothesis accepted, in other words, there is a positive correlation between the flexibility variables of the structure organizational and successful digital transformation projects.

- Hypothesis test 5:

  H_0: Understanding the environment and its risks DOES NOT positively affect the success of digital transformation projects.
  H_5: Understanding the environment and its risks positively affects the success of digital transformation projects.

Table 12. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Understanding the environment and its risks	Correlation coefficient	0,819*
		Sig. (bilateral)	0,031
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the results of Spearman's Rho test, presented in table 12, a correlation coefficient of 0.819 can be observed, equivalent to a high ratio. Likewise, the significance index shows a value of 0.031, less than 0.05, which allows us to conclude that the null hypothesis must be rejected and the alternative hypothesis accepted, in other words, there is a positive correlation between the variables "understanding the environment" and its risks and success of digital transformation projects.

- Hypothesis test 6:

  H_0: Efficient adaptation to change DOES NOT positively affect the success of digital transformation projects.
  H_6: Efficient adaptation to change has a positive impact on the success of digital transformation projects.

Table 13. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Efficient adaptation to change	Correlation coefficient	0,927*
		Sig. (bilateral)	0,027
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the results of Spearman's Rho test, presented in table 13, a correlation coefficient of 0.927 can be observed, equivalent to an almost perfect relationship. Likewise, the significance index shows a value of 0.027, less than 0.05, which allows us to conclude that the null hypothesis must be rejected, and the alternative hypothesis accepted, in other words, there is a positive correlation between the variables efficient adaptation to change and success of digital transformation projects.

- Hypothesis test 7:

  H_0: Continuous innovation does NOT positively affect the success of digital transformation projects.
  H_7: Continuous innovation has a positive impact on the success of digital transformation projects.

Table 14. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Continuous innovation	Correlation coefficient	0,939*
		Sig. (bilateral)	0,017
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the results of the Spearman Rho test, presented in table 14, a correlation coefficient of 0.939 can be observed, equivalent to an almost perfect relationship. Likewise, the significance index shows a value of 0.017, less than 0.05, which allows to conclude that the null hypothesis must be rejected and the alternative hypothesis accepted, in other words, there is a positive correlation between the variables Continuous innovation and success of digital transformation projects.

- Hypothesis test 8:

  H_0: Results orientation does NOT positively affect the success of digital transformation projects.
  H_8: Results orientation has a positive impact on the success of digital transformation projects.

Table 15. Results hypothesis test 1. Spearman's Rho correlation

			Success of digital transformation projects
Spearman's Rho	Orientation to results	Correlation coefficient	0,876*
		Sig. (bilateral)	0,025
		N	270

* The correlation is significant at the 0.05 level (bilateral)
Source: Own elaboration from the processed data

According to the results of Spearman's Rho test, presented in table 15, a correlation coefficient of 0.876 can be observed, equivalent to a high ratio. Likewise, the significance index yields a value of 0.025, less than 0.05, which allows to conclude that the null hypothesis must be rejected, and the alternative hypothesis accepted, in other words, there is a positive correlation between the results-oriented variables and success of digital transformation projects.

DISCUSSION

As evidenced in the results obtained, the authors consulted and the managers surveyed coincide in understanding digital transformation as an organizational effort supported by technology whose purpose is to improve business efficiency and competitiveness. In this sense, the technical perspective takes a back seat, giving prominence to strategy, culture, innovation, human talent and leadership style. This coincides with what is expressed by Goran, LaBerge, & Srinivasan (2017); Zaoui & Souissi (2020); Gong & Ribiere (2020); Lucy (2017); Zaoui & Souissi (2020) in relation to the evolution of the business context and the need to incorporate alternatives to improve operations as a support for business strategy. The technology adopted in companies with one purpose: to strengthen competitiveness; and business evolution framed in organizational culture.

Regarding the success of digital transformation projects, Baccarini (2005); Procaccino & Verner (2006); Linberg (2000) agree that many factor affect the results of a project, but that the most important thing is how they are aligned to guarantee the adequate management of the project life cycle and the results of high quality and great organizational impact. A project with excellent technical results, but with low-value generation for its stakeholders could not be considered successful.

When comparing the results obtained in each one of the selected variables in the light of the consulted authors, we found a high coincidence in the different positions. Regarding the organizational strategy Lee (2021); Elia, Margherita, & Passiante (2020); Spencer (2018); Metwally, Ruiz-Palomino, Metwally, & Gartzia (2019); Ehtesham & Ahmad (2011); Schneider (1975); Ansoff (1968); Patanakul & Shenhar (2012) agree on the need for organizations to have a culture of foresight, in which strategic foresight is the guiding light marking the organization's path to follow, as well as permanent transformation efforts. The technology that is decided to adopt must allow the companies' sustainability over time and respond to a purpose based on concrete solutions. These positions are empirically validated with the managers surveyed, a correlation index of 0.933 was obtained, which shows an almost perfect relationship between organizational strategy and the success of digital transformation projects.

On the other hand, Harrison (1972); Deal & Kennedy (1985); Sethia & Glinow Von (1985); Sethia & Glinow Von (1985) agree on an organizational culture in which inclusive leadership is privileged that will allow companies to evolve in a much more effective way, giving value to the knowledge and experience of people. An inclusive culture is synonymous with teamwork, openness to new ideas and permanent transformation. Organizational values are the basis of a committed and participatory culture. The managers surveyed agreed with these postulates; a correlation index of 0.897 was obtained, which presents a high relationship between inclusive leadership and the success of digital transformation projects, this reflects the reality that companies live that represent the respondents.

Concerning values-based commitment, Peter & Waterman (1984); Harrison (1972); Deal & Kennedy (1985) agree and affirm that a culture supported by values encourages the commitment and performance of workers. Suppose human talent is aligned with the purpose of the organization. In that case, its beliefs

will lead it to give the best of itself, with passion and dedication, obtaining high-quality results that allow the company to grow. Beliefs manifest in personal commitment. For a project to be successful, it must have highly committed work teams. As a result of the survey applied to the managers, a high correlation index of 0.894 was obtained, which allows us to intuit those organizational values play a key role in people's commitment and therefore in the success of digital transformation projects.

In this sense, when analyzing the variable of flexible organizational structure, we find that Harrison (1972); Peter & Waterman (1984) agree in their cultural models, affirming that a flexible structure will allow companies to respond more effectively to changes in the environment. Companies must be permanently transformed and this implies readjusting how work is carried out. The purpose of technology is to improve organizational efficiency by positively impacting processes. Rigid structures limit change. The managers surveyed coincide with this position, a high correlation index of 0.823 was obtained, highlighting the importance of flexible structures in the success of digital transformation projects.

Understanding the environment is another of the variables that define success in technology adoption. Peter & Waterman (1984); Deal & Kennedy (1985); Ansoff (1968) argue the importance of having an organizational culture focused on permanent change, in which it was possible to understand the needs of the environment, the market and ultimately people, as well as the risks that are assuming positions of radical transformation or of acceptance of the status quo. Minimizing uncertainty will allow new and better decisions to be made to benefit of the organization and its workers. In this variable, a high correlation index of 0.819 was obtained, which shows the importance of this variable for managers in the success of digital transformation projects.

For its part, regarding efficient adaptation to change, Harrison (1972); Ansoff (1968) highlight the importance of having an organizational culture focused on lifelong learning, which allows companies to mature their processes and good practices, in order to strengthen their capacities and thus adapt quickly and efficiently to the new challenges of the environment. The managers surveyed highlight the dynamic capabilities of the staff, in this variable an almost perfect correlation index of 0.927 was obtained, being one of the best qualified. Efficient adaptation to change is key to the success of digital transformation projects.

For the case of the continuous innovation variable, Harrison (1972); Ansoff (1968) mark two closely related approaches in their respective models of culture. In the first instance, under the work-oriented approach, the employees' experience is emphasized as a starting point for innovation. On the other hand, a culture of exploration and permanent creativity stands out. This is positively associated with the proposals advised up to this point, in relation to the fact that digital transformation has to do with the company´s culture more than with the tools to be implemented. The correlation coefficient for this variable was almost perfect: 0.939, this was to be expected, given that digital transformation itself is a disruptive innovation for organizations.

Finally, regarding to the results orientation variable, Harrison (1972); Peter & Waterman (1984); Sethia & Glinow Von (1985); they emphasize the importance of the purpose of the actions and a culture supported by values to achieve the objectives. In this sense, not only processes are transformed with the adoption of a new technology, people must also change, generating new useful knowledge to be used in the new context. Technology cannot be understood as a threat but rather as an opportunity to change. This variable obtained a high correlation coefficient of 0.896, which highlights its importance in digital transformation.

CONCLUSION

As a result of this research, it was possible to answer, from the theoretical and from the empirical to the research question formulated. Thus, it can be inferred that having an organizational culture characterized by a defined strategy, an inclusive leadership approach, a high commitment focused on values, a flexible organizational structure, a strong tendency towards understanding the environment and its risks, an efficient adaptation to change, a focus on continuous innovation and a strong orientation to results, significantly improves the probability of success of digital transformation projects.

Digital transformation has a strong impact on organizations, therefore, these types of projects have a high management component. In this sense, people or multidisciplinary work teams are required who are capable of understanding companies and their environment, and how, from engineering, solutions can be generated that allow them to evolve from the identification of their needs and the active participation of his human talent. A project is successful to the extent that its result manages to generate value.

The eight proposed research hypotheses were validated, concluding that organizational culture can positively impact digital transformation projects, improving their probability of success. Thus, culture and values can be considered as the cornerstone that marks the behavior of an organization. The culture is understood as the company's character that allows it to face the different situations that arise from the environment in which it develops.

Given that the measurement instrument was applied in small and medium-sized companies in the city of Bogotá, we see how the managers surveyed agree in valuing culture as a driver of transformation and innovation. This can be coincidental because the companies share the same environment and the challenges, they face can be similar.

Finally, this research work allows showing how the classic theories and models of organizational culture are still valid and apply precisely to the current context of organizations. Likewise, it is interesting to see how a classic proposal fits into a modern concept such as digital transformation.

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KEY TERMS AND DEFINITIONS

Correlation: Statistical technique used to determine the relationship between two or more variables. They take a value between 0 and 1.

Project Management: This chapter takes the definition of the Project Management Institute, which is the application of knowledge, skills, tools, and techniques to project activities.

Spearman Rank Correlation: Spearman rank correlation is a non-parametric test that is used to measure the degree of association between two variables.

Chapter 3
Research on Corporate Sustainability:
A Systematic Review

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ABSTRACT

Corporate sustainability (CS) has many advantages such as enhancing brand value, providing reputation, and also focuses on gaining the trust of stakeholders. This is a qualitative exploratory study; its goal is to understand how CS research has changed over time. The most cited articles were selected from the journals indexed in SSCI (2000-2019). One hundred and two articles were selected and analyzed by content analysis method. Nature of typical samples, major themes, and research methods used were sought to investigate in CS research. Results showed that there was some scarcity in studies choosing a particular country as a sample. There were no articles in areas important for sustainability research. Besides, index types are barely used in articles. Some subject areas have attracted attention for years and haven't lost their popularity, but some remained in the background. The most used method was content analysis.

INTRODUCTION

Corporate governance area where current developments frequently occur and are rapidly affected by social changes and innovations. In this context, many issues in the field of corporate governance have gained importance whereas some have been forgotten. Although the establishment purpose of the companies is to make a profit, the current management approach requires the company to survive and develop, as well as to serve the society in which it is located and to assume responsibilities in various fields.

To fulfill the social responsibility of a company means to be responsible to all its stakeholders and the environment, to consider all these elements in its corporate decisions. It means that companies take measures to protect the environment (environmental quality) and support social activities (social respon-

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siveness) that will provide various benefits to society while realizing their economic objectives (economic growth). This idea brought out concepts such as sustainability and social responsibility for businesses.

Corporate sustainability is closely associated with corporate social responsibility and there is no big difference between corporate sustainability and corporate social responsibility features. The various corporate social responsibility and corporate sustainability activities can be structured into coherent corporate frameworks supporting a specific ambition of corporate sustainability or corporate social responsibility (Marrewijk 2003; Roca and Searcy 2012). Sustainability can contribute to responsibility and responsible practices can be seen as part of a good strategy (Bansal and DesJardine 2014).

Sustainability and social responsibility are becoming increasingly important, especially in large-scale companies. Because all companies are increasingly confronted with managing and responding to expectations of a society alerted to the environmental and social risks associated with economic development (Parnell, 2008). So among them, tools such as triple-bottom-line accounting, sustainability balanced scorecard, life-cycle assessment, eco-efficiency, and environmental information and management systems have been implemented to make business processes more sustainable and extend long-term profit maximization (Signitzer and Prexl, 2007).

The corporate sustainability concept has been the subject of many studies today. Consequently, corporate sustainability is a field with huge literature and continues to develop. Many studies in the corporate sustainability literature contextualize different topics. There are also literature review studies (Linnenluecke and Griffiths 2013; Montiel and Delgado-Ceballos 2014; Rodrigues and Franco 2019) among them. In contrast to these studies, the literature in this study was not examined directly. The main purpose of this study is to understand how the concept of corporate sustainability has changed over time. A similar study has not been encountered in the literature, and it is expected that this study will contribute to filling the gap in this field.

THE CONCEPT OF CORPORATE SUSTAINABILITY

In the late 1970s sustainability was used for the first time in USA with financial and social policy, and it was defined in terms of a transition from growth to a steady-state. The first book "Alternative to Growth: A Search for a Sustainable Future" in this field wrote by Dennis Meadows in 1977 but sustainability as a term was used rarely in specialized literature and not at all in widely read books, magazines, and newspapers. In the 1980s, government agencies used the sustainability concept, and also governments promoted sustainability policies (Kidd, 1992).

Economic and social efficiency formed the sustainability business so economic success would increase when developing social or environmental problems. This thought was the core of business sustainability (Delai and Takahashi, 2013). The concept of sustainability proceeded to evolve and new elements such as eco and socio-effectiveness, sufficiency, and ecological equity were included within the 2000s (Dyllick and Hockerts 2002). With the 21st century, sustainability became a motto and diffusing over all disciplines, from ecology to art, and agriculture to architecture. It embodies the promise of societal evolution towards a more equitable and wealthy world in which the natural environment and our cultural achievements are preserved for generations to come (Bansal and DesJardine 2014; Dyllick and Hockerts 2002).

Sustainability which alludes to economic improvement not only creates prosperity and fulfill the needs of the current generation but also protects the environment and thereby future generations can meet their

needs (Daft 2008). With this perspective, sustainability is an effort to preserve natural resources and avoid waste in operations (Pfeffer 2010). In other words, sustainability contends that companies can discover innovative ways to form wealth at the same time they are protecting natural resources (Daft 2008).

Sustainability issues are forming companies' competitive environment and sustainability highlights natural and community management (Porter and Kramer 2006). So, companies can confront opportunities or risks depending on sustainability. In this context, sustainability implies to what extent an activity regarded effective within a time frame can maintain similar success in the future (Parnell 2008). Shortly sustainability is the ability of the firm to balance the short and long term (Bansal and DesJardine 2014).

In building a sustainable organization, corporations should strive to make themselves sustainable in the economy, the environment, and society (Certo and Certo 2012). Today lots of corporations execute various sustainability efforts under the umbrella of corporate sustainability (Roca and Searcy, 2012). So corporate sustainability is increasingly becoming a corporate value and an integrative part of the business strategy in many companies. It challenges many of the principles underpinning the role, structure, and functioning of corporate governance (Signitzer and Prexl, 2007).

Corporate sustainability is the capacity of a company to proceed working over a long period, depending on the sustainability of its stakeholder relationships (Perrini and Tencati, 2006) because corporate sustainability provides the needs of a company's stakeholders without compromising its capacity to meet the needs of future stakeholders as well (Dyllick and Hockerts, 2002). In other words, corporate sustainability can contribute to benefit maximization and thus contains a positive effect on shareholder value (Signitzer and Prexl, 2007).

Although there are different definitions and various application fields of corporate sustainability (Luchsinger, 2009), sustainability requires economic, social, and environmental performance assessments for companies (Porter and Kramer, 2006). Therefore, there are three fundamental elements as environmental, social, and economic in corporate sustainability:

- *Corporate environmental sustainability:* Environmental sustainability requires avoiding the reduction of natural ecological value and the interaction of economic assets in a harmless way to the ecosystem (Vithessonthi, 2009). Ecologically sustainable companies use only natural resources that are consumed at a rate below the natural reproduction, or a rate underneath the improvement of substitutes. Also, these companies do not engage in activity that degrades ecosystem services (Dyllick and Hockerts, 2002).
- *Corporate social sustainability*: Social sustainability is the combination of distributional justice and the satisfaction of human needs. Improving social sustainability at the company level requires simultaneously improve social and human capital (Spangenberg, 2016). Therefore socially sustainable companies add value to increase the human capital and manage social capital to understand their motivations (Dyllick and Hockerts, 2002).
- *Corporate economic sustainability:* An economy can be both efficient and sustainable, but efficiency does not ensure sustainability. Whether an economy is sustainable or not depends on the time paths of natural-resource and capital endowments and technological progress, all broadly defined (Bishop, 1993). So corporate economic sustainability refers to demonstrating the inclusion of social and environmental concerns in business operations and interactions with stakeholders (Marrewijk, 2003).

In summary, corporate sustainability has various dimensions including economic, social, and environmental issues as such environmental dimensions include the ecosystem wellbeing, social dimension deals with human wellbeing, and economic dimension focuses on wealth creation (Delai and Takahashi, 2013). Sustainability should guide the activities of a company, considering ecological, social, and economic justice between the generations and concerning contemporaries (Vithessonthi, 2009). Increasing corporate sustainability can vary from organization to organization but to achieve a successful sustainability effort, a manager must understand the unique characteristics of a company and the industry that the company exists (Certo and Certo, 2012).

METHODOLOGY

In studies that examine a certain concept in the long term, the systematic review method generally uses and the evaluation unit is created in this way (Gough et al., 2012). Although the systematic review was originated with the social sciences, it is predominantly used in current literature to refer to formal and standardized review papers primarily published in the health sciences (Berrang-Ford et al., 2015; Galavotti, 2019; Torgerson, 2003). On the other hand, the systematic review also a preferred approach in corporate sustainability studies (Ashrafi et al., 2020; Broccardo et al., 2019; Haffar and Searcy, 2017; Linnenluecke and Griffiths, 2013; Montiel, 2008; Montiel et al., 2020; Rodrigues and Franco, 2019; Stewart and Niero, 2018; Tetteh et al., 2019).

The systematic review process of this study, consisting of five stages, was given below:

- *Keywords:* Web of Science is the world's leading scientific citation search and analytical information platform (Li et al., 2018) so Web of Science was used to create the universe of the study. The keyword "corporate sustainability" has been determined to be searched in this database and the search was done in May 2020.
- *Article identification:* Various limitations were made in the search made during the determination of the articles that will form the sample and these limitations were ensured to find articles that reflect the subject most accurately. Firstly, Social Sciences Citation Index (SSCI) was selected from Core Collection, the "title" field was chosen to find articles closely related to the concept, and 2000-2019 was chosen as timespan. After 333 results were found, document type was limited to "article" and 295 articles were identified.
- *Quality assessment:* Quality assessment was the section that the main sample was determined. At this stage, the number of citations (as accepted to determine the quality of an article) was taken into consideration. 102 articles with 20 or more citations were determined among 295 articles and these 102 articles were evaluated.
- *Data extraction:* The content analysis method was particularly useful in corporate sustainability studies (Aras and Crowther, 2009; Barkemeyer et al., 2015; Chen et al., 2017; D'Amato et al., 2015; Delai and Takahashi, 2013; Galbreath, 2011; Gianni et al., 2017; Goyal et al., 2013; Haffar and Searcy, 2017; Hockerts, 2015; Klettner et al., 2014; Landrum and Ohsowski, 2018; Roca and Searcy, 2012; Searcy and Elkhawas, 2012; Stacchezzini et al., 2016). So, content analysis was used to assess the corporate sustainability concept's development. Finally, articles were read in detail and the contents were analyzed using categories. The most important part of designing a process of content analysis was in deciding upon the coding categories (Klettner et al., 2014).

Eight categories (country, industry, index type, subject area, methodology, method, theory, and publication date) were considered to obtain the best data in the study.

- *Data synthesis:* Unlike many previous meta-analysis studies analyzed empirical findings on a given topic, this study was limited to patterns of methods, theories, etc. used in the last 20 years of corporate sustainability-related studies.

The study has four main research questions given below:

RQ 1: What is the nature of the typical samples in corporate sustainability researches?
RQ 2: What are the major themes in corporate sustainability researches?
RQ 3: What research methods have been used in corporate sustainability researches?
RQ 4: What is the state of the art of corporate sustainability researches in general?

RESULTS

It will be useful to summarize the systematic review process before proceeding to the results. Firstly, Social Sciences Citation Index database was chosen and determining corporate sustainability as the keyword, it was searched on the "title". Document type was the article, publication range was 2000-2019, publication language was English. 20 or more cited publications were selected and finally, in total, 102 articles were attained. In this section, data obtained from 102 articles in line with the research questions were given. All results obtained using the eight categories of content analysis in the first three research questions were given below in order. The answer to the fourth research question was given in each category in the discussion section.

RQ 1. What is the Nature of the Typical Samples in Corporate Sustainability Researches?

The first research question was about the samples of the articles and three categories (country, industry, and, index type) were created to identify the article samples.

Country

In the study, it was determined which countries were selected in the articles and studied as samples. According to the findings, 47 articles studied a particular country. USA was the most frequently studied country (n=9) and Australia (n=6), EU (n=6), Brazil (n=5), China (n=3), Asia (n=2) and Canada (n=2) were the other countries. There was only one article about Czech Republic (n=1), Germany (n=1), Hungary (n=1), Italy (n=1), Japan (n=1), Korea (n=1), Mexico (n=1), Netherlands (n=1), Romania (n=1), Scandinavian (n=1), Sri Lanka (n=1), Sweden (n=1), Taiwan (n=1), UK (n=1).

Industry

As the subject of the study was corporate sustainability, the industries chosen as samples in the articles were important. Accordingly, 10 basic industries in Standard Industrial Classification were selected and

articles were evaluated according to this classification system. According to the findings, only 24 studies were covering a specific industry within 102 articles. The most common industry type in the articles was manufacturing (n=15) and followed by retail trade (n=3). Transportation, communications, electric, gas, and sanitary services (n=2), finance, insurance, and real estate (n=2), mining (n=1), and services (n=1) were designated as other industries. There wasn't any study on industries like agriculture, forestry, and fishing (n=0), construction (n=0), wholesale trade and retail trade (n=0), and public administration (n=0).

Index Type

Sustainability research calls for a wider measure of firm performance that accommodates time-based information (Bansal and DesJardine, 2014). For this reason, various measurement tools have been developed. The corporate sustainability improvement is using a suitable set of indicators to measure sustainability performance. An evaluation using a set of indicators is the oldest approach to measuring and evaluating corporate sustainability. Several international institutions deal with corporate sustainability and these institutions have developed various measurement tools called sustainability index and sustainability indexes are instruments to measure the responsibility of a certain company in different areas.

There are many types of indexes developed to measure corporate sustainability. Global Reporting Initiative (GRI), Corporate Sustainability Index (CSI), Dow Jones Sustainability Index (DJSI), Environmental Sustainability Index, UN Global Compact are the most known. In index type section, the indexes mentioned in the articles and the articles used an index were determined. According to the findings, there were only 17 articles with index types. When these articles were examined, three types of index step forth. The most widely used index was the Global Reporting Initiative (n=10) and Dow Jones Sustainability Index (n=5), Corporate Sustainability Index (n=2) followed it.

RQ 2. What are the Major Themes in Corporate Sustainability Research? The second research question was concerned with the subject area of the studies and determining the publish date of them.

Subject Area

Identifying article topics were important to understand the topics that were addressed, emphasized, and missed. All articles were reviewed and each article was added to a specific topic. Topic titles were prepared with the relevant literature (Carroll, 2016, 1999, 1979; Carroll and Shabana, 2010; Schwartz and Carroll, 2003) and 19 topic titles were determined for corporate sustainability studies. The most common topic in all articles was sustainable finance with 27 articles. Other topics such as corporate governance and reporting (n=21), performance measurement and management control (n=16), integrated reporting (n=7), corporate social responsibility (n=5), ethical, social and governance factors (n=4), creating shared value (n=4), shareholder activism, shareholder protection and valuation effects (n=3), corporate citizenship (n=3), corporations and business purpose (n=3), business ethics (n=2), stakeholder's engagement (n=2), ethics and boards of directors (n=1), accounting and disclosure (n=1), cash flows and earning management (n=1) and socially responsible investing (n=1) followed the first one. There wasn't an article related to fraud and accounting scandals (n=0), corporate social performance (n=0), and business-government interactions (n=0) titles have been found.

Year

Another issue that was thought to be closely related to the research themes was the article's publication time. The 20-year research period was divided into five-year segments. The publication year of all articles was determined and the distribution of articles by years was detected. Most publications were published between 2011-2015 with 56 studies. The distribution of other studies by years was as follows: 22 articles were published between 2016-2019, 17 articles were published between 2006-2010, and 7 articles were published between 2000-2005.

RQ 3. What Research Methods Have Been Used in Corporate Sustainability Researches? The third research question was about identifying the methods used in the articles. The method of an article relates to the preferred methodology, theory accepted, and the research method used. For this reason, all articles were evaluated in three categories (methodology, method, and theory).

Methodology

The articles were evaluated in two parts as applied and theoretical. If the article was based on secondary data sources, it was accepted as theoretical, and also the rest were considered as applied. According to the obtained data, there are 76 theoretical articles among 102 articles, and the number of applied articles was determined as 26.

Method

An item list was not determined when evaluating the methods used in the articles but the list was created with the methods determined in the articles. "Unclear" item was created for the articles in which the method used was not expressed by the author or any method could not be determined. 39 articles did not have any method among all articles and it was determined that a specific method was used in the remaining articles. Accordingly, the most preferred method was content analysis (n=15). Other methods were, respectively, interview (n=9), survey (n=9), case study (n=8), data envelopment analysis (n=5), literature review (n=5), data panel regression (n=4), regression analysis (n=2), bibliometric analysis (n=1), fuzzy model (n=1), hermeneutics (n=1), multi-criteria decision aid method (n=1), observation (n=1) and thematic analysis (n=1).

Theory

To understand the perspectives of the studies, the theories involved in the articles were determined. In this context, it was seen that a limited number of studies (n=19) included a theory. The distribution of the theories was as follows: Stakeholder Theory (n=4), Grounded Theory (n=2), Paradox Perspective (n=2), Agency and Signaling Theory (n=1), Cognition Theory (n=1), Contingency Theory (n=1), Information Disclosure (n=1), Innovation Theory (n=1), Institutional Theory (n=1), Neo-institutional Theory (n=1), Resource Dependence Theory (n=1), Resource, Stakeholder and Institutional Theory (n=1), Sensemaking Approach (n=1) and Social Identity Theory (n=1).

DISCUSSION

This study reviews corporate sustainability with the aid of existing studies about corporate sustainability research. It consisted of a systematic review of corporate sustainability research literature to explore the developments of the corporate sustainability concept for 20 years. Detailed explanations for this problem were given under five headings (Country, industry, index type, subject area and research methods).

Country

Under the title of the country, what kind of change occurred regarding countries in corporate sustainability studies was examined and detailed data were obtained for the countries selected as a sample. First of all, it was determined that a particular country was selected as a sample in 47 articles among all articles, and 21 different countries were studied once or more than once. Detailed information for these countries was given in Table 1.

The results reveal that there was still some scarcity in studies choosing a particular country as a sample. Besides, conducting studies on sustainability which choose countries as sample other than the countries mentioned above would enrich this area.

Industry

Under the title of industry, what kind of changes occurred in the field of industry in corporate sustainability studies was examined and the relation between the industry and the subject area was evaluated. In this direction, the industries prominent in sustainability research, and the subject areas were covered in relevant industries were determined. Although 10 basic industry fields were used in the analysis, it was detected that there wasn't any article suitable for 4 fields. Also, the evaluations in this section were made over the determined 24 articles.

When the corporate sustainability researches were examined on an industry basis, it was determined that an article was published between the years of 2000-2005 and the article's subject was manufacturing (n=1). A total of 5 articles were published between 2006-2010. The topics of these articles were manufacturing (n=3), transportation, communications, electric, gas, and sanitary services (n=1) and finance, insurance, and real estate (n=1). 15 articles were published between 2011-2015 when most articles were published on an industry basis. Again, most articles were on manufacturing (n=8), but subject diversity increased in this period. There were articles on retail trade (n=3), finance, insurance, and real estate (n=1), mining (n=1), services (n=1), and transportation, communications, electric, gas, and sanitary services (n=1) topics. 3 articles on the subject of manufacturing (n=3) were published in the period 2016-2019, which forms the part of the current article of the study. Agriculture, forestry, and fishing subject can be the top priority issue in the field of sustainability but there were no studies conducted on this subject. So it was important to study different issues in corporate sustainability research.

Another analysis made on the industry was which topics were available in each industry area and how intensively these topics were treated. Among the 6 industries, the most commonly used area was manufacturing. Sustainable finance (n=6) was the most commonly studied subject in the manufacturing industry. Performance measurement and management control (n=4) followed by ethical, social, and governance factors (n=2), business ethics (n=1) corporate governance and reporting (n=1) corporations and business purpose (n=1) topics were the second most commonly used ones. In the industry

Table 1. Countries with all details

Country	Total article	Industry	Subject	Index	Methodology	Method	Theory	Publication Date
USA	(n=9)	Manufacturing (n=1) Transportation, Communications, Electric, Gas, and Sanitary Services (n=1)	Business ethics (n=1) Corporate governance and reporting (n=1) Creating shared value (n=2) Ethical, social, and governance factors (n=1) Performance measurement and management control (n=4)	Dow Jones Sustainability Index (n=3)	Applied (n=1) Theoretical (n=8)	Bibliometric analysis (n=1) Data envelopment analysis (n=1) Data panel regression (n=2) Interview (n=1) Unclear (n=4)	Information Disclosure (n=1) Stakeholder Theory (n=2)	2006-2010 (n=3) 2011-2015 (n=6)
Australian	(n=6)	Finance, Insurance, and Real Estate (n=1) Mining (n=1) Transportation, Communications, Electric, Gas, and Sanitary Services (n=1)	Corporate citizenship (n=1) Corporate governance and reporting (n=1) Ethics and boards of directors (n=2) Stakeholder's engagement (n=2)	(n=0)	Applied (n=3) Theoretical (n=3)	Bibliometric analysis (n=1) Content analysis (n=2) Data panel regression (n=1) Interview (n=1) Survey (n=1)	Sensemaking Approach (n=1) Stakeholder Theory (n=1)	2006-2010 (n=2) 2011-2015 (n=3) 2016-2019 (n=1)
Europe	(n=6)	Manufacturing (n=1)	Business ethics (n=1) Corporate governance and reporting (n=1) Creating shared value (n=1) Performance measurement and management control (n=1) Sustainable finance (n=2)	GRI (n=1)	Applied (n=3) Theoretical (n=3)	Content analysis (n=1) Data panel regression (n=1) Survey (n=2) Unclear (n=2)	Cognition Theory (n=1)	2000-2005 (n=3) 2011-2015 (n=2) 2016-2019 (n=1)
Brazil	(n=5)	Manufacturing (n=1) Retail Trade (n=1)	Corporate governance and reporting (n=3) Performance measurement and management control (n=1) Shareholder activism, shareholder protection, and valuation effects (n=1)	Corporate Sustainability Index (n=2) GRI (n=1)	Applied (n=2) Theoretical (n=3)	Content analysis (n=1) Interview (n=2) Multi-criteria decision aid methods (n=1) Regression analysis (n=1)	Grounded Theory (n=1) Institutional Theory (n=1) Stakeholder Theory (n=1)	2006-2010 (n=1) 2011-2015 (n=3) 2016-2019 (n=1)
China	(n=3)	Manufacturing (n=1)	Corporate citizenship (n=1) Ethical, social, and governance factors (n=1) Sustainable finance (n=1)	(n=0)	Applied (n=1) Theoretical (n=2)	Content analysis (n=1) Literature review (n=1) Survey (n=1)	Social Identity Theory (n=1)	2011-2015 (n=3)
Asia	(n=2)	(n=0)	Corporate governance and reporting (n=2)	GRI (n=2)	Theoretical (n=2)	Content analysis (n=1) Regression analysis (n=1)	Agency Theory \ Signaling Theory (n=1)	2011-2015 (n=1) 2016-2019 (n=1)
Canada	(n=2)	(n=0)	Integrated reporting (n=1) Sustainable finance (n=1)	Corporate Sustainability Index (n=1) GRI (n=1)	Theoretical (n=2)	Content analysis (n=2)	(n=0)	2011-2015 (n=2)
Czech Republic	(n=1)	Manufacturing (n=1)	Performance measurement and management control (n=1)	(n=0)	Applied (n=1)	Survey (n=1)	(n=0)	2011-2015 (n=1)
Germany	(n=1)	(n=0)	Corporate governance and reporting (n=1)	(n=0)	Applied (n=1)	Survey (n=1)	(n=0)	2011-2015 (n=1)
Hungary	(n=1)	Manufacturing (n=1)	Sustainable finance (n=1)	(n=0)	Applied (n=1)	Bibliometric analysis (n=1)	(n=0)	2006-2010 (n=1)
Italy	(n=1)	(n=0)	Corporate governance and reporting (n=1)	(n=0)	Applied (n=1)	Bibliometric analysis (n=1)	Contingency Theory (n=1)	2011-2015 (n=1)
Japan	(n=1)	Manufacturing (n=1)	Sustainable finance (n=1)	(n=0)	Theoretical (n=1)	Data envelopment analysis (n=1)	(n=0)	2011-2015 (n=1)
Korea	(n=1)	Manufacturing (n=1)	Performance measurement and management control (n=1)	(n=0)	Theoretical (n=1)	Data envelopment analysis (n=1)	(n=0)	2011-2015 (n=1)
Mexican	(n=1)	(n=0)	Sustainable finance (n=1)	(n=0)	Applied (n=1)	Survey (n=1)	(n=0)	2016-2019 (n=1)
Netherlands	(n=1)	(n=0)	Corporations and business purpose (n=1)	(n=0)	Theoretical (n=1)	Unclear (n=1)	(n=0)	2016-2019 (n=1)
Romania	(n=1)	(n=0)	Sustainable finance (n=1)	(n=0)	Applied (n=1)	Survey (n=1)	(n=0)	2011-2015 (n=1)
Scandinavia	(n=1)	Retail Trade (n=1)	Sustainable finance (n=1)	(n=0)	Applied (n=1)	Bibliometric analysis (n=1)	(n=0)	2011-2015 (n=1)
Sri Lanka	(n=1)	(n=0)	Performance measurement and management control (n=1)	(n=0)	Applied (n=1)	Survey (n=1)	(n=0)	2016-2019 (n=1)
Sweden	(n=1)	Manufacturing (n=1)	Corporations and business purpose (n=1)	(n=0)	Applied (n=1)	Interview (n=1)	(n=0)	2016-2019 (n=1)
Taiwan	(n=1)	Manufacturing (n=1)	Sustainable finance (n=1)	(n=0)	Theoretical (n=1)	Unclear (n=1)	(n=0)	2016-2019 (n=1)
England	(n=1)	Finance, Insurance, and Real Estate (n=1)	Corporate governance and reporting (n=1)	(n=0)	Applied (n=1)	Interview (n=1)	Neo-Institutional Theory (n=1)	2011-2015 (n=1)

of retail trade, corporate governance, and reporting (n=1), corporations, and business purpose (n=1) and sustainable finance (n=1) were included. There were 2 articles in industry field transportation, communications, electric, gas, and sanitary services and these articles consist of corporate citizenship (n=1) and ethical, social, and governance factors (n=1) topics. Another industry field with 2 articles was finance, insurance, and real estate, and these articles consist of corporate governance and reporting (n=1) and stakeholder's engagement (n=1) topics. There was an article in the field of services industry and its topic was integrated reporting (n=1). Mining was the last industry area and the only article in this area was on stakeholder's engagement (n=1) topic. Subject headings according to industry fields showed a very diverse distribution.

Index Type

With the title of index type, the change in corporate sustainability research based on the index was evaluated. The current study found that very few articles have indexes. Although there were different types of indexes around the world, it can be seen that three index types gain importance in articles. Among these three, GRI was well ahead of the others in number. GRI, which emerged in the late 1990s, is based on a multi-stakeholder process as an independent institution. Today, GRI is one of the most important reporting tools in the field of sustainability and the results of this study confirmed that GRI was the most common index type in studies. Besides the low number of index-based studies would necessitate new studies in this field. Because the rapid growth of corporate sustainability reporting tools, with different criteria and methodology, has created major complications for stakeholders (Siew, 2015).

Subject Area

Under the title of the subject area, the changes in the subject areas of corporate sustainability research over the years, and the trends of each subject area over the years were examined. In this context, one of 19 subject areas was given to each of the 102 articles but there wasn't any article suitable for 3 subject areas (fraud and accounting scandals (n=0), corporate social performance (n=0), and business-government interactions (n=0)). The subject area change by years was as follows:

- There were 7 articles between 2000-2005 and the subject areas of these articles were sustainable finance (n=2), integrated reporting (n=2), corporate governance and reporting (n=1), corporate social responsibility (n=1), performance measurement and management control (n=1).
- There were 17 articles between the years 2006-2010 and the subject areas of these articles were sustainable finance (n=3), corporate governance and reporting (n=3), performance measurement and management control (n=3), corporate social responsibility (n=2), corporate citizenship (n=2), creating shared value (n=1), integrated reporting (n=1), stakeholder's engagement (n=1), shareholder activism, shareholder protection and valuation effects (n=1).
- With 56 articles, the period from 2011 to 2015 had the highest number of articles. For this reason, the subject area diversity was higher than in other periods. The subject areas of these articles were sustainable finance (n=17), corporate governance and reporting (n=11), performance measurement and management control (n=9), ethical, social and governance factors (n=4), integrated reporting (n=3), accounting and disclosure, business ethics (n=2), cash flows and earning management (n=1), corporate citizenship (n=1), corporate social responsibility (n=1), corporations

and business purpose (n=1), creating shared value (n=1), ethics and boards of directors (n=1), shareholder activism, shareholder protection and valuation effects (n=1), socially responsible investing (n=1), stakeholder's engagement (n=1).

- 22 articles were published between the years 2016-2019 and the subject areas of these articles were corporate governance and reporting (n=6), sustainable finance (n=5), performance measurement and management control (n=3), corporations and business purpose (n=2), creating shared value (n=2), corporate social responsibility (n=1), ethics and boards of directors (n=1), integrated reporting (n=1), shareholder activism, shareholder protection and valuation effects (n=1).
- The main articles of sustainability research were indisputably made before 2011. However, according to this study, there has been a period between the years 2011-2015 where many articles on different subject areas were published. This period can be regarded as the years in which sustainability studies mature. Another evaluation regarding the subject area in the study was made on the change of each subject over the years (Table 2).

Table 2. The subject areas with the number of articles by years

	2000-2005	2006-2010	2011-2015	2016-2019	Total number of articles
Accounting and disclosure			1		1
Business ethics			2		2
Cash flows and earning management			1		1
Corporate citizenship		2	1		3
Corporate governance and reporting	1	3	11	6	21
Corporate social responsibility	1	2	1	1	5
Corporations and business purpose			1	2	3
Creating shared value		1	1	2	4
Ethical, social, and governance factors			4		4
Ethics and boards of directors			1	1	2
Integrated reporting	2	1	3	1	7
Performance measurement and management control	1	3	9	3	16
Shareholder activism, shareholder protection, and valuation effects		1	1	1	3
Socially responsible investing			1		1
Stakeholders engagement		1	1		2
Sustainable finance	2	3	17	5	27

According to Table 2, some subjects have attracted attention for 20 years and have not lost their popularity. Some subject areas were used in quite a lot of studies between certain years and some subject areas, especially ethical subjects, emerged after certain years. On the other hand, after 2011, new studies were carried out in different subject areas.

Research Methods

Under the title of research methods, trends of the methods used in corporate sustainability studies were evaluated. In this context, methodologies, methods, and theories used in sustainable research have been determined and their relationships have been exhibited with their historical dimension.

Methodology

Methodology and method are the most important elements that determine the perspective of research. In this study, the relationship between the methodology and method of the articles was examined, and a conclusion was reached about the research methods of the articles in this field. In this context, 39 articles with theoretical methodology did not have a valid method. Among the remaining 34 articles, the most used method was content analysis with 14 articles. Data envelopment analysis in 5 articles and literature review methods in 5 articles were used. Data panel regression (n=4), bibliometric analysis (n=3), and regression analysis (n=2) methods were used more than once. Fuzzy model (n=1), hermeneutics (n=1), multi-criteria decision aid methods (n=1), and thematic analysis (n=1) methods were found in only 1 article. One method was used in each of the applied articles. Interview (n=9) and survey (n=9) were the most preferred methods. Bibliometric analysis was used in 6 articles. Content analysis (n=1) and participant-observation (n=1) methods were found in an article. When the article methodologies were evaluated by years, 6 theoretical articles, and 1 applied article between 2000-2005, 12 theoretical and 5 applied articles between 2006-2010, 40 theoretical articles, and 16 applied articles between 2011-2015, 18 theoretical articles and 4 applied articles were published between 2016-2019.

Method

Corporate sustainability scholars commonly measured corporate sustainability by analyzing secondary data sources such as *company reports* (Bae et al., 2018; Barkemeyer et al., 2015; Bonilla-Priego et al., 2014; Chen et al., 2017; Galbreath, 2011; Klettner et al., 2014; Landrum and Ohsowski, 2018; Peters and Romi, 2013; Roca and Searcy, 2012; Searcy and Elkhawas, 2012), *databases* (Chang et al., 2013; Kaspereit and Lopatta, 2016; Linnenluecke and Griffiths, 2013; Nadeem et al., 2017; Wagner, 2010; Wang et al., 2014), *websites* (Kong Cheung, 2011; Stacchezzini et al., 2016), and *published literature* (Antolín-López et al., 2016; Bai et al., 2015; Baumgartner, 2014; D'Amato et al., 2015; Delai and Takahashi, 2013; Gianni et al., 2017; Goyal et al., 2013; Haffar and Searcy, 2017; Montiel, 2008; Montiel and Delgado-Ceballos, 2014). To conceptualize sustainability, applied corporate sustainability researches used *firm surveys* (Choi and Yu, 2014; Linnenluecke et al., 2007; Lloret, 2016; Paraschiv et al., 2012; Wagner, 2005; Wijethilake, 2017; Windolph et al., 2014), *employee surveys* (Dočekalová and Kocmanová, 2016; Guerci et al., 2015), *interviews* (Bos-Brouwers, 2010; de Abreu, 2009; Eccles et al., 2014; Lozano, 2015; Pedersen et al., 2018; Strand, 2014), *a combination of interview and documentary analysis* (Orsato et al., 2015; Smith et al., 2011), *a combination of interview and focus group* (Angus-Leppan et al., 2010), *participant observation* (Engert and Baumgartner, 2016).

Theory

The results of this study indicate that there were few articles based on a theory and a total of 14 different theories were used in articles. According to the data, 11 theories were used only once, Grounded Theory (n=2) and Paradox Perspective (n=2) were used in 2 articles. Several theoretical frameworks were used to explore the notion of corporate sustainability but Stakeholder Theory is the most prominent of these theoretical frameworks (Roca and Searcy, 2012). The data support this perspective because the most common theory was the Stakeholder Theory in all studies. The use of theory according to the subjects is as follows: Corporate governance and reporting were one of the subject areas in which theories were frequently used. Sustainable finance and performance measurement and management control are the other topics in which theories were used. Besides, when the theories were evaluated according to publication date, there wasn't any article with a theory between the years 2000-2005, while 4 articles with a theory were published between 2006-2010 and 4 articles between 2016-2019. The most intense period in terms of theory usage was the years between 2011-2015 with 11 articles. Articles with theory were examined and methodologically, similar results were obtained. Namely, 10 theoretical articles and 9 applied articles were determined.

CONCLUSION

Systematic review studies are very useful in understanding and gaining knowledge on a particular subject. This study set out to have a better understanding of the change in the corporate sustainability concept. For this purpose, the last twenty years of the corporate sustainability literature have been evaluated. This study has been one of the first attempts to thoroughly examine the published literature on corporate sustainability within a certain time. The study contributes to our understanding of the strengths and weaknesses of corporate sustainability literature. The limitations of the sample versus the size of the universe could be a problem in representation ability. Because the data used in this study was confined to those research articles and review articles that were published in journals, and they were retrieved only from the Social Sciences Citation Index. However, this study can still be deemed sufficient to draw a view of the field and gain an opinion. The study represents a comprehensive examination of corporate sustainability to cover twenty years, examine the most cited studies in the field, and discuss each study from different angles.

Systematic reviews are important to identify flaws, biases, and gaps in a specific subject. There wasn't any study on industries like agriculture, forestry, and fishing, construction, wholesale trade and retail trade, and public administration. It is important to study missing issues in corporate sustainability research. Academic studies can be conducted by collaborating with companies on these missing subjects. The results obtained will contribute to both academia and practitioners. It is necessary to measure sustainability to achieve optimum sustainability including social, economic, and environmental dimensions for practitioners. The way to do this is to use a specific reporting tool. One of the best reporting tools a company can use in its sustainability reporting is GRI and the results of this study confirmed that GRI was the most common index type in studies.

Corporate sustainability can vary for companies but to achieve a successful sustainability effort, a manager must understand the sustainability concept. Some subjects as sustainable finance, corporate governance, and reporting, performance measurement, and management control, etc. have attracted at-

tention for 20 years and have not lost their popularity. Recently, issues related to ethics have emerged and new studies are being conducted on this subject. The study helps managers to identify important issues and provide them with a specific perspective. Academic studies can help to determine the current status and general understanding of a field. Also, companies can benefit from academic studies in a variety of ways. For instance, scholars commonly measured corporate sustainability by analyzing secondary data sources such as company reports, firm surveys, employee surveys, interviews, focus groups, and participant observation. All these practices are an opportunity for companies to evaluate themselves. Thus, companies will be able to see their gaps and take the necessary measures. More research will help academics and practitioners to improve the knowledge about corporate sustainability and will allow companies to adopt these to their strategies.

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KEY TERMS AND DEFINITIONS

Corporate Economic Sustainability: Corporate economic sustainability is the inclusion of social and environmental worries in commercial activities.

Corporate Environmental Sustainability: Environmental sustainability is avoiding the reduction of ecological value and the interaction of economic assets in a harmless way with nature.

Corporate Social Responsibility: Corporate social responsibility aims to contribute to society by participating in or supporting volunteering practices.

Corporate Social Sustainability: Social sustainability is improving social and human capital together in organizations.

Corporate Sustainability: Corporate sustainability is the capacity of a company to proceed working over a long period, depending on the sustainability of its stakeholder relationships.

Global Reporting Initiative: GRI is a guide, and its main function is that companies can report the environmental, social, and economic results of their activities and products or services.

Sustainability Reporting: An evaluation using a set of indicators is the oldest approach to measuring and evaluating corporate sustainability.

Chapter 4
Management Practices in Chaotic Environments of SMEs in Bogota

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ABSTRACT

The purpose of this chapter is to analyze the management practices in chaotic environments followed by micro and small enterprises (MSEs) in Bogota, specifically in the neighborhoods of Candelaria, Bosa, Puente Aranda, and Tunjuelito to generate sales and profit. In order to accomplish the foregoing, a co-relation analysis is made among the management practices that can be implemented by MSEs in sales and profit when faced with chaotic environments. The management practices used as independent variables in this study were human resources management, market analysis, suppliers, direction management, finance, sales, production-operation, innovation, marketing, and entrepreneurial responsibility. The dependent variables considered were annual sales and profit.

INTRODUCTION

Management in today's organizations is getting more complex every day due to the constant changes in the global and sector environment as a result of markets which are increasingly competitive, fortuitous and, therefore, with episodes of order, disorder, and chaos.

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Salazar (2017) mentions that organizations are exposed to turbulent and changing environments where there appear signs that can become opportunities, from management and innovation practices that can allow to rethink their course to generate new products and services that better meet the customers' needs.

Considering the foregoing, according to the "chaos theory", open, dynamic and complex systems such as enterprises are exposed to different factors which probably have not been considered from the beginning and that may change, transforming them in chaotic and unpredictable. This means that the irrelevant variables that a system may have from the beginning can turn into momentous ones, no matter their behavior, thus conditioning the operation of the whole system. The foregoing is one of the reasons why innovation plays an important role in organizations, since it helps companies to face the alterations that appear in a dynamic non-linear system. As assured by Marchione (2010, p.7) quoting Melendez (2000):

based on the value innovation logic, the company itself is prepared to alter the essential and initial conditions of the system. In this way, the innovator is in a better position to face the alterations in a dynamic non-linear system, such as the development of business, because it is the innovator who causes the alterations, which -as minimum and insignificant they may seem today, can deeply affect the market and the traditional parameters of an industry.

Along with the above mentioned, another important concept arises to face situations of chaos, which is "good practice". It is conceived of as a model or activity to be followed because, thanks to its implementation, it shows that it is especially relevant since it gives a competitive advantage to the organization with respect to its main competitors, helping it to reach the first places in the sector it belongs to. "Good practice" shows itself relevant because it represents a value for any organization that wants to be competitive and it allows companies to offer the best products or services in the market, thus contributing to reach the corporate objectives (Fernandez 2014, quoting Chickering and Gamson 1991).

On the other hand, and taking into account that this research is focused on MSEs, following is an analysis thereon. In Colombia, 94.7% of registered companies are micro enterprises and 4.9% are small and medium size organizations, hence their importance for the economy of this country (Cubillos-Calderon, Montealegre-Gonzalez, & Caceres-Mayorga, 2018). As per the Chamber of Commerce of Bogota (2019), in Bogota, the capital city, as of November 2018, the city had 788,675 companies and trade establishments, 91.4% of which are micro enterprises, 6.1% small enterprises and 1.8% medium size enterprises. However, an alarming situation arises since 85% of the MSEs tend to disappear three years after their organization. Moreover, management in these organizations shows a high degree of informality and most of them are characterized for giving importance to setting prices as the main strategy to survive in a highly competitive market and in many cases, affecting the profit of the organization. To operate with a proper profit margin allows them to guarantee self-sustainability over time. (Rincon, 2017)

Rincon (2017) assures that in his experience as consultant for this type of organizations, most of them do not carry out a thorough research, modelling and validation of the market that can allow them to compile previous information to build a business plan according to the needs of the market. The MSE entrepreneur thinks that a business can work based on his observation of the environment and on intuition. Rincon further gives the following reasons for such entrepreneurs to open a business:

- To copy a successful model based on observation and on the belief that if there are several companies working on a specific activity, then, it can be inferred that they are doing well because it is

perceived that they sell a lot. This condition encourages them to open a similar business, although they do not know much about it.

- There are few businesses of this kind and, therefore, it is believed that it will be successful because there are not too many competitors.
- They know a trade or a certain technique to produce a good or a service and they think that this fact makes them suitable to open a company or to start a business, even though there are many competitors. It is believed that if they have been able to succeed, others will too. This is more than enough reason to enter the market.
- They have the financial resources to set up a whole infrastructure and to have enough capital to remain in the market, thus making them mistakenly think that capital itself is enough to assure permanence in a market full of competitors.
- They have experience in the business and the resources to begin an undertaking and they think that both aspects are enough support to guarantee success, unlike other companies.
- They have the knowledge, the experience, and the academic formation to open a successful business. Knowledge is the fundamental tool for taking the decision to establish a company and experience gives them confidence and support to open a business without fear of failing. It is believed that they only lack the resources to begin, and success is guaranteed.

According to Rincon (2017, p.44), there are three essential aspects that cause 85% of the companies to fail during the first three years of operations:

1. Lack of theoretical and practical entrepreneurial formation of Colombian entrepreneurs and undertakers and specially those belonging to the MSE group (micro companies of the manufacturing sector: income value for annual ordinary activities less than or equal to 23,563 TVU[1], service sector less than or equal to 32,988 TVU and trade sector less than or equal to 44,769 TVU; small companies of the manufacturing sector: income value for annual ordinary activities over 23,563 TVU and less than or equal to 204,995 TVU, service sector, more than 32,988 TVU and less than or equal to 131,951 TVU and trade sector, more than 44,769 TVU and less than or equal to 431,196 TVU).
2. Lack of a preliminary business plan that allow entrepreneurs to act based on previous knowledge and criterion of the business model that they wish to start, so they can run calculated risks supported on reliable information for decision making.
3. Lack of a measurement and follow-up culture on their entrepreneurial management, based on the building of a Strategic Map backed by KPI[2] (key indicator), BSC (Balance Score Cards) and EIP (Entrepreneurial Improvement Plans) as support tools for each company.

CHAOTIC ENVIRONMENTS AND ENTREPRENEURIAL STRATEGY

According to Martinez-Moncaleano (2018), complexity sciences, understood from the standpoint of unpredictability and irreversibility (Arce-Rojas, 2020), include the study of the chaos theory, which has significantly helped in the study of several phenomena. These studies have been supported by the contribution of mathematician and climate scientist Edward Lorenz[3] who formally propounded it in the 60's. The non-linearity idea and the difficulty to predict the evolution of certain systems are part

of this theory. Therefore, it can be said that "the chaos theory studies the sensibility to initial conditions of certain systems, that is, of those systems in which a small change can cause big consequences" (p.208). Given the foregoing, it can be assured that a characteristic of chaos is that it has an open system condition and, furthermore, that its effects are not proportional to the causes, which means that chaotic phenomena are not linear.

Talking about chaos involves two important aspects: 1) it generates irreversible processes that leave mark over time and 2) order conditions can be reached from disorder conditions (Martinez-Moncaleano, 2018 quoting Ferrari, 2003).

Among the practices in the entrepreneurial field, it is worth mentioning that whenever an organization draws up a strategy, it is necessary to consider several variables that will finally have an effect on its evolution. For this reason, depending on its actions, the company may be involved in a series of turmoil situations and uncertainties given by the environment surrounding it. Based on the foregoing, Ferrari (2003) quoted by Martinez-Moncaleano, (2018, p. 210) states that strategy is characterized by:

1. the impossibility of its conception to be linear,
2. the complexity of the aspects to be considered,
3. the need to know the deep interrelations among the variables,
4. the increasing difficulty to create it given the fact that there are more and more players to consider, new associations between companies, new solutions and new services.

Martínez-Moncaleano (2018, p. 211) concludes that the idea of chaos in an organization constitutes "the natural evolution of uncertainty in a turbulent environment"; therefore, chaos is needed in organizations in order for companies to achieve a permanent renovation and dynamism. In this sense, Blanco-Encinosa (2005) assures that organizations can be managed under conditions of chaos, uncertainty, and high instability provided that managers are aware of the situation, accept the given conditions and adapt management methods and techniques that meet the requirements called for by that chaotic condition.

However, there are organizations which are managed without clear and organized practices and whenever an unstable system is generated for any reason, bigger chaos and disorganization appear. A positive entropy emerges in the system which is exceedingly difficult to eliminate because it is caused by the chaos-producing action of both the managers and the employees. It is then when information and knowledge become cornerstones for the company so it can move from a "chaotic" situation to "order in chaos". These are the organizations which are capable of learning and constantly change (Blanco-Encinosa 2005).

MSEs in Chaotic Environments

Micro and small enterprises (MSEs) in Colombia are classified according to their economic activity (manufacturing, commercial or services) and their size is determined based on the income from ordinary activities per annum represented in Tax Value Units (TVU) (Ramirez-Garzon, Muñoz-Maya, Diaz-Villamizar and Barrera-Valbuena, 2021). Per Barahora-Paipilla, Ruiz, & Moreno (2019), there are 2,540,953 micro, small and medium size enterprises (MSMEs) in Colombia, which account for 90% of the economic activity in the country. They also produce 30% of the National Gross Product (NGP) and hire 65% of the labor force nationwide. However, Rincon (2017) states that the mortality rate of the

MSEs is high since it is around 80%. The trend is that half the MSEs file for bankruptcy in the first year of operations and only 20% survive through the third year.

As mentioned in Semana Review (2017), the foregoing shows that MSEs move within a "paradoxical" environment since, although their contribution to the economy is relevant, their conditions and the environment surrounding them diminish in many cases their competitiveness, not allowing them to be the driving force they could be, especially in chaotic situations or in times of deceleration.

The production capacity of such companies is affected by both internal and external factors. Sergio Clavijo, President of Anif[4], assures that according to studies carried out by that entity, MSEs show several flaws among which are the following: short term vision, because the MSE entrepreneur usually plans the business for 6 months to one year, thus reducing the possibility for growth; priority for such companies is to cope with day issues without giving importance to aspects that can generate added value in order to make a difference in the sector in which they operate; difficulty to access the financial system, which forces them to look for resources to cover their short-term cashflow rather than to invest in their growth and in the development of innovation projects, and the low level of diversification of the markets (Semana Review, 2017; Barahora-Paipilla, Ruiz, & Moreno, 2019).

With respect to the financial problems faced by MSEs, Laiton-Angel & Lopez-Lozano (2018) state that these organizations have strong growth constraints because access to financing is limited due to the collaterals required by banking entities and to the loan costs, since interest rates are high. This situation of chaos leads managers to use personal collaterals to take loans in the company's name or to take personal loans to finance the entrepreneurial activities. Even though there are macroeconomic policies in Colombia to facilitate access to credit, the lack of knowledge thereof makes entrepreneurs to choose the commercial banking as source of external financing.

Due to the fact that banks in Colombia require the trade register (which proofs the commercial activity of the company) and the financial statements when granting a loan, MSEs are forced to look for financing through informal credits, since many of these companies are nor registered with the Chamber of Commerce and the financial statements are not always true (Laiton-Angel & Lopez-Lozano, 2018).

On the other hand, Rosmery Quintero, President of Acopi[5], thinks that the poor sophistication of the production equipment, the lack of an exporting culture and informality in handling labor are the factors that prevail in Colombian MSEs (Semana Review, 2017).

Among the challenges that MSEs in Colombia have to face are "surviving and growing in an increasingly demanding market in terms of productivity and competitiveness, bearing high tax burdens, high labor costs and lack of labor flexibility" (Barahora-Paipilla et.,al, 2019, parr. 3, quoting Dinero Review,2017), thus challenging in this way a situation of chaos which, following good managerial practices, will allow them to significantly improve their innovation capacity and their human capital besides entering the local, regional, and global value chains, as the case may be.

METHODOLOGY

Type of Research

The type of this research is descriptive because it analyzes how a phenomenon is, how it rises, and which are its components. In this case, the research analyzes how some management practices have an impact on increased sales and profit. A description is also given on the management practices followed

by the MSEs analyzed. This research is also co-relational because the purpose of which is "to know the relationship or association degree between two or more concepts, categories or variables in a specific sample or context" (Hernandez-Sampieri, Fernandez and Baptista 2014, p. 93). The research assesses the association degree between increase in sales and profit and management practices (human resources management, market analysis, suppliers, direction, finance, sales, production-operation, innovation, marketing, and entrepreneurial responsibility).

The quantitive approach is chosen because it determines the impact of the abovementioned independent variables on the two dependent variables. A co-relation analysis is carried out to determine its impact. According to Hernandez-Sampieri et al., (2014), the quantitative approach allows to collect data to prove the assumptions raised, taking into account the statistical analysis made on the abovementioned variables.

Hypotheses

Per Hernandez-Sampieri et al., (2014), hypotheses attempt to explain a phenomenon being studied and, since the scope of this research is co-relational, the following hypotheses are made:

- H1. Some management practices have an impact on the increase in annual sales of MSEs in Bogota, specifically those located in Candelaria, Bosa, Puente Aranda and Tunjuelito, even though they are in chaotic environments.
- H2. Some management practices have an impact on the profit of MSEs in Bogota, specifically those located in Candelaria, Bosa, Puente Aranda and Tunjuelito, even though they are in chaotic environments.

Sample

Based on the data supplied by the City Hall of Bogota (2019), the neighborhoods of Candelaria, Bosa, Puente Aranda and Tunjuelito located in Bogota, have a population of 1,216,359 inhabitants and 99,911 economic units, 99.6% of which are micro and small enterprises.

A convenience sample was taken in this zone and the participation of 465 directors of micro and small enterprises was achieved. Students collaborated in collecting the information.

Data Collection Instrument

The instrument used was validated by the Latin American Studies Network in Management and Business – LASNMAB (RELAYN for its abbreviation in Spanish) and 38 questions were chosen in relation to the ten management practices set forth, as well as two questions related to the dependent variables increase in annual sales and increase in profit. The types of practice and the variables considered are shows in table 1.

FINDINGS AND DISCUSSION

Findings

Impact of the Management Practices on the Increase in Sales

The results prove the hypothesis that some management practices have an impact on the increase in annual sales of the MSEs in Bogota located in Candelaria, Bosa, Puente Aranda and Tunjuelito, even though they are in chaotic environments, because there is a significant co-relation at the 0.01 level with human resources management practices, sales management practices and marketing management practices. There is also a co-relation at the 0.05 level with market analysis management practices, direction management practices and management practices on innovation, as shown in table 2.

Impact of the Management Practices on Increase in Profit

The results prove the hypothesis that some management practices have an impact on the increase in annual profit of the MSEs in Bogota located in Candelaria, Bosa, Puente Aranda and Tunjuelito, even though they are in chaotic environments, because there is a significant co-relation at the 0.01 level with human resources management practices, direction management practices, sales management practices and marketing management practices. There is also a co-relation at the 0.05 level with market analysis management practices and management practices on innovation, as shown in table 3.

Besides the management practices analyzed, a co-relation analysis is made between the number of hours devoted per week and the increase in sales and profit, with the following results:

Number of Hours Devoted per Week

The highest percentages of number of hours devoted per week are in the range of up to 12 hours per day (36.3%), up to 9 hours per day (33.8%) and up to 15 hours per day (6.2%), which shows that regarding management practices, daily dedication is a feature of this type of organizations, as shown in table 4.

Notwithstanding the foregoing, no relation was found between the number of hours devoted per day with the increase in sales and in profit; however, there was a relation between the increase in sales and the increase in profit, as shown in table 5.

General Results of the Management Practices by MSEs

The results show that MSEs use a wide variety of management practices, but the sample organizations benefit from management practices with suppliers, finance management and production-operation management practices. Management practices on entrepreneurial responsibility are used the least, as shown in table 6.

Table 1. Management practices by MSEs

Type of practice	Independent Variables
Human resources management practices (6)	Employees' productivity approach
	Employees' satisfaction approach
	Employees' well-being approach
	Performance appraisal
	Participation in decision making
	Higher salaries
Management practices in market analysis (3)	Market analysis
	Easy appearance of competitors
	Follow-up on competition
Management practices with suppliers (3)	Price-oriented selection of suppliers
	Quality-oriented selection of suppliers
	Service-oriented selection of suppliers
Direction management practices (5)	Attention to business trends
	Reinvestment of profits
	Clarity on the vision
	Management by objectives
	Advising by experts
Finance management practices (3)	Cashflow planning
	Control over sales
	Control over expenses
Sales management practices (6)	Search for new customers
	Search for new markets
	Sales promotions
	Sales discounts
	Adjustment to the market
	Relations with customers
Production-operation management practices (3)	Quality-oriented processes
	Processes oriented towards reducing time
	Cost-oriented processes
Management practices on innovation (2)	Orientation towards innovation (To offer innovating products or services)
	Attendance to shows, conferences. courses
Marketing management practices (6)	Strategies to set prices
	Trademark development
	Strategy for distribution to end users
	Sales on credit
	Advertising and promotion
	Customers' loyalty
Management practices on entrepreneurial responsibility (1)	Promotion of community development activities
	Dependent
	Increase in annual sales
	Increase in profit

Source: Own preparation based on the 2019 LASNMAB questionnaire

Human Resources Management Practice

Table 2. Pearson's co-relation analysis for increase in sales

Variables	Increase in sales	
	Pearson's co-relation	**Sig. (bilateral)**
Human resources management practices	.156**	.001
Market analysis management practices	.104*	.025
Management practices with suppliers	-.021	.658
Direction management practices	.197**	.000
Finance management practices	.071	.125
Sales management practices	.162**	.000
Production-operation management practices	.020	.663
Management practices on innovation	.099*	.032
Marketing management practices	.165**	.000
Management practices on entrepreneurial responsibility	.050	.279

** Co-relation is significant at the 0.01 level (bilateral)
* Co-relation is significant at the 0.05 level (bilateral)
Source: Result based on SPSS

Market Analysis Management Practices

Regarding market analysis management practices, MSEs mainly take into account how easy it is for similar enterprises to appear, as shown in table 8.

Management Practices with Suppliers

With respect to management practices with suppliers, MSEs think that for them, quality of the product or service is the most important aspect in a supplier, as shown in table 9.

Direction Management Practices

Regarding direction management practices, MSEs prefer to invest the companies' profits in order to make them grow and to set forth specific objectives that the companies must meat, as shown in table 10.

Finance Management Practices

Concerning finance management practices used by MSEs, a similar result is observed in the aspects analyzed, although slightly better is control over sales and over expenses, as shown in table 11.

Table 3. Pearson's co-relation analysis for increase in profit

Variables	Increase in profit	
	Pearson's co-relation	Sig. (bilateral)
Human resources management practices	.164**	.000
Market analysis management practices	.098*	.034
Management practices with suppliers	-.018	.694
Direction management practices	.182**	.000
Finance management practices	.073	.116
Sales management practices	.149**	.001
Production-operation management practices	.035	.447
Management practices on innovation	.110*	.017
Marketing management practices	.158**	.001
Management practices on entrepreneurial responsibility	.025	.593

** Co-relation is significant at the 0.01 level (bilateral)
* Co-relation is significant at the 0.05 level (bilateral)
Source: Result based on SPSS

Table 4. Number of hours devoted per day

Number of hours devoted per day		Frequency	Percentage
Valid	No time per day	3	.6
	Up to 3 hours per day	9	1.9
	Up to 6 hours per day	30	6.5
	Up to 9 hours per day	157	33.8
	Up to 12 hours per day	169	36.3
	Up to 15 hours per day	68	14.6
	More than 15 hours per day	29	6.2
	Total	465	100.0

Source: Result based on SPSS

Table 5. Pearson's co-relation analysis for number of hours devoted per day, increase in sales and increase in profit

Number of hours devoted per day		Increase in sales	Increase in profit
Number of hours devoted per day	Pearson's co-relation	-.041	-.003
	Sig. (bilateral)	.373	.942
Increase in sales	Pearson's co-relation		.876**
	Sig. (bilateral)		.000

** Co-relation is significant at the 0.01 level (bilateral)
Source: Result based on SPSS

Table 6. Results of the management practices used by MSEs

Variables	Average	Deviation
Human resources management practices	3.714	.8965
Market analysis management practices	3.602	.8811
Management practices with suppliers	4.331	.6245
Direction management practices	3.786	.6963
Finance management practices	4.154	.6401
Sales management practices	3.609	.8531
Production-operation management practices	4.245	.6177
Management practices on innovation	3.474	.9768
Marketing management practices	3.782	.6853
Management practices on entrepreneurial responsibility	3.178	1.4400

Source: Result based on SPSS

Sales Management Practices

In relation to sales management practices by MSEs, the approach observed is towards activities to detect and add new customers to the company, to carry out activities to promote sales and to make discounts to certain customers to close sales, as shown in table 12.

Table 7. Results of human resources management practices used by MSEs

Human resources management practices	Average	Deviation
Employees' productivity approach	4..06	.960
Employees' satisfaction approach	3.78	1.097
Employees' well-being approach	3.90	1.063
Performance appraisal	3.86	1.100
Participation in decisión making	3.57	1.272
Higher salaries	3.11	1.326
Human resources management practices	3.714	.8965

Source: Result based on SPSS

Table 8. Results of market analysis management practices used by MSEs

Market analysis management practices	Average	Deviation
Market analysis	3.26	1.242
Easy appearance of competitors	4.17	.982
Follow-up on competition	3.37	1.236
Market analysis management practices	3.602	.8811

Source: Result based on SPSS

Table 9. Results of management practices with suppliers used by MSEs

Management practices with suppliers	Average	Deviation
Price-oriented selection of suppliers	4.20	.877
Quality-oriented selection of suppliers	4.53	.682
Service-oriented selection of suppliers	4.25	.793
Management practices with suppliers	4.331	.6245

Source: Result based on SPSS

Table 10. Results of direction management practices used by MSEs

Direction management practices	Average	Deviation
Attention to business trends	3.80	1.023
Reinvestment of profit	3.92	.876
Clarity on the vision	3.81	1.033
Management by objectives	3.95	.856
Advising by experts	3.44	1.160
Direction management practices	3.786	.6963

Source: Result based on SPSS

Production-Operation Management Practices

Regarding production-operation management practices used by MSEs, the approach observed is towards quality of products or services, as shown in table 13.

Management Practices on Innovation

Concerning management practices on innovation used by MSEs, it is observed that the approach is towards offering innovating products or services which make the company stand out, as shown in table 14.

Table 11. Results of finance management practices used by MSEs

Finance management practices	Average	Deviation
Cashflow planning	4.00	.912
Control over sales	4.27	.808
Control over expenses	4.18	.841
Finance management practices	4.154	.6401

Source: Result based on SPSS

Table 12. Results of sales management practices used by MSEs

Sales management practices	Average	Deviation
Search for new customers	3.73	1.100
Search for new markets	3.23	1.254
Sales promotions	3.71	1.154
Sales discounts	3.77	1.031
Adjustment to the market	3.55	1.206
Relations with customers	3.65	1.194
Sales management practices	3.609	.8531

Source: Result based on SPSS

Table 13. Results of the production-operation management practices used by MSEs

Production-operation management practices	Average	Deviation
Quality-oriented processes	4.51	.637
Processes oriented towards reducing time	4.26	.852
Cost-oriented processes	3.96	.936
Production-operation management practices	4.24	.6177

Source: Result based on SPSS

Table 14. Results of management practices on innovation used by MSEs

Management practices on innovation	Average	Deviation
Orientation towards innovation (To offer innovating products or services)	3.81	1.035
Attendance to shows, conferences. courses	3.14	1.333
Management practices on innovation	3.474	.9768

Source: Result based on SPSS

Marketing Management Practices

Regarding marketing management practices used by MSEs, it is observed that the prices of products and services are set based on customers and competition; the distribution strategy is to sell mainly to the end user and specific activities are carried out, so customers remain loyal to the company, as shown in table 15.

Management Practices on Entrepreneurial Responsibility

Regarding the analyzed aspect of management practices on entrepreneurial responsibility it is evident that companies look to promote development activities among the community in which they are located.

Table 15. Results of the marketing management practices used by MSEs

Marketing management practices	Average	Deviation
Strategies to set prices	4.25	.769
Trademark development	3.86	1.176
Strategy for distribution to end users	4.08	1.042
Sales on credit	3.11	1.266
Advertising and promotion	3.52	1.235
Customers' loyalty	3.88	1.121
Marketing management practices	3.782	.6853

Source: Result baased on SPSS

Their concern is to avoid causing, and even to solve local social problems and local suppliers are preferred over external suppliers, as shown in table 16.

Table 16. Results of management practices on entrepreneurial responsibility used by MSEs

Management practices on entrepreneurial responsibility	Average	Deviation
Promotion of community development activities	3.178	1.4400

Source: Result based on SPSS

DISCUSSION

Considering that the results showed a significant co-relation at the 0.01 level with human resources management practices, sales management practices and marketing management practices with respect to the increase in sales and all of the above plus direction management practices with respect to the increase in profit, following is a thorough explanation of these management practices used by MSEs in chaotic environments.

As the results showed, human resources management practices are focused mainly in improving productivity of the employees and it is not frequent that the companies pay salaries that are higher than those paid by other companies. The foregoing is explained by the contribution made by Cubillos-Calderon, Montealegre-Gonzalez & Caceres-Mayorga (2018, p. 199), who assure that "the micro entrepreneur is a multi-tasking worker and personnel management depends on his personal values, experience, ability, intuition and good criterion". In their selection process they generally incorporate people who are characterized for their total dedication to the organization, who have great working capacity and willingness to carry out multiple tasks so they can work in different positions in the company. Managers of MSEs focus their attention on their customers, and therefore, their collaborators must be oriented towards apprenticeship and empathy of customers and they create an environment of solidarity, trust, and commitment. Rodriguez (2012) states that human resources management practices in small organizations are different to those followed by big enterprises, since the former have limited resources and do not know the potential that the human resource has to generate sustainable competitive advantages for

the companies; the foregoing makes that aspects such as production, finance and marketing have more importance than human resources.

In so far as training is concerned, it is implemented intuitively by the managers or owners of the companies. Compensation in some cases is mixed (in cash and in kind), there are no labor contracts in writing and shifts are typical to carry out the activities. There is no formal process for performance appraisal, which is made through permanent observation. Empathy with the owner of the business, strengthening of bonding, honesty and being kind to customers, the need for a job by the collaborators and lack of abilities to perform in other productive activities become essential aspects for them to remain in the organization. Workers are important depending on the position they hold and their experience and career plans, as well as succession plans, promotions and growth expectations are lacking in these organizations (Cubillos-Calderon, Montealegre-Gonzalez & Caceres-Mayorga 2018).

As can be seen is the results, with respect to sales management practices, MSEs worry about finding and adding new customers to their companies, carrying out activities to promote sales and making discounts to certain customers in order to close sales. Regarding marketing management practices, it is worth outlining that these organizations set the prices of their products and services according to the customers and the competition, their distribution strategy is to sell mainly to the end user, and they carry out concrete actions, so customers are loyal to them. Despite facing situations of chaos such as the changes provoked by globalization, technology, and the cultural level, among others, with these actions MSEs tend to keep and have new customers, trying to meet their needs and expectations as much as possible. This is a especially important aspect since, as stated by Pachon (2016), customers, "no matter if they are the people leaving in a neighborhood", are interested in knowing in detail the products or services they will acquire, since it is essential for them to meet their expectations and needs when making a purchase.

A clear example of the foregoing is evident in the millennials' generation. These are people interested in being informed through the social media or the web on the products or services they wish to acquire to meet, not only their needs, but also their tastes. Moreover, many adults take advantage of technology to inquire on the products or services they wish to acquire, because in this way they save time when making the purchase.

For this reason, MSEs must know how to develop a specific management so they can strengthen their relationship with customers from the commercial side, no matter the situations of chaos or turbulence that may arise both within the organization and in its environment. Therefore, it is essential for MSEs to have economic and measurement resources that allow them to know their performance in their commercial management and, based on the results, to take the necessary actions that allow them to be more competitive (Pachon, 2016; Romero-Lozoya, Saiz-Aguilar, Borboa-Quintero, & Castro-Montoya, 2013).

As can be seen in the results, marketing carried out by MSEs with respect to setting prices of products or services taking into account customers and competition, the definition of strategies to sell to the end user and carrying out specific actions such as promotions and discounts, have helped these organizations to gain the loyalty of their customers and to increase their sales and profits. In this sense, Pachon (2016) suggests that when MSEs follow marketing and sales management practices, they can generate opportunities related to increase in sales thanks to the rapprochement they have with their customers. Moreover, if they strengthen their distribution channels, MSEs can have a better knowledge of their organization.

Knowing the competition is essential for MSEs when they are in turbulent environments. For this reason, entrepreneurs of this type of companies must endeavor to know the strengths and weaknesses of their competitors regarding "strategies, handling of customers, loyalty policies and added value" (p.53). On the other hand, strengthening their relations with suppliers and associations or any other strategic

allied will help them to be informed on the market trends and in this way, they can have the necessary tools to better respond to the requirements of their customers, both present and potential. Therefore, it can be concluded that, if used properly, sales and marketing management can help MSEs to obtain certain benefits such as: having the loyalty of their customers, knowing their needs and expectations, and improving the relations with their customers, which in turn reflects in the loyalty of customers to the brand or the company itself. Therefore, MSEs must be aware that the market is constantly changing and that the dynamics of their customers is to be informed on the market trends, which makes them increasingly demanding, not only of products and services of excellent quality, but of receiving an added value from the company (Pachon, 2016).

With respect to direction management practices, MSEs tend to invest the profits of the companies to make them grow and to set specific goals that the companies must reach, and this has helped them to increase their profits. It is worth mentioning that MSE entrepreneurs are usually leaders who have been able to create their own company with a lot of effort, generating employment, and if business has gone relatively well since the beginning, some of them think that changes are not necessary because, as mentioned by Pachon (2016), "there is no need for more, because we are doing well as it is".

The trend of setting specific goals is in accordance with the study made by Suarez & Zambrano (2015), who found that one of the features of the leaders of micro and small enterprises is that of defining short-term objectives, without taking into account a strategic plan that incudes tactical and strategic planning. In times of uncertainty and chaos these entrepreneurs have shown to have low tolerance because they frequently try to avoid any situation that may be considered as a risk. They look for the support of rules and regulations when facing difficult situations, especially those requiring performance control of their collaborators. Consolidating in a comfort zone where uncertainty is low is a characteristic of MSE entrepreneurs and, therefore, they do not see the need to join entrepreneurial associations or networks. Moreover, they are not interested in leading modernization processes that may help to strengthen the sector in which they operate.

The type of leadership practices by MSEs entrepreneurs is transactional, under which the collaborator meets the requirements of the director or owner of the company. Most of the time they do not define strategies to generate enthusiasm and commitment among their employees (Suarez & Zambrano 2015). As shown in the results of this research, the leaders of MSEs in Bogota are interested in improving the productivity of their employees and paying what is fair according to the sector.

CONCLUSION

This research sought to know if the management practices followed by MSEs have an effect on increase in sales and in profit. The objective was accomplished, since it was found that there is a relation between the management practices and the increase in sales and the increase in profit, even though they are in chaotic environments.

The two hypotheses set forth are proven and it is found that there is a significant co-relation at the level 0.01 with management practices related to human resources, sales and marketing and the increase in sales. Regarding the increase in profit, there is an important co-relation at the level 0.01 with management practices related to human resources, direction, sales, and marketing in the MSEs located in Candelaria, Bosa, Puente Aranda and Tunjuelito in Bogota, even though they are in chaotic environments.

The foregoing proves that these organizations that have an open-system condition (a feature of chaos), since they are in touch with different stakeholders such as customers, competitors, employees, suppliers, among others, and that are affected by situations of uncertainty resulting from globalizations, technology, customers' requirements and market trends, have been able to go from disorder conditions to situations of order thanks to their management practices, keeping their companies by increasing sales and profits.

Given the foregoing and with the contribution of Martinez-Moncaleao (2018) and Blanco-Encinosa (2005), it is confirmed that chaos in organizations in necessary for them to reach constant renovation and entrepreneurial dynamism. In this case, facing chaos with management practices have helped them to increase their sales and profit. It is important that these MSEs entrepreneurs adopt a leadership that allow them to manage in conditions of chaos, uncertainty and high instability and the first step is for them to be aware of the situation, to accept the conditions that have emerged and to adopt management practices that fit the requirements of that chaotic condition and, in this way, to achieve the expected results.

To reduce the mortality rate of MSEs involves that they must learn to move in chaotic situations, and this is when information and knowledge become cornerstones for these organizations. Although the MSEs of the neighborhoods of Candelaria, Bosa, Puente Aranda and Tunjuelito in Bogota have been able to increase sales and profit with their management practices in human resources, direction, sales and marketing, they are no exempt from improving the main flaws found, that is, short-term planning, focusing in daily work, not giving importance to generate added value to make a difference, difficulties to access the financial system and the low level of market diversification and in this way to survive chaos in a market that demands high levels of productivity and competitiveness.

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KEY TERMS AND DEFINITIONS

Chaotic Environments: Non-linearity can be highlighted among the features of the organizations as chaotic systems; that is, the lack of a rigid system that can keep them static, which moves them away from a stable equilibrium and makes them unpredictable, variable, and dynamic.

Increase in Profit: The best indicator of a company's success is profitability and the increase in its profits, which is given by the level of sales, as opposed to efficient costs and expenses, that is to say with the production and management of the business.

Increase in Sales: To reach the best level of sales to survive and to generate profit afterwards.

Management Practices: Processes slightly formal developed by the organizations to guide the entrepreneurial action and direction and to influence the behavior of people.

MSEs: Micro and small enterprises which, under decree 657 of 2019, are classified according to the economic sector they belong to (manufacturing, service and commercial) and their size is determined based on the income from annual ordinary activities represented in Tax Value Units (TVU).

ENDNOTES

1 Tax Value Unit.

2 KPI: A KPI (key performance indicator), also known as key indicator or performance measurer or key performance indicator is a measure of the level of performance of a process.

3 US Mathematician and climate scientist. He developed innovative ideas on the rotation of fluids and made important contributions that helped to understand the atmospheric dynamics and weather forecasts. He was a pioneer in the development of the chaos theory, and he introduced the concept of foreign attractors and he also coined the term butterfly effect.

4 National Association of Financial Institutions which since its creation in 1974, has played a leadership role in defending private economy and the good economic policy of the country.

5 A group of enterprises the purpose of which is to defend national production and the work of the Colombian people as a main criterion for the development of the micro, small and medium size companies, region wide.

Chapter 5
Innovation-Based Lateral Thinking and Intrapreneurship Strategies for Handling Corporate Chaordism

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ABSTRACT

The economic and social change generated by SARS-CoV-2 is leading to a new geopolitical system dominated by China and the need for higher levels of investment in R&D and innovation, especially in the health system. The world is very vulnerable to global pandemics. This chapter aims to set up several innovation-based and lateral thinking business strategies to make firms rooted in chaordism perform better in disruptive situations. In this chapter, the author will show some mixed managerial-marketing techniques to generate ideas. These pages have an eminently practical application in the firm, regardless of its size and the corporate culture applied in its daily operations.

INTRODUCTION

Firms worldwide are undergoing significant changes due to the SARS-CoV-2 pandemic that began by ending 2019 in the Chinese city of Wuhan. Due to the Chinese authorities' opacity, it is difficult to pin down the exact date and, above all, why this pandemic began. The propagation process was very fast because it coincided with the Chinese New Year, when the number of journeys through that great country is most significant, both in national and international trips. Due to the rapid spread, on January 30, 2020, the World Health Organization (WHO) declared the outbreak a "public health emergency of international concern," to later name Covid-19 as a pandemic on March 11, 2020.

The economic and social change generated by SARS-CoV-2 leads to a new geopolitical system dominated by China and the need for higher levels of investment in R&D and innovation, especially

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in the pharmaceutical and biomedical industries. Micro, small and medium enterprises (MSMEs) are especially vulnerable during the current crises because they have minimal resources and weak supply chain and business-to-business (B2B)/business-to-consumers (B2C)' relationships (Caballero-Morales, 2021). The world is very vulnerable to global pandemics given the intense degree of global interconnectedness of countries. For that reason, the world must be prepared to fight against future pandemics.

Throughout this change process caused by SARS-CoV-2, human resources and technology through the firm's digitalization play a fundamental role. However, given the growing power of customers' choice, as they move in global environments and increase online purchases, marketing plays an even more critical role in attracting and retaining the best customers. A few clients guarantee a minimum income stream necessary for the organization's survival during and after SARS-CoV-2. Hence, firms (chaordic and not chaordic ones) need to be prepared to achieve this goal.

This chapter aims to suggest some managerial and marketing tools to reduce chaordism in firms to maximize business efficiency, efficacy, and profit. The goal is to set up several innovation-based and lateral thinking business strategies to make firms rooted in caordism perform better in disruptive situations. Some mixed managerial-marketing techniques will be shown in the chapter to achieve this goal. These pages have an eminently practical application in the company, regardless of its size and the corporate culture applied in its daily operations.

BACKGROUND

Chaordism

Global changes combined with SARS-CoV-2 are affecting minor digitized sectors that are even at the risk of bankruptcy. Given this fact, more and more companies are entering into chaordic situations based on improvisation. As a result, organizational and managerial problems are patched and combined with a minimum and necessary order for not dismembering the firm. In these situations, chaos and orderism connect, and chaordism appears. Although it is part of companies' day-to-day running, chaordism has been little studied in the economic literature. In fact, there is no publication, neither in the WoS (Web of Science), EBSCO, nor Scopus, containing the term 'chaordism,' given by the difficulty in obtaining first-hand information in companies endowed with a chaordic behavior.

Why does chaordism arise in organizations? There are many reasons leading organizations to be chaordic, and, primarily, they deal with the absence of strategic planning, mainly in the medium and long term, the lack of dynamic capabilities which leads to not adapting to new day-to-day business problems, which weakens the organization, and the shortage of intrapreneurs in the firm. The lack of strategic planning as a business tool leads organizations to improvise business policies based on their daily needs. As a result, a waste of resources, both human and productive, appears, preventing the company from achieving sustainable leadership positions over time.

The chaordic behavior in organizations leads to different management policies after comparing chaordic and non-chaordic organizations. As seen in Table 1, chaordic organizations are defined by financial instability in investment processes that are not constant over time and even non-existent; sporadic customer flows; unstable provisions; and changing stakeholders characterized by instability and economic weakness. The arrival of COVID has caused an even more significant weakening of this type of company defined by a chaordic behavior, which has harmed both job destruction and the creation of

poverty. The instability caused by chaordism impacts at all levels of the organization makes the company (public and private) having more significant difficulties in competing and achieving leadership positions within the industry. For this reason, the structural transformation from chaordic to non-chaordic organizations favors the company and the external stakeholders that interact with it.

Table 1. Chaordic vs. non-chaordic entrepreneurial behavior

	Chaordic MSMEs	**Non-chaordic MSMEs**
Amortization	• Irregular	• Regular
Clients	• Open relation and variable	• Closed relation and fixed
Contracts	• Informal	• Formal
Financing	• Informal 2-F (self-financing and family) only	• Formal (banks) and informal 3-F (self-financing, family, and friends)
Intellectual Capital	• Unstable and variable	• Stable and regular
Investments	• Sporadically, if any	• Periodically
Legal aspects	• Informal • No information is given to the public administration	• Formal • Transparent information given to the public administration
Provisions	• Unstable	• Stable
Stakeholders	• Unstable	• Stable
Strategic Planning	• No	• Yes
Tax Payment	• Tax evaders	• Tax payers

Source: The author

Besides, chaordic companies are characterized by organizations striving for survival only, with no business efforts for sustainable growth. This situation is typical in developing countries, in which MSMEs prevail with all kinds of managerial problems leading to the generation of weaknesses in the organization. In these countries, MSMEs are mainly family firms, which means that, in general, they cannot compete in global environments due to financial limitations, succession problems, owner's objectives, and gender involvement (López-Chávez, Maldonado-Alcudia, & Larrañaga Núñez, 2020), and work environment problems when non-family members are being incorporated into the organization.

One of the main problems in countries with chaordic companies is tax evasion, which negatively includes the redistribution of wealth, reducing the public deficit, and the failure to provide social services to the needy public. As a result, corporate chaordism leads to the generation of vicious circles that generate economic underdevelopment and significant social differences between the richest and poorest in society as there is no broad middle class. A large middle class defines the state of socio-economic development of developed countries. The social differences are slight, especially in the so-called welfare states in the European Union, where it is reduced the percentage of extreme poverty in its population.

A second aspect to consider in chaordic organizations is the instability they generate in establishing stakeholder networks that are unstable over time. As a result, trust between the different actors that interact in the market decreases, negatively impacting the quality of the employment generated. A more outstanding operational order in chaordic organizations would lead to greater predictability in their actions, which would benefit the company and clients and the sector and industry where the firm operates.

From a vision of intellectual capital, conceived as the sum of human capital, relational capital, and structural capital, when chaordism reigns in the company, it tends to generate labor absenteeism, which deteriorates the professional relationship between clients and the intellectual capital working in the firm. As a result, business reputation, corporate image, and commercial brands are all damaged. The deterioration of this business reputation causes the loss of the best workers and managers, who can even startup a firm. As a result, stakeholders tend to stop doing business with the old company, leading to the loss of leadership positions, which are often difficult to obtain later and attract its most valuable productive resources again, workforce included.

Human resources are the most important asset of organizations with crucial importance in MSMEs, both in necessity entrepreneurship and opportunity entrepreneurship. For this reason, the company needs to ensure that its human resources have an adequate entrepreneurial education that they can then apply in their organizations. An enterprise without continuous improvement in education, in the long term, is an MSMEs doomed to failure, with its corresponding business bankruptcy, or to languish over time in a context of survival.

Furthermore, the acquisition of adequate entrepreneurial training leads to a reduction in chaordism within the organization's chaos because the employer has designed strategic plans and policies that lead to harmonious and stable organizational development. For this reason, this improvement process must be carried out with the combination of public and private policies, to thus, within this process of public-private collaboration, be able to achieve higher levels of growth and the creation of employment and wealth.

Business creation is one of the main factors to generate social change. Business creation in contexts of uncertainty, strategic planning, innovation, technology, and dynamic capabilities are of fundamental importance. We will analyze it in the following section.

SOLUTIONS AND RECOMMENDATIONS

Lateral Thinking

Lateral thinking is defined as using methods of thought concerned with changing concepts and perception (Butler, 2010), so it is directly linked to creativity and teamwork to set strategies and business rules for achieving entrepreneurial success. In 1967 de Bono coined the term "lateral thinking" to think beyond existing boundaries to awake curiosity and break away from rational, conventional ideas and formalized procedures (Hamza and Hassan, 2016; Sefertzi, 2000). Many entrepreneurial techniques are based on lateral thinking (brainstorming, SCAMPER, the six thinking hats, laddering,...), and they are widely used in organizations worldwide. Thanks to these entrepreneurial techniques, firms remove obstructive concepts to set business strategies for growth and welfare creation by losing away the logical thinking route and the daily routines carried out by firms.

To develop and put into action one or several business strategies based on lateral thinking, it is necessary to convince the working team to contribute with original and disruptive ideas to benefit the organization. In this way, the human team becomes intrapreneurs, and corporate social innovation is strengthened by applying sustainable entrepreneurial ecosystems (Saiz-Alvarez, Huezo-Ponce, and Palma-Ruiz, 2020).

Managers who use techniques based on lateral thinking have a greater capacity for vision and analysis of the problems and imbalances to be solved within the organization. Therefore, they tend to have a

particular order, which avoids chaos within organizations as managers constantly control the company. Hence, to apply lateral thinking, it is necessary to carry out previous training courses for all those involved in the decision-making process so that the techniques are profitable. For this reason, the use of these techniques is carried out, in general, more in large companies and multinationals, where the issue of social, environmental, and economic dimensions are closely linked and defined, more than in microenterprises and SMEs.

The Importance of Strategic Planning

Non-chaordic firms are defined by establishing sound business policies based on strategic planning touching environmental issues. Companies play a fundamental role in the fight against environmental deterioration, so when they carry out environmental conservation policies, they are rewarded by stakeholders and, above all, by their clients who contribute in social networks, among other means, to improve the image and corporate reputation of the organization. In this respect, Yasir, Majid, and Qudratullah (2020) suggest that organizations are required to focus on stakeholders' requirements and strategies that ensure the protection of the natural environment. Hence, environmental orientation regarding internal exposure and external orientation is pertinent to formulate green business strategies to improve environmental performance.

In non-chaordic organizations, green business strategies are part of corporate policies based on strategic planning. As strategic planning benefits marketing capability (Agyapong, Essuman, & Afia Kesewa Yeboah, 2021), prospective clients can be easily attracted to the firm, increasing cash flow and strengthening EBITDA (Earnings Before Interests, Taxes, Depreciation, and Amortization) in the firm.

Also, organizational agility and business flexibility positively affect firm performance, business learning, and sustainable growth. In this respect, Kornelius et al. (2021) show that combining business agility and corporate flexibility to face market challenges quickly and organizational responsiveness to face external competition constitutes strategic maneuverability that derives into positive direct and indirect effects attract customers and external investment. As a result, learning processes arise to foster internal process performance and business growth.

Faced with these corporate advantages in non-chaordic firms, chaordic organizations (public and private) have higher difficulties surmounting corporate imbalances. This lack of strategic planning is typical in MSMEs, predominantly in developing and emerging countries where business leaders, generally founders, have insufficient academic training, so they only try to replace it with professional experience. Higher training levels are crucial to overcoming this situation because education, especially in developing countries to grow.

The lack of technical knowledge harms entrepreneurs located in developing and emerging countries in their daily operations, as they do not have a "glocalization"- based vision. Indeed, glocalization (think globally, act locally) allows companies to anticipate future competitors and market development, where digitization processes are crucial. Regardless of their size, companies compete directly or indirectly in global markets defined by optimizing value for money to achieve long-term sustainable growth.

Sustainability in its triple sense (financial, economic, and environmental) is becoming increasingly crucial in non-chaordic companies. When combined with strategic planning, productive resources are optimized, allowing reaching higher levels of socio-economic well-being. As companies located in developing and emerging countries are chaordic, in the absence of adequate strategic planning by MSMEs, it is more difficult for these countries to achieve higher levels of social well-being.

As a result, to transform chaordic into non-chaordic organizations, firms should improve monitoring, handling conflicts, and selecting connection downsizing among networking routines (Mitręga, & Choi, 2021) when initiating partnerships by signing contracts to lessen chaordism and improve organizational learning. In fact, Lo and Sugiarto (2021) show that managing pattern and stability, detecting discontinuity, and knowing the business have a positive but weak effect, whereas reconciling change and continuity proves to have a positive and significantly strong impact on organizational learning.

One key agent in this ameliorating business process is the public administration. Especially in developing and emerging countries, public intervention is positive only if corruption-based decision processes are eliminated, since one of the main problems of developing and emerging countries is political corruption, especially when political decisions are mixed with economic and business decisions as, unfortunately, is very common in these countries. For example, Gámez, Saiz-Alvarez, and Gil (2017) show that, in Colombia, 54 out of every 100 entrepreneurs with no formal education approve corrupt behavior, mainly related to marketing processes in their organizations; 40 out of 100 nascent entrepreneurs (0-3 months in business operations) approve corruption in production processes; 30 out of 100 entrepreneurs with secondary education do not differentiate between corruption and ethical behavior when implementing administrative models in their firms, and 35 out of 100 entrepreneurs do not have negative emotions when committing unlawful acts or violating rules related to business.

Given these high levels of corruption, chaordism arises in these media as a means of business survival, given the existing informality. As a result, there is no control over the volume of sales or purchases, especially in informal commerce, which has learned to live on a day-to-day basis without expecting a change in this type of behavior. This chaordic business reality is observed in developing countries' street vendors, without this situation has barely changed in decades.

The fight against corruption (public and private) and implementing business policies based on strategic planning can lay the foundations to solve a problem that breaks with equal opportunities and social justice. The elimination of corruption in developing and emerging countries can lay the foundations for attracting foreign investment, creating jobs and wealth for society. In this changing and empowering socio-economic process, it is essential to highlight that, in this process of public-private collaboration, public administrations must avoid expansionary fiscal policies via taxes since a higher tax pressure discourages companies' creation and, consequently, stable employment with fair wages and agreed between employers, unions (where appropriate) and the workforce.

Innovation-Based Business Strategies

Complementary to the fight against corruption and the adoption of business policies based on strategic planning, innovation-based business strategies are vital for transforming chaordic organizations into non-chaordic ones. In fact, the lack of investment in technology generally gives one of MSMEs' main problems located in developing countries. Consequently, production and commercial processes are labor-intensive, which causes low (or non-existent) automation levels.

Corporate innovations and new technologies allow organizations to grow, function, work and develop in an ever-changing and challenging business environment (Borowski, 2021). Also, innovation generates first-order economic advantages in terms of sustainable R&D, which benefits firms worldwide. Technological spillovers shift the composition of corporate research and development by promoting innovation based on exploiting existing knowledge to explore new areas for opening new business opportunities

and attaining intellectual capital, which are essential drivers for breakthrough technology advancement (Byun, Oh, & Xia, 2021)

Innovation-based processes make firms grow and survive in chaordic scenarios. Only the lack of intellectual capital with a minimum and necessary technical formation, knowledge, and working experience impedes the transformation of a chaordic firm into a non-chaordic organization. As a result, the development gap is enlarging between developed and developing countries, although the economic and business efforts made to reduce this gap.

Linked to innovation-based business processes, sustainability is critical for business success to create a circular economy to benefit society and firms. This objective is especially visible in developing and emerging countries, most of which suffer from corporate policies based on social and ecological dumping, hurting both populations and local companies. As a result, from the existing organizational classification related to the circular economy for firms (frontrunners, fast followers, a late majority, and laggards (Holzer et al., 2021), MSMEs located in developing and emerging nations are mainly laggards. Besides, Pieroni, McAloone, and Pigosso (2021) affirm that the market penetration of business models based on circular economy is limited in most manufacturing sectors due to shortcomings in business capabilities to create business models based on a circular economy. The challenging factors in the circular economy are cooperation, trust, and transparency. Therefore, to achieve sustainable results, collaboration and openness between organizations within networks and value chains are required (Zhang et al., 2021).

Business cooperation is essential when competition appears. The fierce competition generated by economic globalization led companies to strive towards operational excellence by improving business efficiency to reduce downtime rates and meet higher market demand levels. New markets are achieved due to attractive quality and low-priced products and services (Roy, Kumar, & Satpathy, 2021). Chaordic organizations are exempted from this sustainable growing firm, especially when multi-unit back-end problems happen when internal business units who consider themselves rivals are asked to collaborate to launch an open innovation initiative successfully. To solve this problem, rival business units must align their front-end and back-end when working with startups to accelerate their digital transformation program (Seran & Bez, 2021). When chaordic MSMEs integrate business cooperation, sustainable policies, innovation-based business strategies, and technology, dynamic capabilities appear, and chaordic firms will be transformed into non-chaordic ones. We will analyze the effect of dynamic capabilities in MSMEs in the next section.

Dynamic Capabilities

When human resources and technology are combined, human resources technology appears. Barman and Das (2019) define human resources technology as the technology used to attract, hire, retain, maintain human resources, and optimize human resources' administration and management. Especially in developing and emerging countries, technology was a luxury in the past, but today it is necessary. MSMEs located in developing and emerging nations are out of adapting advanced technological tools, such as Artificial Intelligence, Cloud Computing, and Machine learning, among others. Advanced technologies focused on improving firms' management to increase business efficiency that are only available, in general, for organizations located in developed countries.

Human resources technologies can affect dynamic capabilities and business efficiency. In fact, business efficiency allows firms to compete in the market by optimizing productive resources and achieving sustainable wealth creation to benefit stakeholders. Also, dynamic capabilities affect firms' digital

innovation positively by creating new offerings, processes, or solutions with the use of a wide range of digital technologies (Tortora et al., 2021)

Dynamic capabilities enable organizations to create, modify, and reconfigure their available human and economic resources to compete in challenging market environments. Combining business collaboration and human performance is critical for building dynamic capabilities (Kumar, Meena, & Difrancesco, 2021). As a result, a proper dynamic capabilities framework has emerged as a helpful tool for managers to develop better and manage intrapreneurial capabilities (Klofsten, Urbano, & Heaton, 2021).

Weaven et al. (2021) distinguish three dimensions of dynamic capabilities, namely sensing (business assessment and information acquisition), seizing (product portfolio decisions and investment in technologies and human resources), and reconfiguring (innovation, decentralization, and knowledge management). When these three dimensions are impulse simultaneously, organizations achieve sustainable growth. Firms also defined by non-chaordism, as they apply pre-planned and approved business policies based on defined business goals.

Combining dynamic capabilities and knowledge management develops competitive entrepreneurial advantages and affects firms' ambidexterity, reflecting firms' ability to conduct synchronous exploration and exploitation of business activities (Santoro et al., 2021). When MSMEs lack entrepreneurial ambidexterity, their business growth process stops, leading to the risk of more dynamic competitors appearing in the short and medium term that will drive the company out of the market. To avoid this problem, the company has to keep innovating and strengthening its dynamic capabilities. An objective achieved with the beginning of a continuous training system and a growing specialization to maintain a captive market within the locality, region, or country in which it operates.

Besides, Filser et al. (2021) show that sustainable and dynamic capabilities in MSMEs are the most promising business model innovation trends. Applied to MSMEs operating in developing and emerging countries only, dynamic capabilities can be fostered when linked to educational processes.

Given the characteristics of the current market, primarily determined by the health, economic, and business effects of SARS-CoV-2, former MSMEs that wish to survive are digitized to encompass broader markets and continue to meet the purchasing needs of the clients. In this respect, Widianto et al. (2021) show that the organizational capacity for change mediates dynamic managerial capabilities and organizational performance. As a result, entrepreneurs and practitioners must develop the necessity for change to achieve sustainable growth. If there is no need for change, the company will not evolve towards its development over time. A situation that is especially visible in MSMEs given their small size and the number of employees is usually tiny.

MSMEs in developing and emerging countries follow performative routine organizational behavior, demonstrating the flexibility and context-dependence in deploying dynamic capabilities. Associated with dynamic capabilities, founders have unique micro-foundational capabilities to perceive social challenges and opportunities (De Silva, Al-Tabbaa, & Khan, 2021) linked to markets, stakeholders, and prospective clients. These innate dynamic capabilities allow entrepreneurs to have a business vision that complements the search for opportunities. This lack of entrepreneurial vision causes many entrepreneurs to fail (50% at the end of the first year) mainly due to planning errors and lack of funding to continue developing the business. Therefore, the lack of this entrepreneurial vision makes it very difficult, especially if there is neither previous training nor work experience, to become successful entrepreneurs in the long term.

When dynamic capabilities are developed, and the individual can grow the business having a double internal and external vision, they become an intrapreneur. Intrapreneurship gives an additional value to the organization because improvements can be achieved in producing and marketing the goods and

products offered to the market and reducing operating costs to design and implement further operational improvements in the production and marketing chain. We will see these aspects in the next section.

Intrapreneurship

Intrapreneurship has been characterized as an entrepreneurial behavior focused on generating innovative activity (Audretsch et al., 2021) resulted from the generation and implementation of new ideas to enhance entrepreneurial competitiveness. Intrapreneurship is born from workers' and work teams' work experience, so the company must reduce job rotation. In the case of MSMEs, such job rotation tends to be minimized because the employer, on many occasions, is not willing to assume the costs of a new establishment, which makes it conservative in its decision-making.

Directly linked to intrapreneurship and knowledge, absorptive capacities are an essential part of firms' intrapreneurial capabilities. Zahra and George (2002) define absorptive capacities as a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability. Competitive and non-chaordic organizations are especially active in generating absorptive capacities to be successful in the long term. The key in this entire process of change and search for opportunities is obtaining quality information that is reliable, trustworthy, and reliable. Information is power, be it economic, business, and even political. The company with the most quantity and quality of information will obtain competitive advantages that can lead the organization to leadership positions in its industry if it maintains them over time.

When absorptive capacities are linked to innovation, it strengthens its competitiveness, regardless of its size. For this reason, Davis and Bendickson (2021) demonstrate that dynamic capabilities partially support innovation in MSMEs and large firms, making strategic planning valuable for innovation in MSMEs. Since absorptive capacity reflects an organization's ability to extract innovative ideas from its environment, it plays a critical role in fostering intrapreneurship and creative performance within existing firms, as individuals' learning and proves orientation are significant predictors of their absorptive capacity, and that individuals' aggregate absorptive capacity would lead to positive innovation outcomes especially when their activities are highly coordinated (Emre Yildiz et al., 2021)

Also, the organizational structure has a positive effect on considerable firm innovation. Companies with low (or no) X-inefficiencies lead to rapid (and practical) decision-making, which leads to the generation of growing cash flow and EBITDA in the organization. Also, leadership increases organizational effectiveness and cash-flow generation (Akuffo & Kivipõld, 2021). As a result, a virtuous circle has been created with feedback between good decision making, organizational effectiveness, and leadership that benefits the company and guarantees its survival in the market.

Both organizational effectiveness and employee intrapreneurship positively influenced innovation performance (Wan, Liu, & Wang, 2020) to benefit stakeholders. As a result, motivating employees' intrapreneurial behavior has become a critical factor in improving innovation (He, & Hui, 2020) and as a factor for strengthening the human team working in the organization. The human team differentiates organizations from other competitors, which leads the company to try to achieve quality seals with a good work environment, such as the GPTW (Great Place to Work) seal.

Intrapreneurial skills and innovation are reinforced with STEM (science, technology, engineering, and mathematics) intellectual capital (van Wetten, Gerards, & de Grip, 2020), as there is a positive relationship between intrapreneurship, psychological capital, and work engagement (Pandey, Gupta, & Hassan, in press). STEM studies have been reinforced in developed countries after its insertion in

structural transformation policies of the industry. Industry 4.0 is demarcated by digitization, progressive robotization, automation, data exchange, and remote industrial work in the case of occupational hazards. Consequently, Industry 4.0 will tend to increase labor productivity, R&D, and innovation. Also, it will tend to improve the lives of customers and workers. However, almost all MSMEs operating in developing and emerging countries are exempt from this business reality.

Intrapreneurship can be defined and learned by labor expectations (Begeç, & Arun, 2020). When working expectations are positive, after having launched a straightforward, rewarding, and, above all, fair, professional career, individuals are pushed into intrapreneurship. For this reason, intrapreneurship is easier to occur in environments defined by suitable working environments and labor solidarity based on mutual aid. Besides, intrapreneurs increase corporate and brand reputation, which benefits all stakeholders. Intrapreneurship is much cheaper (and sometimes accessible) than open innovation because, in open innovation, external companies and organizations interact when starting projects or improving processes, which usually means high costs. With intrapreneurship, improvements and suggestions are made by the company's workers, which does not lead to additional charges.

However, the relationship between employees' perceptions of high-performance work systems and intrapreneurial behavior does not directly occur. Alternatively, this relationship happens through knowledge and skills sharing among employees (Escribá-Carda, Revuelto-Taboada, Canet-Giner, & Balbastre-Benavent, 2020). In this intrapreneurial process, specialized education plays a key role; therefore, it is necessary to update courses within the specialization area constantly. Current and prospective intrapreneurs generate ideas to help organizations internally, unlike open innovation.

Opposed to internal intrapreneurship, international social purpose organizations (ISPOs) have the dual mission of social and economic value creation (De Silva, Al-Tabbaa, & Khan, 2021), and impact outside the organization. Besides, and given the higher education rates in developed countries, intrapreneurship tends to be more active in multinationals, primarily headquartered in developed countries.

Finally, environmental preservation plays a crucial role in the intrapreneurial process, especially in societies with a high environmental awareness. In this sense, the European Union (EU) is an example to follow. Reducing the ecological pressure along with the products and services' life cycle, increasing efficiency in consumption, reducing waste, the use of renewable materials, and transforming the production system into a circular economy and a climate-neutral model are the core of the EU's Circular Economy Action Plan and the Bioeconomy Strategy (Gatto & Re, 2021). Innovation in greener solutions and rethinking economic systems to benefit the environment and society are crucial to attaining sustainable business growth to leave a better world for future generations, where chaordic behaviors tend to decrease.

Entrepreneurial Education

One of the most critical problems of MSMEs is the absence of a minimum educational degree in entrepreneurial education. Guerrero and Urbano (2017) state that universities are fundamental in entrepreneurship and innovation ecosystems. However, developing and emerging countries are characterized by not having, with few exceptions, strong educational structures working in collaboration with the public administration and corporations to create triple-helix schemes and promote entrepreneurial education.

Digital markets dilute space and time boundaries, more easily connecting buyers and sellers and transforming the consumption model, where sustainability and ethical choices have a greater weight. Education plays a crucial role in equipping people with the skills, knowledge, and skills necessary to prosper in entrepreneurial personal, and professional life. Digitization is making entrepreneurial edu-

cation evolve to be adapted to challenging business scenarios to take advantage of new technologies, tools, and strengths while addressing concerns about potential abuses, such as fraud, identity theft, or cyberbullying (OECD, 2019).

Numerous advantages are achieved when entrepreneurs internalize other entrepreneurs' knowledge and experiences who work, or not, in their same industries. Thus, the internalization of new knowledge allows entrepreneurs to go from a solely local vision to a "glocal" one. They begin to think globally and act locally in their decision-making. This perspective allows entrepreneurs to make fewer mistakes and anticipate their competitors' future movements to face them in time.

A second advantage derived from entrepreneurial education is that entrepreneurs can be fully updated on the operations and movements of other companies operating in their sector, allowing entrepreneurs to visualize business opportunities and cope with tremendous success in their survival in the market. Besides, entrepreneurial education will enable companies to adopt new techniques, policies, and strategies to apply within organizations, leading to growing corporate strength in the medium and long term.

Entrepreneurship education is usually carried out in collaboration between higher education institutions (HEIs) and companies. The latter, especially if they are MSMEs, typically do not have the means or knowledge. For this reason, and to increase the impact of this type of education, public administrations also participate with aid and scholarship programs, thus giving triple helix models between HEIs, companies, and the public sector.

Entrepreneurial education increases entrepreneurship's desire, but entrepreneurial intention tends to decrease with income (Saiz-Alvarez & Rodríguez-Aceves, 2019). This fact is given because entrepreneurship in developing and emerging countries tends to be done out of necessity. Once vital needs are covered, entrepreneurs in these countries do not usually desire to take more risks. As a result, companies tend to reduce their investments in new technologies and expand equipment and facilities. The beginning of technological obsolescence and the organization's non-expansion policies lead to a loss of competitive advantages in the medium term, leading to business stagnation.

The arrival of successors in family businesses and, where appropriate, professionals outside the organization can break this trend to make the organization less conservative and aggressive in conquering new markets or expanding existing ones. For this, it is essential to have minimum levels of education in entrepreneurship to achieve this objective. However, these business expansion processes have to be marked by prudence, avoiding excessive risk exposure to avoid putting the organization in danger of bankruptcy.

This almost absence of entrepreneurial education joins a second problem defined by the gender difference in entrepreneurial behavior. After having interviewed 342 entrepreneurs from 15 Latin American countries, Ilie-Cardoza and Cardoza (2018) show that there is a positive correlation between the performance of the entrepreneurship index and the generation of wealth, for which they advocate the establishment of programs more specific entrepreneurial training, professional mentoring services and better financing systems. However, the gender difference is essential in developing and emerging countries, which discourages female entrepreneurship. Thus, in the case of Latin America and the Caribbean, according to these authors, 22.7% of female entrepreneurs are divorced or separated, as opposed to 7.9% of men with the same marital status. 59% of female entrepreneurs in Latin America have a business education, compared to 70% of men, 27.8% of women have suffered some gender discrimination when doing business, and 50.6% consider that men have more entrepreneurial opportunities than women.

This gender difference in entrepreneurship leads developing and emerging countries to miss out on growth opportunities, job creation, and wealth. Added to this is the macroeconomic instability of these countries and regions, which leads to nascent companies having little expectation of surviving in weak

Table 2. The 2020 corruption perception index (CPI) in BRICS and Bloomberg's emerging countries

CPI Rank	Country	2020	2019	2018
BRICS				
94	Brazil	38	35	35
129	Russia	30	28	28
86	India	40	41	41
78	China	42	41	39
69	South Africa	44	44	43
BLOOMBERG'S EMERGING COUNTRIES				
92	Colombia	39	37	36
124	Mexico	31	29	28
104	Thailand	36	36	36
33	South Korea	61	59	57
28	Taiwan	65	65	63
57	Malaysia	51	53	47
102	Indonesia	37	40	38
69	Hungary	44	44	46
25	Chile	67	67	67
86	Turkey	40	39	41
115	Philippines	34	34	36
45	Poland	56	58	60

Source: Adapted from Transparency International (https://www.transparency.org/en/cpi/2020/table/nzl) and www.bloomberg.com

and unstable socio-economic environments, thus making the corporate mortality rate more than double that of developed countries (Valenzuela, Valenzuela, & Irarrazaval, 2018).

Along with the absence of entrepreneurial education and gender differences in entrepreneurship, the third most crucial problem that prevents a harmonious development of companies in developing and emerging countries is their high corruption rates existing in these nations. In this respect, Zhao, Ahn, and Manoharan (2021) find that e-government development effectively reduces corruption in countries with cultural characteristics based on individualism, searching for business security, and e-government development. In fact, e-government allows public administrations to have greater control over entrepreneurs' and companies' activity, which reduces the levels of corruption in the countries, although still very high in developing and emerging countries (Table 2). Getting rid of corruption will require an institutional "big push," one that revamps de facto law enforcement capabilities under solid political leadership and with society's support, including free and active media (Spilimbergo, & Srinivasan, 2019).

According to the CPI, there is an extreme disparity between developing and emerging countries due to economic, social, political, historical, and cultural reasons. Therefore, it cannot be said that there is a single pattern to explain the corruption level appearing in these nations. As a result, the fight against corruption has to be done individually within each country, with education in values (adapted to their moral, ethical, historical, economic, social, cultural, and religious contexts) being the factor that all these countries should apply.

Regarding corruption, Saha and Sen (2021) show that many East-and-Southeast-Asian countries either achieved or currently are achieving impressively rapid economic growth despite widespread corruption – the so-called East-Asian-Paradox. A common feature of these countries was that they were autocracies. Alternatively, these authors demonstrate that democracy is not suitable for growth if there is a high level of perceived corruption. The same situation happened in the 1960s decade in Spain and Portugal when these autocratic countries (till 1975 in Spain and 1968 in Portugal) achieved the highest economic growth ever in the so-called Spanish and Portuguese economic miracles, respectively.

Corruption harms economic growth by reducing investment (Saha and Sen, 2021; Reinikka and Svensson, 2005; Keefer and Knack, 1997) and by diverting expenditures away from growth-enhancing areas (such as education and health) towards corruption-intensive sectors (such as infrastructures) (Saha and Sen, 2021; Mauro, 1997; Tanzi and Davoodi, 1997). Therefore, it is essential to eliminate such corrupt practices to achieve the appropriate investments, creating employment and wealth for society.

Luczkiw (2008) affirms that entrepreneurial education is living an age of chaos, complexity, and disruptive change in countries defined by an inexistent collaboration among government policymakers, entrepreneurs, and educational leaders. A more vital and disruptive partnership is needed, which requires a strong sense of mutual trust to accept a diversity of ideas and be adapted for success. As a result, human resources in firms need empathy, flexibility, and a compelling vision of achievement, improvisation, communication, and inspiration to foster social change, educational achievements, welfare, and economic growth.

Regardless of their public or private ownership, «HEIs have been affected by three major developments since the 1980s: globalization, growing demands of lifelong learning and fast and intense developments in ICTs (information and communication technologies) (…) Since universities' ultimate responsibility to prepare human resource pool for the challenges of a constantly changing future, universities must change and continuously develop following this changing environment (…) These changing conditions, adaptation to these conditions, preparation to the future is the greatest cause of chaos for todays' universities» (Tuncer and Açikalin, 2015, p. 5) to be transformed into intelligent HEIs defined by fostering R&D plus innovation, impulsing virtualization, and teaching mobility, inserting organizational culture, and develop a sense of pride of belonging into their stakeholders rooted into a solid and well-grounded reputation.

Educational organizations not facing these challenges end in chaos, so they cannot survive in the long run. Students' attraction is based on reputation, making chaotic the educational institutions endowed with low reputation.

CONCLUSION

The SARS-CoV-2 pandemic has a more profound impact on MSMEs in developing and emerging economies because they have minimal resources and vulnerable supply chain and business-to-business/business-to-clients relationships. Combining innovation and better use of their limited available resources is one solution to overcome the present economic crisis (Caballero-Morales, 2021).

Innovation-based processes make firms grow and survive in chaordic scenarios. In developing and emerging countries, MSMEs tend to behave chaordically due to the absence of corporate strategies, informality, and very short-term operations following business survival mechanisms. This behavior based on chaordism prevents the organization from growing sustainably over time and weakens it in the face of external shocks.

The solution to this entrepreneurial weakness is given by implementing educational policies focused on improving business management based on entrepreneurial education and encouraging public-private collaboration to strengthen the productive and commercial structures of the countries. HEIs play a fundamental role in this entrepreneurial education process, so it is necessary to create triple helix schemes (university, public administration, and business) that create synergies and facilitate economies of scale and economies of scope for all participants in it.

In general, MSMEs in developing and emerging are defined by the absence of a minimum educational degree in entrepreneurial education. The design and implementation of triple helix schemes between HEIs, companies, and public administrations must initiate transformation and structural improvement from within organizations. This transformation process will impact the entire industry and, by extension, the economy.

The effects of this entrepreneurial transformation rooted in education should be dispersed efficiently in society. The gender gap in entrepreneurship should be reduced to achieve this goal, and dynamic capabilities must be reinforced, primarily when directed towards environmental preservation. This transformative process must take place in the context of the fight against corruption. Only when corruption has diminished, the positive effects of said transformation are defined by a capillarization effect that benefits society as a whole and in a harmonious way to achieve, as a final result, a greater degree of economic and social well-being for humankind.

FUTURE RESEARCH DIRECTIONS

Future research will address the importance of gender in intrapreneurship and how corruption influences dynamic capacities within organizations, mainly MSMEs, as crime discourages entrepreneurs' working efforts. Women's importance is increasing in firms, but their working effects on the organization and the family have not been studied intensely. A better understanding of this relationship would lead to the more successful implementation of work-life balance policies.

A second research line will be to analyze if MSMEs and multinationals are both equally affected by corruption practices and, if appropriate, propose some socio-economic and political strategies to eliminate it, or at least to minimize it, through entrepreneurial education. Although traditional corruption has been blamed on developing countries, the arrival of COVID19 has also strengthened corruption in developed countries. New corruption practices are born to guarantee the survival of the organization in hostile environments where the sanitary confinement of the population by the virus has led to a drastic reduction in sales and the generation of cash flow and profit. Therefore, it is attractive for the author to study the relationship between business corruption and COVID when the pandemic is controlled, and optimally reduced, and ideally eliminated.

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KEY TERMS AND DEFINITIONS

Absorptive Capacities: They are the organizational ability to value and apply new knowledge and strategic policies for improving organizational learning.

Chaordism: It is the combination of chaos and orderism in organizations.

Dynamic Capabilities: A sort of capabilities that enable organizations to create, modify, and reconfigure their available human and economic resources to compete in challenging market environments.

Economies of Scope: They are minor modifications made to the product to reach broader market niches.

GPTW: Acronym of Great Place to Work, it is a seal granted by an organization dedicated to conducting surveys of the intellectual capital that works in companies to find out employees' opinion and, where appropriate, promote continuous improvement of companies.

Intrapreneurship: It appears when self-motivated and proactive employees act as entrepreneurs when proposing strategies to improve their productivity, reduce waste, and diminish efforts made by workers laboring in the firm.

Scale Economics: They are defined as reducing production costs from making and selling goods in large quantities.

STEM: Acronym of Sciences, Technology, Engineering, and Mathematics; it determines the future professions, especially in developed countries.

Chapter 6
The Appreciative Inquiry Methodology as an Instrument for the Analysis of the Sustainability of Companies

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ABSTRACT

There are currently various social innovation practices and efforts to address sustainability and its impact on the world. One of them is the use of the appreciative inquiry methodology (AIM), which results in applying a SOAR analysis focused on sustainability and discovering the strengths, opportunities, aspirations, and results of a company. Thus, the company plays a fundamental role through corporate social responsibility (CSR) that seeks to carry out concrete actions that benefit society. This chapter will define what this methodology consists of, its scope, uses, and initiatives that have adopted it as part of their practices for the measurement and promotion of sustainability. One of the main results of using this methodology is to share success stories about innovations that meet the Sustainable Development Goals (SDGs) through organizations such as AIM2Flourish and B Corp.

INTRODUCTION

A healthy organization, in turn, involves two implicit concepts: organization and health. On the one hand, "organization" generally refers to how work processes are structured and managed, including job design, work schedules, management style, organizational effectiveness, and corporate strategies to help employees adapt. In that sense, "the positive power of AIM with its concepts of the more fully human organization — a collaborative, intrinsically motivating system capable of liberating the human spirit without reverting to tired, old, command-and-control forms of bureaucracy" (Stavros, Torres, & Cooperrider, 2018, p. 4).

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It is essential to use innovative tools such as the Appreciative Inquiry Methodology (AIM), focused on sustainability, and analyze examples of organizations that promote global benefit by promoting acceptable practices through various initiatives. Furthermore, based on what was stated by Laszlo & Sorum Brown (2014), it is essential to redefine sustainability as flourishing, because in their words, "sustainability has run out of steam, we need not only a better meaning but a better world, one that points to fresh practices and the possibility of far better results—flourishing at all levels-individual, team, organizational, and global. Think of flourishing relationships, radiant health, thriving enterprises, and humming communities" (p. 9).

In companies, it is common to think or believe that something must change, or we must solve a "problem". However, organizational development has been evolving and presents an intervention alternative that is the AIM. Kuzmina & Lindemane (2017) affirm that "there is a general impression that management should look beyond traditional financial metrics to include CSR– related factors because several groups are led by different motivations and expectations" (p. 40).

In that sense, AIM looks for what works in an organization; in other words, it is focused on the highest points. Since claims are based on experience and history, people know how to repeat their success (Hammond, 2013).

BACKGROUND

Dr. David Cooperrider and Dr. Ron Fry developed AIM at Case Western Reserve University in the late 1980s. Their work helped create a positive revolution in organizational change and built a framework used by organizations worldwide to flourish (AIM2Flourish, 2021).

Subirana and Cooperrider (2017) defined the five phases that AIM goes through, which according to their analysis, is a cyclical process.

- **Define:** The explanation of the topic is crucial; there are guidelines for designing appreciative, powerful, and generative questions.
- **Discover:** To identify what is life-giving in the organization and appreciate the best of "what is".
- **Dream:** To visualize the results of what drives us forward (purpose, strategic focus).
- **Design:** To plan the ideal situation or organization to achieve dreams.
- **Destiny:** To ensure that dreams can come true.

To understand AIM, it is essential to define what it is. Based on Grieten, Lambrechts, Bouwen, Huybrechts, Fry & Cooperrider (2018), "AIM is a collaborative and constructive inquiry process that searches for everything that gives life to organizations, communities, and larger human systems when they are most alive, effective, creative and healthy in their interconnected ecology of relationships" (p. 1). Thus, through this methodology, the strengths and what is already working in an organization are discovered, instead of traditional approaches focusing on problems.

Appreciative Inquiry first emerged in the early 1980s. David Cooperrider conducted an organizational diagnostic of the Cleveland Clinic to determine what was wrong with the way the organization was operating. He found that an "appreciative" approach was being used that was causing a powerful and creative stir within the organization. He realized when he asked about what was working that the dynamics of the conversation completely changed (Watkins, Mohr, Kelly, 2011). David Cooperrider

is then the main contributor and creator of Appreciative Inquiry. He is currently conducting various investigations to further delve into this methodology, collaborating with other researchers.

In practice, AIM has built on this strength-based premise and drawing on the science of positive psychology to help understand why AI has been so powerful in large-scale OD efforts. One of the significant findings is that the study of optimal human system states does not just signal what enables thriving, peak performance, or full-spectrum flourishing. That is only part of the story. The bigger story is that the focus on optimal states actually propels and empowers even more change capacity (Cooperrider & Fry, 2020, p. 267).

WHAT IS APPRECIATIVE INQUIRY METHODOLOGY?

The AIM philosophy is captured in five Basic Principles that serve as the foundation for the five generic AI processes:

- **The Constructivist Principle:** Our organizations evolve in the direction of the images we create based on the questions we ask as we strive to understand systems at work.
- **The Principle of Simultaneity:** Change begins the moment we ask the questions.
- **The Anticipatory Principle:** Our behavior in the present is influenced by the future we anticipate.
- **The Poetic Principle:** just as poets have no restrictions on what they can write, we have no limits on what we can inquire about and learn from it.
- **The Positive Principle:** the more positive the questions used to guide a change process, the more lasting and effective it will be. (Watkins, Mohr, Kelly, 2011).

AIM is not about being or thinking positively or negatively. Its call is to transcend this polarity. It is not about positive versus negative human experience, but the choice to inquire into what is.life-giving. The task of AIM is the penetrating search for what fuels developmental potential, and what has deep meaning-even during the tragedy (Cooperrider & Fry, 2020, p. 269).

AIM offers a broader perspective on how people who investigate the possibilities and varieties of human organization incorporate the centrality of the people who co-construct the conversation, in addition to how they do it and the realities that are generated from it, both individually and collectively (Fitzgerald, Oliver & Hoxsey, 2010).

Returning to the authors Cooperrider and Srivastva (2017), they mention the following elements to carry out Appreciative Inquiry:

- Investigation begins with appreciation.
- The query is applicable.
- The investigation is provocative.
- The consultation is collaborative.

The first element explicitly contrasts Appreciative Inquiry with problem-solving, which they describe as an approach to change based on what is missing. Instead of focusing on the problems to be solved, Appreciative Inquiry focuses on the best examples of the system, its highest values, and aspirations, its most noble actions, etc. (Cooperrider and Srivastva, 2017).

The second element means that the results of an Appreciative Inquiry must apply to the system in which the investigation is carried out and be validated in action.

The third element means that research must create knowledge, models, and images that are attractive to members of the system and provoke people's actions. The final element refers to the fact that the system members must be part of the design and execution of the query.

The Appreciative Interview

The first step in the Appreciative Interview is selecting the topics on which the search for information will focus. Either you are using mini-interviews between participants, identifying themes derived from these, exchanging stories, ideas, and a general description of the criteria for selecting themes (Whitney & Trosten-Bloom, 2003).

Interviews guided by this method bring out the best in people and organizations by providing opportunities for people to speak and be heard. They stimulate curiosity and the spirit of learning, and in doing so, they enhance the organization's knowledge and wisdom. They improve the positive core of the organization by revealing stories that illuminate distinctive strengths and potentials. And they bring positive options for the future (Whitney & Trosten-Bloom, 2010).

As a follow-up to these activities, the mini interviews set the tone for the interview throughout the Appreciative Inquiry. Whitney and Trosten-Bloom (2010) describe interviews as an essential factor for Appreciative Inquiry's success within an organizational setting.

Cooperrider, Whitney, & Stavros (2008) mention that AIM is a collaborative search for the best in people, their organizations, and the world around them. It involves discovering what gives life to a living system when it is most effective, alive, and constructively capable in economic, ecological, and human terms. This method involves the art and practice of asking unconditionally positive questions that strengthen a system's capacity to apprehend, anticipate, and increase its potential.

Below are the main points on which an appreciative interview is based in what is proposed by AIM-2Flourish (2021):

1. Please Share a Story about Your Life… a "High Point" Experience

"Tell me about a time that stood out as a 'high point experience' or 'peak moment' - one in which you felt effective, alive, involved, engaged, or passionate."

2. **Please tell me about your Business Innovation**

WHAT is the innovation? Is it a new product, business model, service, or technology? HOW did this innovation emerge? WHAT motivation or purpose was present to make the innovation? WHO or what was involved in creating the innovation? What did they do? Is the innovation RELATED to a sense of mission, purpose, or meaning? If so, HOW does it do it? WHAT impact does the innovation have on the business, society, or the environment?

3. **Tell me about your Ideas for a Better World:**

Let's assume that tonight, after this class or session, you go into a deep sleep, and when you wake up, it is the future, and ten years have passed - now it is 2031. While you were sleeping, many small and significant developments happened. Please describe highlights or images of what you see in your vision for a better world. Detail what is happening in the year 2031, what is new, has changed, or is better? How do you know? What evidence do you see for this? How does the innovation you worked on ten years ago contribute to these successes?

Based on the previous example, it is possible to detect that Appreciative Inquiry is a method not so explored in certain areas. However, it has been shown that it can promote a positive change in companies.

What is Sustainable Development?

We currently live in a globalized world that requires new responses to the significant or pending needs in the world. That is why it is necessary to consider sustainable development as a competence to be developed, which implies generating an integral vision and projection of objectives, goals, and strategic programs (Márquez, 2014).

On September 25, 2015 in the United Nations General Assembly, the Agenda 2030 for Sustainable Development was approved. It consists of an action plan for the planet, the population, and the prosperity of both. The main goal is eradicating extreme poverty in all its forms and dimensions and ensuring the future of the planet. This agenda seeks that all countries and stakeholders act in a cooperative way through 17 Sustainable Development Goals (SDGs) that contain 169 targets.

The SDGs are a continuation of the Millennium Development Goals but their quest is to deeply connect their social, economic, and environmental aspects-(Stafford-Smith et al., 2017).

The UN (2015) indicates that "the Goals and targets are universal, integrated and indivisible and combine the three dimensions of sustainable development: economic, social and environmental". These three principles are also pursued by the international organization B Corp, which consists of a certification in which companies must be socially responsible and create a social and environmental impact.

An example of organizations with this vision is the international organization AIM2Flourish. It seeks to incorporate students, teachers, and entrepreneurs aligned with this vision of sustainable development. Through appreciative inquiry, it is possible to find companies that respond to one or more of the 17 SDGs, generating a socio-environmental impact by changing the traditional paradigms that measure a company's value with the economic gains they produce towards a vision of carrying out innovative actions for a common benefit within society.

Companies that have become convinced of the impact sustainable development has have begun to articulate actions aimed at promoting the common good and in turn, have inspired other companies to replicate this scalable and replicable model. Higher education institutions build a direct relationship between entrepreneurs, teachers, and students committed to a common good. The latter inspired by great entrepreneurs' life stories, enhance their innovative and entrepreneurial spirit to generate future companies aligned with this production model (Kurezyn & Chávez, 2020).

Sustainable Development Goals

As mentioned above, the SDGs are part of the 2030 Agenda initiatives to address the 17 significant pending issues in the world, providing follow-up for their fulfillment.

In Figure 1, it is possible to see which are the 17 SGDs that are part of the 2030 Agenda:

Figure 1. The sustainable development goals (SDGs)

Based on the UN platform (2021), each of the SDGs are broken down in turn into indicators or dimensions, which are described below:

Goal 1: End Poverty in all its Forms Everywhere.

1.1: By 2030, eradicate extreme poverty for all people worldwide.
1.2: By 2030, reduce by at least half the proportion of men, women, and children of all ages living in poverty in all its dimensions according to national definitions.
1.3: Implement at the national level appropriate social protection systems and measures for all, including minimum levels.

Goal 2: End Hunger, Achieve Food Security and Improved Nutrition, and Promote Sustainable Agriculture

2.1: By 2030, end hunger and ensure access for all people, in particular the poor and people in vulnerable situations, including children under one year of age, to healthy, nutritious, and sufficient food.
2.2: By 2030, end all forms of malnutrition, including by achieving, by 2025, the internationally agreed targets on stunting and wasting of children under five years of age, and address nutritional needs of adolescent girls, pregnant and lactating women, and the elderly.
2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, ranchers, and fishermen, including through safe

and equitable access to land, other production resources, and inputs, and to knowledge, financial services, markets, and opportunities to add value and obtain non-farm jobs.

Goal 3: Ensure Healthy Lives and Promote Well-Being for All Ages

3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.
3.2: By 2030, end the preventable deaths of newborns and children under five years of age, with all countries trying to reduce neonatal mortality to at least 12 per 1,000 live births and the mortality of children under the age of 5. 5 years to at least 25 per 1,000 live births.
3.3: By 2030, end the preventable deaths of newborns and children under five years of age, with all countries trying to reduce neonatal mortality to at least 12 per 1,000 live births and the mortality of children under the age of 5. 5 years to at least 25 per 1,000 live births.

Goal 4: Ensure Inclusive, Equitable, and Quality Education and Promote Learning Opportunities for All

4.1: By 2030, ensure that all girls and boys complete primary and secondary education, which must be accessible, equitable, and of quality and produce relevant and effective learning outcomes.
4.2: By 2030, ensure that all girls and boys have access to quality early childhood development and care services and early childhood education so that they are ready for primary education.
4.3: By 2030, ensure equal access for all men and women to quality technical, vocational, and higher education, including university education.

Goal 5: Achieve Gender Equality and Empower All Women and Girls

5.1: End all forms of discrimination against all women and girls around the world.
5.2: Eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation.
5.3: Eliminate all harmful practices, such as child, early and forced marriage, and female genital mutilation.

Goal 6: Ensure the Availability of Water and its Sustainable Management and Sanitation for All

6.1: By 2030, achieve universal and equitable access to safe drinking water at an affordable price for all.
6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene services for all and end open defecation, paying particular attention to the needs of women and girls and people in vulnerable situations.
6.3: By 2030, improve water quality by reducing pollution, eliminating dumping, and minimizing the emission of chemicals and hazardous materials, halving the percentage of untreated wastewater, and significantly increasing recycling and safe reuse worldwide.

Goal 7: Ensure Access to Affordable, Safe, Sustainable, and Modern Energy for All

7.1: By 2030, ensure universal access to affordable, reliable, and modern energy services.
7.2: By 2030, significantly increase the share of renewable energy in the energy mix.
7.3: By 2030, double the global rate of improvement in energy efficiency.

Goal 8: Promote Sustained, Inclusive, and Sustainable Economic Growth, Full and Productive Employment, and Decent Work for All

8.1: Maintain per capita economic growth following national circumstances and gross domestic product growth of at least 7% per year in the least developed countries.
8.2: Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation, including by focusing on high value-added and labor-intensive sectors.
8.3: Promote development-oriented policies that support productive activities, the creation of decent jobs, entrepreneurship, creativity, and innovation, and encourage the formalization and growth of micro, small and medium-sized enterprises, including through access to financial services.

Goal 9: Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization, and Foster Innovation

9.1: Develop reliable, sustainable, resilient, and quality infrastructure, including regional and cross-border infrastructure, to support economic development and human well-being, with a particular emphasis on affordable and equitable access for all.
9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly increase the contribution of industry to employment and gross domestic product, following national circumstances, and double that contribution in the least developed countries.
9.3: Increase access of small industries and other businesses, particularly in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.

Goal 10: Reduce Inequality within and between Countries

10.1: By 2030, progressively achieve and maintain income growth for the most deficient 40% of the population at a rate higher than the national average.
10.2: By 2030, empower and promote the social, economic, and political inclusion of all people, regardless of their age, sex, disability, race, ethnicity, origin, religion or financial situation or other condition.
10.3: Guarantee equal opportunities and reduce inequality of results, including eliminating discriminatory laws, policies, and practices and promoting appropriate legislation, policies and measures in this regard.

Goal 11: Make Cities and Human Settlements Inclusive, Safe, Resilient, and Sustainable

11.1: By 2030, ensure access for all to adequate, safe, and affordable housing and essential services and upgrade slums.
11.2: By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all and improve road safety, in particular by expanding public transport, paying specific attention to the needs of people in vulnerable situations, women, children, people with disabilities, and the elderly.
11.3: By 2030, increase inclusive and sustainable urbanization and capacity for participatory, integrated, and sustainable planning and management of human settlements in all countries.

Goal 12: Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable

12.1: Apply the 10-Year Framework of Programs on Sustainable Consumption and Production Modalities, with the participation of all countries and under the leadership of developed countries, considering the degree of development and capacities of developing countries.
12.2: By 2030, achieve the sustainable management and efficient use of natural resources.
12.3: By 2030, halve global per capita food waste at the retail and consumer level and reduce food losses in production and supply chains, including post-harvest losses.

Goal 13: Take Urgent Action to Combat Climate Change and its Effects

13.1: Strengthen resilience and adaptive capacity to climate-related risks and natural disasters in all countries.
13.2: Incorporate climate change measures into national policies, strategies, and plans.
13.3: Improve education, awareness, and human and institutional capacity regarding climate change mitigation, adaptation, reduction of its effects, and early warning.

Goal 14: Conserve and Sustainably Use the Oceans, Seas, and Marine Resources for Sustainable Development

14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, particularly from activities on land, including marine debris and nutrient pollution.
14.2: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action to restore them to restore the health and productivity of the oceans.
14.3: Minimize and address the effects of ocean acidification, including through increased scientific cooperation at all levels.

Goal 15: Promote the Sustainable Use of Terrestrial Ecosystems, Combat Desertification, Halt and Reverse Land Degradation and Halt the Loss of Biological Diversity

15.1: By 2020, ensure the conservation, restoration, and sustainable use of terrestrial ecosystems and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and arid areas, in line with the obligations under international agreements.
15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and significantly increase afforestation and reforestation globally.
15.3: By 2030, combat desertification, rehabilitate degraded lands and soils, including lands affected by desertification, drought, and floods, and strive for a land degradation neutral world.

Goal 16: Promote Peaceful and Inclusive Societies for Sustainable Development, Facilitate Access to Justice for All, and Create Compelling, Accountable, and Inclusive Institutions at All Levels

16.1: Significantly reduce all forms of violence and related death rates worldwide.
16.2: End abuse, exploitation, trafficking, and all forms of violence and torture against children.
16.3: Promote the rule of law at the national and international levels and guarantee equal access to justice for all.

Goal 17: Strengthen the Means of Implementation and Revitalize the Global Partnership for Sustainable Development

17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to enhance national capacity to collect tax and other revenues.
17.2: Ensure that developed countries fully meet their official development assistance commitments, including the promise of many developed countries to meet the target of 0.7% of gross national income for official development assistance from developing countries and between 0.15% and 0.20% of gross national income for official development assistance to least developed countries; Providers of official development assistance are encouraged to consider setting a target to allocate at least 0.20% of gross national income to official development assistance for the least developed countries.
17.3: Mobilize additional financial resources from multiple sources for developing countries.

Initiatives that Promote Sustainable Development

Some international initiatives use this methodology, such as AIM2Flourish, associated with other entities like B Corp committed to social entrepreneurship and corporate social responsibility.

The impact of this type of methodologies and initiatives is essential to address CSR. Lee, Kim, YM & Kim affirm in 2018 that corporations must have an ethical responsibility to treat the public and the environment with dignity and respect. Furthermore, for adopting environmental responsibility and green practices, organizational support is essential because the resources required for adopting green practices will be more readily available; thus, the employees will be motivated to implement green behaviors (p .399).

Hodinková (2016) proposes the CSR concept that represents the optimal way for the companies 'management. It is about setting up a relationship with their partners, which would lead to the improvement of companies' reputation and credibility (p. 346).

AIM2Flourish

AIM2Flourish is an initiative of the Fowler Center for Business as an Agent of World Benefit (BAWB) at Weatherhead School of Management at Case Western Reserve University. It has evolved into a movement engaged in discovering entrepreneurs and leaders of businesses that demonstrate how businesses are agents of world benefit, doing well by doing good (Godwin, Stavrobs & Sommer, 2019, p. 1).

AIM2Flourish is an UN-supported platform that recognizes untold stories about profit-making innovations for businesses. A global community of students, teachers, and business leaders. A global resource for sharing stories about business innovations. A catalyst for positive changes in companies. Finally, it is a celebration - the annual Flourish Prizes which have been awarded to the best of the best stories representing each of the 17 Global Goals in 2017, 2018, 2019, and 2020 (AIM2Flourish, 2021).

AIM2Flourish uses Appreciative Inquiry's core idea that lifting positive examples and sharing stories about "what's working" is the best way to motivate, inspire, and educate tomorrow's leaders while celebrating the leaders of today (AIM2Flourish, 2021).

AIM2Flourish means "Appreciative Inquiry Methodology to Flourish". It is a platform where stories of value and companies that are good for the planet are shared. Based on the core idea of appreciative research, it is necessary to show positive examples and share stories about "what is working" in the company. It is the best way to motivate, inspire, and educate tomorrow's leaders while we are celebrating today's leaders. It involves discovering what gives life to a living system when it is most effective, and constructively capable in economic, ecological, and human terms. This method involves the art and practice of asking unconditionally positive questions that strengthen a system's capacity to apprehend, anticipate and increase its potential.

AIM2Flourish aims to connect students with business leaders to celebrate innovations aligned with the 17 UN Sustainable Development Goals (SDGs). It is sponsored by the United Nations Global Compact Principles for Management Responsible (PRIME) and a network of more than 600 leading business schools and management teaching institutions in 90+ countries worldwide. It is also sponsored by the Global Responsible Leadership Initiative (GRLI) and AACSB International, an organization that accredits more than 1,450 management schools. Based on Hunt (2017), AIM2Flourish is inspiring the next generation of business leaders, educators, and consumers to embrace business as agents of global. benefit.

This initiative uses the AIM2Flourish methodology in which students who are part of Business Schools worldwide interview business leaders and entrepreneurs and publish their business innovation story that is potentially scalable and replicable. To achieve an in-depth interview, AIM2Flourish provides an approach that focuses on what works and why it works well.

Interviews guided by this method bring out the best in people and organizations as they provide opportunities for interviewees to speak and be heard. They stimulate curiosity and the spirit of learning, and in doing so, enhance the organization's knowledge and wisdom.

Figure 2 shows the AIM2Flourish Logo.

Figure 2. AIM2Flourish. Based on the proposal of AIM2Flourish (2021)

Once the interview is carried out the students write the story-explaining how the inspiration to implement an innovation arose, what the innovation consists of, and the impact on the business, society, and the environment.

To publish on the AIM2Flourish platform, the following criteria must be followed:

- Innovation generates income or benefits for the business.
- Innovation is built into the company as part of normal operations and activities; it is not philanthropy.
- The innovation is scalable or replicable.
- Innovation contributes to one or more of the 17 Sustainability Goals.

(AIM2Flourish, 2021).

B Corp

Based on Dean and McMullen (2007), sustainable entrepreneurship opens the doors to various opportunities when evaluating the processes and failures within the market that hinder societies' benefit and the economic aspects of the current environment. Therefore, we must overcome these barriers with the development of ideas that help make markets more efficient.

Sustainable entrepreneurship seeks to satisfy people's needs, what the communities require for their proper development is produced. Therefore, it is necessary to work with the correct administration steps of planning, organization, direction, and control to carry out the project without putting the future at risk.

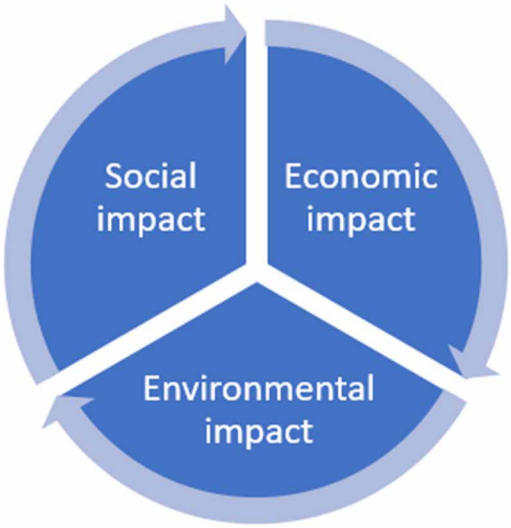
Under this approach, the B Corp movement arises to strengthen social innovation from business organizations, with the idea that part of the benefits they obtain from their environment return to society. Here it also begins to be seen that social innovations can be economically profitable for businesses and not be limited to simple economic donations since the latter are not mechanisms for developing social innovation (Hernández-Ascanio et al., 2016).

In 2006, Jay Coen Gilbert, Bart Houlahan, and Andrew Kassoy decided to sell their successful basketball supply company because they wanted to do something positive for the world through business. Thus, they founded B Lab, an innovative non-profit organization that promotes and enables enterprises to measure the impact they have on their stakeholders: people, community, and environment, as well as

its partners and shareholders. B Lab then launched the B Corporation movement, a global community that has grown to 2,147 for-profit businesses from 150 countries and 130 industries (Correa, 2019).

Figure 3 shows the triple impact that B Corp has, as it seeks to have a social, environmental, and economic impact:

Figure 3. Triple impact of B Corp. Own elaboration, based on the proposal of B Corp (2021)



B Corps follow the highest standards to verify their social and environmental performance, public transparency, and legal responsibility. They are aware of their commitment to the different parties involved, including employees, customers, communities, and the planet, aspiring to be the best for the world.

SOAR

Derived from the use of Appreciative Inquiry there is a method called SOAR (based on the dimensions: Strengths, Opportunities, Aspirations, and Results) that, unlike SWOT (based on the dimensions: Strengths, Opportunities, Weaknesses, and Threats), integrates a strategic planning framework. The purpose is to create a transformation process that inspires organizations and organizational stakeholders to engage in results-oriented strategic planning efforts.

In this way, the AIM2Flourish, SOAR and B Corp approaches focus on what is working well, analyzing why it is working well and how to do more of it.

According to Stavros and Hinrichs (2009), the SOAR Analysis arose from the basic principles of Appreciative Inquiry. SOAR is a strengths-based framework with a participatory approach to strategic analysis, strategy development, and organizational change (Stavros & Saint, 2010).

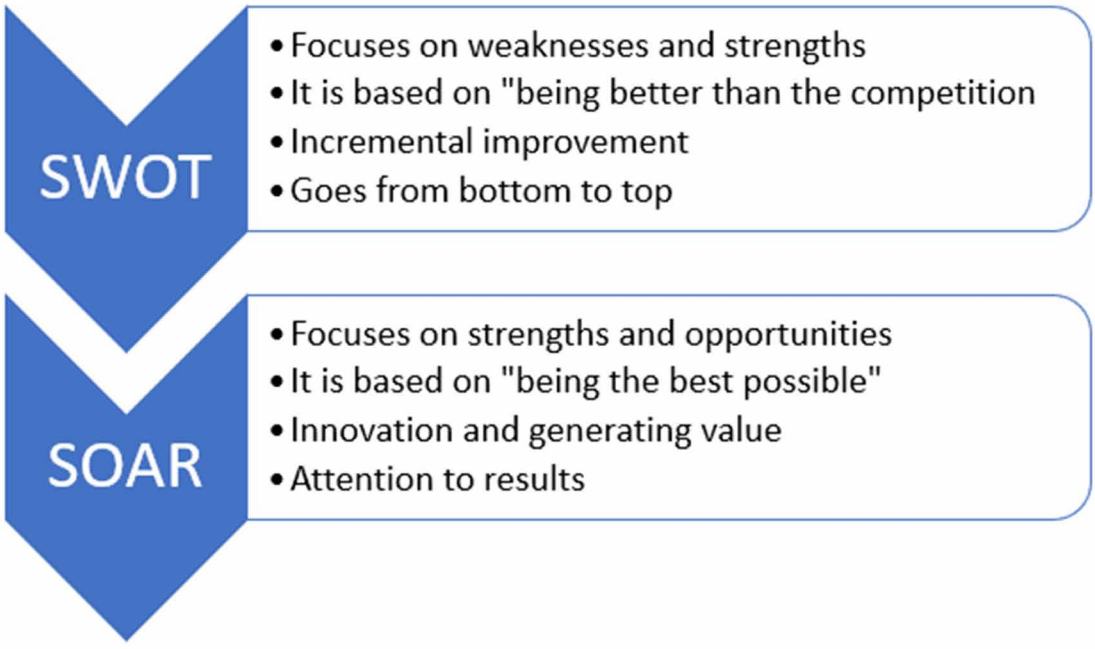
In 2003 Stavros, Cooperrider, and Kelley described the SOAR analysis as an alternative dialogue-based approach to strategic thinking that emphasizes Strengths, Opportunities, Aspirations, and Results.

SOAR integrates Appreciative Inquiry with a strategic planning framework to create a transformation process that inspires the organization's organizations and stakeholders to participate in strategic planning efforts oriented to results. SOAR develops self-reflection, understanding, and considering the activities carried out in the company. SOAR came from an interesting question: If companies are using the traditional strategic planning approach and are having limited success, could we build on SWOT or create an alternative approach?

SWOT analysis has been the standard factor for completing a strategic assessment since the mid-1960s, when it was developed from research conducted at the Stanford Research Institute. SWOT is an analysis tool to evaluate an organization and its internal and external environment. Using SWOT, an organization attempts to understand the static "as is" state of the organization by segmenting strengths and weaknesses and thinking about the possible future state of the organization in terms of Opportunities and Threats. (Stavros & Hinrichs, 2009)

Figure 4 shows the main differences between SWOT and SOAR to have a better understanding of the scope of each of these tools:

Figure 4. Differences between SWOT and SOAR. Own elaboration, based on the proposal of Stavros & Cole, (2014). SOARing towards positive transformation and change



According to the SOAR framework, "S" for Strengths provides the foundation for discovering and aligning an organization's best capabilities for a process of focus on more decisive advantage and a more sustainable future.

The "O" for Opportunities moves into the realm of positively locating and enhancing potentially unexplored efforts and innovations.

The "A" for Aspirations expands and gives voice to the horizons of those who are focused on the future of the organization.

Finally, the "R" in Results reinforces and activates the motivation, resources, and commitment of those involved to achieve the desired results (Stavros & Cole, 2014).

The SOAR analysis, according to Srivastva and Cooperrider (2017), helps the strategic evaluation process, begins with an investigation to discover how the organization has been successful in the past and how the organization is succeeding in the present. The strategic process helps build a sustainable competitive advantage for the future by identifying the organization's unique value offering.

Such a phenomenon occurs through an ongoing conversation with the identified stakeholders of the company. Through this dialogue, appreciative ways of knowing the history and basic capabilities of an organization are enriched.

Cooperrider, Whitney, & Stavros (2008) summarize it in these five phases:

- **Initiate:** Organizational leadership engages in conversation and strategic formulation in applying SOAR and integrating it with existing strategic planning methods, processes, and applications. They also identify relevant stakeholders and ways to include those stakeholders in the process. The core strategic planning team is created, and a conversation about the strategy's language can take place to ensure that there is shared meaning and understanding of the strategy and the type of strategic plan that will be created.
- **Research:** This is strategic research on the organization's values, mission, internal strengths, and external environment to create opportunities and conversations about aspirations and results. Both the organization's current state and future possibilities of the organization are explored.
- **Imagine:** A creative dialogue considers the influence of strengths, opportunities, and aspirations to create a shared vision for the organization. Participants involved in the organization use the power of positive images of the future as a basis for positive actions and results; it is these images and the supporting dialogue that create the inspiration and enthusiasm to fuel strategic plans.
- **Innovate:** the strategy is designed to create the "how and what" of the best way forward. Strategic initiatives identify and prioritize changes to existing processes, systems, structures, and culture, as discussed in the Imagine phase. These changes leverage strengths, opportunities, and aspirations to achieve results.
- **Implement:** energy, commitment, and tactics plans emerge from implementing the strategy that achieves the desired results. The results are used as feedback measures for course iterations and corrections. The implementation involves many people with different skills and competencies aligned and working on linked projects.

SOAR Analysis, which, in theory, begins with strategic research using appreciative intent, presents a disciplined approach to help an organization identify its strengths with an eye on what works best to

implement potential growth opportunities. SOAR is best recognized as a strengths-based framework with a complete systems approach for strategic thinking and planning (Stavros, Cooperrider & Kelley, 2003).

Leadership With Social Impact

Through the, AIM2Flourish initiative, stories of social innovation aligned to one or more of the SDGs have been published. These stories are available on aim2flourish.com to inspire more people (students, teachers, and entrepreneurs). These stories are an example of leadership with social impact that has been generated in various actors. Below is the description of some of these stories to better understand the approach and use of AI in sustainable development:

1. **CINIA- A Company Where Disability is a Labor Competence (Flourish Prize Honoree, Global Goal #8, 2017):** CINIA is a social enterprise dedicated to provided work for people with disabilities who are 18 years old or more and self-sufficient in their mobility. CINIA helps them obtain an income that allows them to be independent or to help their families. CINIA has the firm conviction that as Mr. Fernando Diez (CEO of CINIA) said: "Work is the only way to transform the lives of people and for them to transform their own lives" (Kurezyn, Carillo González, Ariza & Dionne, 2016).
2. **Life-Giving Metal Sheets (Flourish Prize Honoree, Global Goal #9, 2018):** Estructuras Metálicas Solana is a Mexican company dedicated to the manufacture of sheet ceilings for various companies and industrial factories. One of its main products is the creation of green roofs, made with ecological sheets, which reduce pollution and create environmental awareness (Aguilera, Vargas, Alvarado & Kurezyn, 2017).
3. **Colorful and Inclusive Oil:** Petróleos Mexicanos (PEMEX), one of the largest companies in Mexico, is a great example of inclusion and diversity. PEMEX has a specific area and different programs that deal with issues related to gender equality, equity, and work well-being, which has brought great benefits to its employees (Aguilera, Vargas, Alvarado & Kurezyn, 2017).
4. **A Better Way to Cook (Flourish Prize Finalist, 2018):** Glatt Stove is a Mexican B Corp committed to the environment and health of Mexicans. La Estufita (little stove) can be used anywhere and uses liquid natural gas which makes it possible to cook in a different way and in any place, eliminating the risk of smoke inhalation from cooking with wood which is extremely harmful to health (Domínguez, Cortés, González & Kurezyn, 2017).
5. **Bugs and Proteins:** Gricha is an environmentally responsible Mexican company that seeks to take advantage of all the nutritional benefits of grasshoppers, presenting them as visually pleasing foSDGs, such as cookies, and in this way combat two of the great problems that occur in Mexico: obesity and malnutrition. This product can help many people, in addition to contributing to the environment looking for options that do not represent a problem in the future such as cattle (Amaya, Soberón & Kurezyn, 2017).
6. **The Globetrotter Uniting Customs and Fashion:** By making shoes, Guie creates ethical and equitable jobs for indigenous communities, whilst also sharing their rich culture to Mexico and worldwide, helping to contribute to these communities' well-being in their quality of life and professional dignity (Szymanski, Castañeda, Sánchez, Ávila y Kurezyn, 2018).

7. **Good morning, life ... what do you have for me today?:** Education is being transformed and this proposal, in particular, offers a new field to educate through art, mainly theater. For Sergio Alvarez, author of the works and entrepreneur of educational theater, this project was very clear for him a long time ago (Velázquez & Kurezyn, 2018).
8. **The Ecological Diapers:** Cloth diapers have been around for centuries, but Ecopipo has made them more effective and easier to use for a modern world. From day one, when Ixchel bought the fabric to make the company's first diapers, Ecopipo has been an ecologically focused company. Since then, the company has grown and created a sustainable and pleasant work environment for those inside and outside the company. The business has grown steadily as more and more people choose ecological fabric products that help the planet (Díaz & Kurezyn, 2018).
9. **Responsible Homes (Flourish Prize Honoree, Global Goal #15, 2019):** There are many opportunities to start making changes around the world. What often happens is that we pay no attention to the right time to act and become leaders of change. Ecodom considers conditions necessary for people to access quality jobs thereby stimulating the circular economy to optimize their income and generating a decent work environment by reducing hours of manual labor, increasing productivity, and reducing unemployment (Vázquez & Kurezyn, 2018).
10. **Art Inside and Beyond Bars:** Insecurity is one of the main problems in Mexico. It grows when ex-offenders after serving their sentence do not have opportunities to rejoin society and the world of work. Prison Art gives solution to this situation through a program of rehabilitation, training and a decent job offer (Ortíz, Rodríguez, Torres, Martínez & Kurezyn, 2018).
11. **Housing that Involves and Changes Lives:** MIA's business model is looking to break the paradigm of the rural community: Fear of the long term. Building a house in stages, from the top to the bottom, represented a change in the way that the progressive housing is seen, and it is a way to generate innovation in a traditional sector by facilitating access to dignified houses for the rural community in a housing lag. This contributes to the reduction of poverty, decreases inequality, and improves the quality of life for the people (Ocampo, Paz, Teutle, Valdez & Kurezyn, 2018).
12. **A New Way to Drink Coffee:** Mexico is the fifth most important producer of coffee in the world. Its coffee production involves more than 282,000 producers and according to the Center for Public Finance Studies of Mexico, the vast majority are smallholders and indigenous people. Café Colibrí set as a goal to make a difference by creating a value chain that would provide benefits from the main coffee producers to the baristas that serve in each of the existing branches in Mexico (Guzmán, Guzmán, Calderón, Iglesias, Kurezyn, 2018).
13. **Responsible Lifestyle:** In Mexico, hundreds of indigenous communities live in extreme poverty, and at the same time, design high quality products. But unfortunately, it is very difficult for them to enter the modern market and to get out from the situation themselves found. Someone Somewhere has found the opportunity to make a difference and contribute to a better lifestyle in the communities by giving them training in textile and financial topics, as well as the growth and development of the artisans and their children, thus creating an independent and collaborative environment (Rocchi, López & Kurezyn, 2018).
14. **A Second Chance in Your First Country:** PGBBQ offers the experience of a Texan restaurant with all that this entails, both to its customers and its employees. Therefore, the owners try to give

their employees the benefits and values as if they were working in the United States. The foregoing allows the American work culture to permeate among its workers, which is important because it improves the quality of the service and provides enriching bicultural experience (Johanssi & Kurezyn, 2018).

15. **Eradicate Poverty with Light**: Iluméxico installs solar panels in rural communities in Mexico where there is no access to electricity, helping to improve the quality of life and seeking to end energy poverty. There are two million people without access to electricity in Mexico as of today, an alarming figure, considering that in most of the world a technological revolution is taking place (Szymanski & Kurezyn, 2019).
16. **Microalgae Technology Saving Lives (Flourish Prize Honoree, Global Goal #13, 2020):** Biomitech is a Mexican company that works for the preservation of the planet through the development of technologies that are inspired by nature, this technology is based on a tree that contains five microalgae tanks that perform the function of the photosynthesis to purify the air of cities and provide spaces free of contamination (Vicencio, Ortiz, Teutle & Kurezyn, 2019).
17. **Writing Instruments that Help Save the Planet:** Kuil Ecolápiz creates green handmade products for writing. Its intention is to help improve the environment, replacing the main materials with which these products are created and thus, be an example for other companies, being socially responsible. The intention is to generate an article for daily use, such as writing products, in this case pencils, but with a touch of innovation, a handmade touch and with a differentiation that makes it unique" (Zaragoza & Kurezyn, 2019).
18. **Doing Good Business is Good Business for Everyone:** Through the adoption of triple-impact commitments by its customers, Unboxed seeks to eradicate indifference to global issues. They apply a strategy in which they promote quality education; decent work and economic growth; responsible production and consumption; without neglecting the creation of alliances to achieve the Sustainable Development Goals (García & Kurezyn, 2019).
19. **Take Advantage of Crisis for Social Impact:** Incyma is a consultancy located in Badajoz, Spain with 12 years of experience with a commitment to Corporate Social Responsibility as a competitive strategy for its clients to choose to implement best practices in favor of society and the environment. Incyma contributes to gender equity; quality education; decent work and economic growth; as well as responsible production and resources (García & Kurezyn, 2019).
20. **Let's Dignify Mexican Crafts:** Fusión Verde is an organization that sells 100% Mexican handicrafts that, at the same time, seeks to preserve the biocultural richness of Mexico. The organization creates awareness and contributes to the education of society. Through its products with its clients and by combining the conservation of biodiversity in the country, it seeks to generate decent work and economic growth by dignifying the products created by artisans dedicated to this type of production, struggling to reduce the inequality they frequently face (Lozano & Kurezyn, 2020).
21. **Simulators and Games as Tools for Human and Social Development:** An ideal way to size-up and develop human resources is through supervised simulators. These simulators offer us rigorous observation events of behaviors between the participants. Developing work teams is not an easy task. Inside of extensive spectrum of options, the simulation programs of ¨swarm thinking¨ has given the best results (González & Kurezyn, 2020).

22. **Weaving Traditions to Create Sustainable Communities (Flourish Prize Finalist, 2021):** Cielo Hamacas is a socially responsible organization committed to the sustainable development of indigenous communities in Mexico through the manufacture and distribution of the highest quality hammocks. It is an integrated company that promotes the empowerment of women, especially those from the Mayan indigenous community, who represent 90% of the organization's warpers. It seeks to empower women as heads of families and as entrepreneurs and an instrument of change in their communities (Lozano & Kurezyn, 2020).
23. **The Sustainability of a Company Is the Door to Happy Employees:** Axius provides consulting services to people and companies to generate sustainable growth. Its main purpose is to build a more integrated and conscious world, as well as to empower companies through the alliance with their strategic partners and by enhancing innovation (Lozano & Kurezyn, 2020).
24. **Cricket Lifestyle:** BeCrickets is a food business dedicated to inspiring a healthy and sustainable lifestyle. It was created to positively impact people in terms of their health and the environment. BeCrickets emerged with the idea of finding an efficient and safe way to produce and improve the quality of insect nutrient products (Borunda & Kurezyn, 2020).
25. **Hipocampus-Learning Centre:** Hipocampus is a social company, which principal aim is to provide very high-quality education to early childhood at an affordable price for most families in Mexico. To achieve this and support mothers and fathers' workers, Hipocampus partners with large employers to provide a service fully aligned with their needs and those of their employees (Andrade & Kurezyn, 2021).

SOLUTIONS AND RECOMMENDATIONS

Cooperrider & Srivastva (2017) allude that the Appreciative Inquiry Methodology results in new knowledge, which can be verified in this research. This methodology gives rise to the creation of the SOAR Analysis. The authors, Stavros, Cooperrider & Kelley (2003), describe the process to satisfactorily perform the analysis of the information collected through AIM.

Also, the importance of the UN Sustainable Development Goals' objectives was recognized since they are an action plan for the planet, the population and whose main aim is to eradicate extreme poverty and ensure a future for the environment to be able to make a better world. The 17 SDGs seek to respect human rights, gender equality and align with the three dimensions of sustainable development: economic, social, and environmental (United Nations, 2015). The SDGs help companies because they can positively guide efforts to impact the environment positively.

FUTURE RESEARCH DIRECTIONS

Unlike many approaches to change, AIM does not focus on changing people. Instead, it invites people to get involved in building the kinds of organizations and communities in which they want to work and live. Therefore, AIM involves the collaborative discovery of what makes an organization more effective in economic, ecological, and human terms. From there, people weave that new knowledge into the fabric

of the company's formal and informal systems, such as how they develop and implement the company's strategy or organize themselves to perform tasks. This process represents authentic learning and change (Watkins, Mohr & Kelly, 2011). Thus, AIM is a starting point to analyze what the organization's foundations are and, from there, define where it wants to be in the future.

Thus, the sustainable development approach must be directed towards strengthening ecological and social actions to impact the quality of life of future generations, considering various capacities and freedoms that promote a dignified life in all its dimensions (Marquez, 2014).

CONCLUSION

It is essential to understand that social innovation arises to meet society's needs or demands through different actors such as social entrepreneurs, organized civil society, and public administration (Hernández-Ascanio, 2016).

Thus, sustainability, which ensures that human beings satisfy their needs without compromising those of future generations, seeks a balance between human activity and environmental care. These practices seek, in the end, that human beings have a better life and alleviate poverty through the transformation of the economic, social, and environmental model.

Thus, social entrepreneurship is related to entrepreneurial projects based on social, economic, and environmentally sustainable business principles. Furthermore, social entrepreneurs are committed to resolving different socio-economic problems through projects based on social innovations (Rakitovac & Urošević (2017, p. 65). Therefore, it is a priority to carry out new practices that promote more sustainable practices that benefit society in various dimensions, creating healthy and flourishing organizations.

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KEY TERMS AND DEFINITIONS

AIM2Flourish: It is an international initiative and Platform that incorporates the SDGs through which stories about innovations aligned to these are published.

B Corp: Certification focused on businesses worldwide with a triple impact: economic, social, and environmental.

Corporate Social Responsibility: Responsibility that companies have for the environment and society.

Organizational Development: Processes that seek to develop human capital, achieving efficiency and success in business.

SDGs: Initiative promoted by the United Nations that consists of achieving 17 goals by the year 2030.

SOAR: Methodology focused on measuring the dimensions: Strengths, Opportunities, Aspirations, and Results in an organization, with an appreciative approach.

Social Innovation: Innovative solutions to social and environmental problems, focused on the well-being of the person.

United Nations (UN): It is an international organization that seeks to maintain international peace and security.

Chapter 7
The Impact of the Work Environment on Innovation and Business Sustainability in SMEs: The Case of San José de Cúcuta, Colombia

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ABSTRACT

Innovation is a process, where the interpersonal relationships of employees are key to the creation of ideas that will contribute to the generation of value for organizations in the face of disruptive environments. This chapter analyzes the relationship between the work environment as a key factor and its impact on the development of innovation processes and business sustainability, taking as a sample 182 SMEs, from commercial, footwear, and textile sectors from the city of Cúcuta. The results showed an interrelation between the organizational climate and the culture of innovation as an agent that generates change that contributes to business sustainability.

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INTRODUCTION

Global and disruptive environments have influenced the development of tools that allow quick answers to market fluctuations. Hernández-Fuentes & Sánchez-Mojica (2017) state that the world is in constant evolution, and that globalization and disruption are factors that influence decision-making of countries and enterprises. Then, product innovation becomes an essential factor for the development of organizational activities. It is important to highlight that innovation is an attitude of all employees, environment or culture that result in innovative practices that spread throughout the organization (Perez-Uribe, 2007; Bahcall, 2019). Therefore, innovation starts with the generation of ideas of people who want to provide solutions to daily problems.

Innovation is an opportunity for growth, an answer to the economic dynamics of the organizational context. In this process, technology becomes an important factor that can be used in a variety of combinations, starting from the existing relation among technology-product-market (López González & Robledo Velásquez, 2014; Chen, Yin and Mei, 2018); thus, to have successful innovation processes, it is necessary that capabilities of people who participate in the process of creation of ideas (…) consider the attitudes of individuals towards (…) learning processes (…) [that] along with the understanding of the environment transform knowledge into new products (Morales, Ortíz Riaga, & Arias Cante, 2012; Cunha and Benneworth, 2020).

However, that is not enough since innovation starts from the generation of creative ideas, being necessary to analyze why the number of innovations created in enterprises is not enough. It is then when organizational environment and the attitude of workers towards the Enterprise may become a key factor to develop soft skills, in order to generate processes of organizational innovation that contribute to business sustainability in disruptive environments.

According to the Organization for Economic Co-operation and Development OECD (2005) innovation is to be considered one of the strategic factors of the enterprise or one of the elements of a series of investment decisions aimed at creating products development capabilities. Therefore, innovation became a concept that enterprises use to change their products as an answer to their interaction with the environment. The concept of innovation is subjective in everyone, being able to accept it or reject it (Alvarado-Ramírez & Pumisacho-Álvaro, 2015; Dziallas and Blind, 2019).

Organizational structure and culture are related to the development of innovation, knowledge and strategy in the enterprise (Pérez-Uribe, 2007). Besides, other authors such as Camio (2014) relate business creativity to innovation. So, in order to boost creativity, it is necessary to have a culture and working environment that facilitates innovation, being it a social phenomenon in which human development flourishes, thus enhancing the ability to transform organizations into intelligent companies in the way they influence their internal and external environments and how they react to changes (Mejia-Giraldo, Mendieta-Cardona, & Bravo-Castillo, 2015). In such sense, an organizational forward-looking culture is necessary to apply innovation, being that an essential element of the intangible capital of organizations (Acosta Guzman, 2015; González and García, 2011).

Regardless the forward, managers and directors nowadays spent most of their time dealing with operational and controlling activities, not formulating strategies, neither evaluating the possibilities of future scenarios (Pérez-Uribe, Garzón-Gaitán, & Nieto-Potes, 2013). Therefore, enterprises must try to

be proactive to develop those sectors in which they work, so they need to continuously reinvent themselves to answer to changes and new requirements from the market (Carro-Suáreza, Sarmiento-Paredes, & Rosano-Ortega, 2018).

A way of reinvention is to increase the adaptability of administrative processes, which allows enterprises to answer quickly to market needs, searching for new methods to facilitate the adaptability to the external environment (Candía, Coliñanco, Caro, & Hernández, 2014). Knowledge management is then a challenge for SMEs in order to build organizational learning as the base of a competitiveness based on innovation, productivity, flexibility, and efficiency for labor and capital (Mejía-Giraldo, *et al.*,(2015).

Enterprises must consider the development of a business culture based on innovation, at long-term, open to new trends, strong enough to keep its core values (Acosta Guzman, 2015).

For all the aforementioned, this study was carried out in companies in the city of Cucuta - Colombia to observe the relationship of the work environment and innovation, the results of which are shown throughout the work and mainly in the findings and conclusions and recommendations.

THEORETICAL FRAMEWORK

Innovation and Working Environment

Robayo (2016) and Herzog and Leker (2010) defines innovation in the organization as a new organizational method on practices, the organization of the workplace or the enterprise's external relations, which makes administrative innovation a main factor for competitiveness; however it is necessary that enterprises apply strategies to promote the performance of their human resources, considering that the working environment has a significant influence on the generation of innovative knowledge. Likewise, improving working environment conditions have a positive effect on innovation, since it spreads to other levels and stakeholders, aimed at having more complex innovations. Thus, in accordance with what is stated by Urgal, Quintás, & Toméa (2011) the role of working environment on the innovation performance is important to develop such types of processes.

According to García-Pintos, García Vázquez & Piñeiro García (2010), an appropriate design of human resources policies can positively affect the worker's knowledge transfer; such process is extremely important for organizations, due to its multiplier effect on innovations.

Organizational Environment or Working Environment

According to Quiñonez-Tapia, Pérez-Avalos, Campos-Sánchez & Cuellar-Hernández (2015), the work environment is the existing concomitance between the knowledge of motivational trends, the person's self-concept, his/her role and his/her personal relations at work. The work environment boosts the creation of administrative innovations through an appropriate knowledge management (Ajala, 2012).

Ordaz, Cruz, & Ginel (2010) and Hassanain, (2010) state that the degree at which knowledge is shared among members of the organization has a positive correlation with the organization's innovative performance and therefore, the work environment becomes an essential factor for business development and strengthening since it contributes to generate knowledge that allows to make changes from inside the organization.

Arias Gallegos & Arias Cáceres (2014) and Bennett & Durkin (2000) infer that work environment and work satisfaction depend on organizationsal features, and both are the cause of multiple ways of organizational behavior. Enterprises must manage their human resources in order to strenght competencies that allow for the development of innovations (Zott & Amit, 2009).

Pérez-Uribe & Ramirez-Garzón (2015) state that since human resources are not being given the importance they deserve, the work environment is not adequate for workers to be and feel productive, innovative and creative.

Organizational Culture

According to Naranjo-Valencia, Jiménez, & Sanz-Valle (2012) and Friedman (2014) organizational culture is one of the main factors that influence innovation, either to stimulate it or inhibit it; the "organizational link" refers to the values shared by the organizations' members, and it is the one that influences innovation the most, both positively and negatively. Thus, when the main values shared by the members are commitment to innovation and continuous change, typical of adhocratic cultures, innovation increases, while it reduces whenever respect for norms and policies and hierarchal behaviors are the norm (Laforet, 2016).

It is advisable for any manager to give the adequate importance to organizational culture and work environment since whenever they improve, they can become the strategy that motivates their workers to be committed to the organization (Naharuddin & Sadegi, 2013), contributing to its performance, innovation, and competitiveness (Pedraza Melo & Bernal González, 2018). Consequently, the workers' sense of belonging to the organization significantly influences the administrative processes of innovation that provide management change, business strengthening and organizational sustainability (Varela & Méndez, 2017; Palvalin, 2017).

Disruptive Environments

A disruptive environment is associated to unexpected behaviors in the economic context of countries, providing that they affect their enterprises' survival; they can be considered as a cause for A disruptive environment associates to unexpected situations in the economies of countries, since they are risky and affect the enterprises' survival, as, for example, the Covid-19 pandemic. It is necessary to consider the industry type, leadership and work environment of each enterprise since such factors shape each organization. Behind every disruptive conduct, there is an important background of information that must be analyzed by each enterprise's top management (Jurado & Justiniano, 2015).

Besides, the quick development of ICTs, and the innovation of digital systems, are creating a revolution, changing the way people think, behave, communicate and work; the Digital Revolution has created new methods to create knowledge, educate people and transmit information and has restructured the way countries trade, manage economies, law and political compromises (IMEF, 2015).

EAE Business School (2020) mentions that to manage disruptive contexts it is necessary an effective leadership that administers the following key factors: a) manage flexible procedures: to motivate towards satisfaction, reducing uneasiness; time is important for new generations, and they can work by objectives in order to have more time; b) facilities: a coffee machine wi-fi, printer and devices necessary for daily operations must be ready for use; this facilitates the job and creates empathy; c) ergonomics:

the workplace must be according to workers' needs, being comfortable and suitable to develop working tasks; d) attitude and teamwork are essential to lead nowadays; new generations pose a challenges, so it is key to understand them and provide what they require to create an environment that encourages productivity and progress.

Business Innovation in Colombia

The Economic Commission of Latin America and the Caribbean ECLAC (2016) states that innovation must not only reduce the existing productivity gap with developed countries and favors equity, but also reduce environmental costs of growth; so, several countries have made commitments to advise enterprises to develop innovations that create sustainable development in different regions, thus creating strategies to create knowledge to improve products and organizational processes. Thus, through innovation, competitive advantages for the productive development of countries have been achieved. Then, the triad industry-academy-government becomes a key player to produce and manage knowledge that contributes to the economic and social structure of a region.

The World Intellectual Property Organization WIPO (2018) measures the innovation index in different countries, which is published in the Global Innovation Index (GII) and provides a detailed vision about innovation. In 2017, Colombia ranked 65, and in 2018 ranked 63 out of 127 countries with a score of 33.78, evidencing that there is an increase as a result of activities developed in the country.

The GII identifies 7 pillars to create an indicator of efficiency of innovation, considering the quality of resources used and the results obtained, for which it establishes two groups of indicators: the resource subindex and the results subindex. After analyzing such pillars, it is concluded that Colombia ranks low (last positions) in development of human resources, and ranks 78 in human capital and research, 77 in creative production, 68 in production of knowledge and technology, proving that Colombia must emphasize on working on its human resources.

SMES in Colombia, Latin America and the Rest of the World

Morales *et al*., (2016) state that R&D activities worldwide have become facilitators for knowledge creation, being Japan, the USA and Europe the main players, where the management of innovation systems enables the strengthening of processes inside organizations, achieving sustainability. Romero Luna (2006) states that SMEs in developed countries contribute to boost productivity as a result of local innovation systems, innovative capabilities and technology assimilation resulting from collective learning processes that through knowledge transfer contributes to business efficiency, which turns into the economic growth of countries. On the other side, SMEs in developing countries the main source of progress is the transfer of knowledge coming from overseas. That is why implementing administrative innovations contributes to strength SMEs and achieve sustainable development, being especially important in this process as a key factor for business sustainability and competitiveness, something that is evident in developed countries.

According to Astudillo & Briozzo (2016) Latin American SMEs grow slower than enterprises in similar economies overseas as a result of failures in innovation management that affects their productivity and competitiveness, showing differences regarding the best practices in such matter.

Ramírez-Garzón & Perez-Uribe (2019) and Avendaño (2012) state that most Colombian SMEs managers are also the owners, who manage their enterprises in the traditional way and empirically; most of them are not adequately trained in administration, have limited abilities of business management, strategic planning, investment and R&D, and show ambiguity when considering the competitive point of view. Therefore, it is essential to implement processes of administrative innovation that boost SMEs sustainability and growth.

SMEs and Business Innovation in the Region of Norte de Santander

According to the Chamber of Commerce of Cucuta (2018) there were 47,026 enterprises on October 28th, 2018, from which 2.63% belonged to the primary, 20.92% to the secondary and 76.45% to the tertiary sector; 46,698 were SMEs, from which 35,701 belonged to the tertiary sector, showing that the main economic activity of the region focuses on trade as source of income for the region.

In the region of Norte de Santander, business innovation has focused on production, under the premise that organizational competitive advantage is achieved through investing on the development of new technologies that enable improvements in the production area of enterprises; therefore, it is necessary to find out which activities are contributing to achieve such capabilities [generation of scientific knowledge linked to R&D] (Santamaría, *et al.,* 2009). Thus, the disruptive organizational environment has forced to make changes to the administrative processes, in businesses, including those of Norte de Santander.

METHODOLOGY

This is a descriptive research, with a transactional correlational-causal design, since it measures a specific sample in a specific moment of time. There are two dimensions in the methodological design of this research: 1) theoretical, evident in the methodological development of the research, revolving around the systematic literature review, design, validity and application of the information collection instrument, which are the axis of the research; and 2) empirical, evident in the preparation and analysis of the information aimed at presenting the research' results.

According to the Chamber of Commerce of Cucuta (2018), in 2017, 343 enterprises (76% of them SMEs) had joined the Pact for Innovation. The population for this research were 261 SMEs (registered at the Chamber of Commerce of Cucuta) belonging to the trade, footwear, and apparel industries.

To determine the sample, the probabilistic formula of simple random sampling for a finite population was used (Perez-Uribe, 2012, p. 49).

$$n = \frac{p(1-P)}{\frac{E^2}{z^2} + \frac{P(1-P)}{N}}$$

Where,

P = Probability of success.

1-P = Probability of failure.

E = Maximum permissible error

Z = Number of necessary units of the normal distribution for a given confidence level

N = Population size

For the research, we worked with a universe of 261 SMEs registered as such in the Cúcuta chamber of commerce for the year 2018; 95% probability of reliability, 0.5 probability of success and a 0.04 margin of error.

Applying the formula:

$$n = \frac{0,5(1-0,5)}{\frac{(0,04)^2}{(1,96)^2} + \frac{0,5(1-0,5)}{261}} = \frac{O_1 25}{0,002} = 182$$

As a result, when applying the sampling procedure, so that the data obtained provided 95% reliability, surveys were carried out on a sample of 182 SMEs, from the sectors: commercial, footwear and textile.

The information was collected through a questionnaire shown in Annex 1.

RESULTS

Innovation

Data shows that enterprises in Norte de Santander associate innovation to technological changes, considering that organizational changes that must be implemented to optimize resources are less important. Also, change management focuses mainly on generation resources for technological investments and/or techniques that optimize production processes, leaving business innovation behind.

The innovation variable is analyzed in Table 1, regarding 1) the knowledge of workers about administrative processes and 2) if they deem both concepts necessary for organizational planning and management, in order to determine how they perceive innovation in their enterprises. Data showed that 142 managers recognize concepts of innovation; however, they identify innovation focusing only on operating activities, with 39% of them associating it to technological advances and 36% to production, while only 6% consider strengthening of administrative processes as a key factor to develop innovations in the enterprises.

Table 1. Questions 65, 66 and 67. Variable: innovation

QUESTIONS	YES	NO	
Do you understand the concept "Innovation"?	142	40	
For you, innovation refers to:			
Technology			174
Administrative Processes			26
Production			161
Market			74
Other			11
The Enterprise designs innovation processes through process planning	44	138	

Source: Own elaboration

Human Capital as Booster of Innovation Processes

Creative and learning processes can benefit from an environment that allows the expression and discussion of emotions (Ashforth & Humphrey, 1995, cited by Camio, 2014). It is important to highlight that the enterprise must reinvent itself continuously in order to optimize administrative processes, in order to answer to the changing requirements of the economic disruptive environment, and not be left behind as a result of resistance to change. Consequently, the enterprise must generate spaces that enable the creation of ideas through organizational environments if it wishes to develop innovation processes.

So, this research evidences a confusion regarding the concept of innovation, which is perceived by workers as technological developments that have an impact on business productivity, but they do not consider the administrative innovation that can have a significant effect on the development of organizational processes. Data shows that workers understand that human resources are those who create innovative ideas, but there are shortcomings when recognizing and answering to personal interests as incentives to design and create ideas to innovate inside the organization.

Moreno *et al*., (2011) state that the contribution to the specificity of human capital is stronger than the value in which this type of skills gains higher importance than knowledge and abilities known by all the members of the organization and the competition. Thus, getting innovative results depends on the availability of a few capabilities linked to R&D (Santamaría, Nieto, & Barge-Gil, 2009).

Table 2 shows that 96% of SMEs conduct assessments to their workers in order to measure their performance in the development of their activities; besides, 92% considers human resources as the key factor that makes the development of innovations possible, and 69% recognizes the personal interest of their workers, while, in comparison, only 8% has stimulated the generation of innovative processes by their workers. This shows that even though enterprises consider innovation essential for business strengthening, a culture of innovation is just emerging, and the generation of new knowledge is not a main factor for the development of activities inside organizations.

Also, 41% considers changing of administrative processes (administrative innovation) as an information source to make decisions that enable organizational strengthening and allows answering to changes in the market; on the other side, 87% recognizes the importance of innovation for business development and sustainability, which shows that even though innovation in every activity is important for SMES, they

Table 2. Questions of the variables of work environment and innovation

QUESTIONS	YES	NO
Do you consider innovation as an important factor for business development and sustainability?	87%	13%
Do you consider human resources important for the development of organizational innovations?	92%	8%
Does the enterprise recognize the personal interest of its workers?	69%	31%
Does the enterprise care for the needs of its workers?	47%	53%
Does the enterprise consider the design of innovative processes such as salary incentives?	8%	92%
Do you think the enterprise considers your opinion when making decisions regarding the change of administrative processes?	41%	59%
Is every worker evaluated with the objective to measure his/her performance in the development of his/her activities?	96%	4%

Source: Own elaboration

have not facilitate spaces to encourage the creation of ideas that can improve administrative processes; this shows that there are shortcomings regarding culture to develop innovative processes.

Undoubtedly, human talent is socially relevant inside enterprises because the own experience and knowledge (individual and collective) and that learnt and incorporated by education and labor practice will contribute to the development of new skills, ideas, and ways to make and use resources that lead to the transformation of administrative processes in enterprises (Álvarez-Aros & Bernal-Torres, 2017); this is why innovation becomes a complex process that involves many important variables of an enterprise, the most important one being human talent; it is very difficult to carry on an innovation process successfully if workers do not feel involved and motivated (Haro Carrillo, Córdova Rosas, & Alvarado Garcés, 2017).

The Work Environment and its Impact on the Development of Business Innovation Processes

Business innovation is not just about technological advances, but also administrative innovations that improve organizational processes and optimize resources used by enterprises, so, it is there where work environment plays an important role. Innovation is a process of creation of ideas, so a positive work environment boosts innovation since it influences the motivation and creativity of workers (Amabile, Conti, Lazenby, & Herron, 1996, cited by Duque Oliva, 2015).

The variable work environment was analyzed through several questions (shown in Table 3) referring to how important enterprises consider it, and its improvement a main factor for the development of organizational activities and processes. Data shows that 79% considers that healthy relations among working teams enables efficiency and cooperation, so training and personal development plans become essential tools to strength soft skills, therefore facilitating management of workers relations, as it is evidenced by the fact that 81% of enterprises have training plans.

Even though enterprises consider soft skills important, 80% of them still do not promote the creation of spaces to help workers to create innovative ideas. This shows gap that exists in Colombia regarding a culture of innovation as a factor to generate change and contributes to business sustainability, confirming the rank obtained by Colombia regarding the development of human capital according to the Global Innovation Index (GII).

Table 3. Questions changed into variables of work environment

VARIABLES	YES	NO
Healthy and cooperative relations among teams which allows their efficient development	79%	21%
Promotion of spaces for the development of innovations	20%	80%
Open communication with coworkers	63%	37%
Restricted communication with coworkers	53%	47%
Good communication among coworkers	69%	31%
There is a personal development plan which contributes to develop soft skills	76%	24%
There is a training plan for an efficient management of human relations	81%	19%

Source: Own elaboration

When the worker is unsatisfied his productivity may decrease, which has an influence in the generation of innovative processes and therefore the business sustainability. To analyze the commitment of top management with the generation of ideal conditions to create, develop and keep an excellent work environment is a key factor for the improvement and sustainability of business competitiveness (Pérez-Uribe, 2012).

Analyzing the influence of the relations and behavior of workers on organizational performance enables measuring its impact on workers' productivity and satisfaction in order to evaluate possible sources of dissatisfaction to intervene timely, by establishing motivation strategies that contribute to business development and to strength the work culture and environment.

Relation Between Working Environment, Innovation and Business Sustainability

The statistical test was performed to validate the significant correlation among the variables of work environment, innovation and business sustainability. The work environment is the dependent variable, while innovation and business sustainability are the independent variables.

As shown in Table 4, the variation among the three variables is significant. The F-value is 11.06 with a critical value of 3.31 and a probability of 0.00007178, (a lesser value than 0.05). Therefore, it is concluded that there is a positive significant correlation among the three variables, proving that the results are statistically significant.

Table 4. Variance analysis

Origin of variations	*Sum of squares*	*Degrees of freedom*	*Mean square*	*F*	*Probability*	*Critical value of F*
Among groups	58276.289	2	29138.145	11.064465	7.17859E-05	3.1359
In the group	173810.261	66	2633.4888			
Total	232086.551	68				

Source: Own elaboration

The results show the similarity of opinions referring the variables of work environment, innovation, and business sustainability, which shows that the work environment can significantly influence on the processes of innovation and therefore the business sustainability. So, enterprises can make plans for their human resources to make projections of possible innovation scenarios to react to changes in the business environment. This will contribute to create new knowledge and to formulate future actions or strategies that can have an impact on organizational activities.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Work climate is a key factor for the development of processes of business innovation and sustainability through changes that evidence the creation of conditions that impact the sustainable development of both the enterprise and the individual. This is expressed by the strengthening of the worker's skills, who develops creative ideas, therefore transforming innovation into a cyclical process of continuous improvement. It is then when the enterprise becomes resilient and adapts to change by organizational innovation and the ability to restructure itself continuously; the enterprise becomes a living organism that constantly interacts with players and its environment, thus becoming a stronger organization.

A good work environment lets having a suitable knowledge management that strengthen the generation of administrative innovations. Being innovator is not enough now; innovation must be backed by actions that allow having an environment in which people feel comfortable innovating (Ahmed, 1998, cited by Duque Oliva (2015). The enterprise must consider human capital as an intangible asset that has a significant effect on innovations required to answer to market fluctuations, in which administrative processes play an important role when making administrative decisions.

Calderón, Naranjo, & Álvarez (2007) state that the reorganization of processes focuses on increasing productivity and quality through higher working flexibility by 1) the integration of tasks or the elimination of barriers to mobility and 2) the decentralization of decision-making processes. That is why, every internal area of the enterprise requires changes that allow strengthening business strategies, resulting in a knowledge economy from which arises the digital good, the social good, the intangible asset and the emotional well-being, factors that influence the sustainable development of organizations. Restructuration is the way by which business modernization occurs in the departments of human resources.

The development of processes of innovation in Colombian enterprises has focused on infrastructure, markets and products, leaving behind the generation of knowledge through research and the development of human resources. Enterprises consider innovation an important factor for their development and sustainability, therefore, they have implemented personal development plans that contribute to strength their workers' soft skills. However, they do not promote spaces of interaction that make possible the development of innovations, through collaborative work, minimizing the relations and the impact of the work environment over the management of innovative processes that support business sustainability.

The results of this research show that 80% of SMEs in Cucuta are willing to invest in innovation that contribute to strength them as organizations; however, they consider innovation as an activity that

is exclusive of the department of production. That is because, this factor focuses mainly on the development and implementations of new products, leaving behind the strengthening and improvement of organizational activities through processes of administrative innovation. This prevents the generation and creation of ideas, and the evaluation of results obtained by concepts related to the creative processes in the administrative departments.

Besides, 81% of SMEs in Cucuta have plans to strength their workers' soft skills, however, they do not consider the impact that work environment can have on the creation of ideas for innovative processes, which have a significant effect on business sustainability; thus, workers become the main factor for the development of innovations, however, administrative innovation must be developed based on the design of activities performed through teamwork in order to have a holistic vision that contributes to maximize the results of the creation and implementation of ideas that strength administrative processes.

It is a must to minimize the possible effects that workers' personal relations may have on business sustainability. For this reason, 79% of enterprises consider that the effectiveness of teams is the result of healthy and cooperative relations among workers.

Recommendations

Innovation must be considered not only as a tool of technological innovation but also as a process that contributes to business strengthening. Most enterprises have innovated in equipment, software and techniques (Auletta & Ojeda, 2014). So, enterprises must strength their members' soft skills, while at the same time, promotes activities tailored to conflict resolution, resilience, teamwork, risk management, time management, effective communication, team decision-making, stress prevention and personal relations. Furthermore, it is important to have an environment that encourages the creation of ideas without fear to failure or mistakes, considering that innovation is a success-failure process.

It is essential that enterprises change the idea they have about the innovation process, minimizing the fear to failure and increasing the spaces for innovation; they must also strength the resilience of their human capital, which will add to the development of a culture of business innovation as a process used to provide answers to changes in the market, turning their activities into competitive advantages, therefore, contributing to the enterprises' sustainability. Moreover, a good work environment allows to describe the set of perceptions and expectations of workers and their relations at work, which facilitates the assessment of the organizational behavior (Chirinos Araque, Meriño Córdoba, & Martínez de Meriño, 2018). Besides, there are gaps related to the impact of work environment on the creation of innovative processes; therefore, it would be important to develop studies to analyze the impact of workers as social beings, bringing new approaches to research deep into the topic.

Ramírez- Garzón, Pérez-Uribe & Espinoza-Mosqueda (2020) state that innovation and knowledge are not possible without the adequate human resource. Consequently, the business innovation path diagram based on an assertive work environment rests upon on the assessment of the work environment that allows the measurement of the state of the main variables of the enterprise's human resources, being them: resilience, team decision-making, personal relations and emotional salary.

Pérez-Uribe & Ramírez –Salazar (2018) state that any enterprise that wants to grow economically and remain in the market must keep its workers motivated all the time. Therefore, this initial assessment

allows to identify the needs of innovation of workers and the enterprise while at the same time sets the indicators to measure the impact of administrative innovation on workers and the enterprise and identifies those responsible.

Next, an innovation path document, or action plan, containing the necessary resources to implement strategies to strength human resources, focused on the development of administrative innovation, considering the established primary and secondary variables; then, the management of the action plan is set, assigning resources, establishing objectives and goals, evidencing the follow-up of the process compared to the results expected (Auletta & Ojeda, 2014).

For Robayo Acuña (2016) innovation activities along with human resources form one of the main factors that determine the competitive advantages of advanced economies, reason why, the next step is to perform such activities, looking for the involvement of workers and the fulfillment of the implementation of the established action plan; such factors will lead to obtain the results related to the design of ideas that will improve the SMEs process of administrative innovation.

Likewise, Avendaño (2012) and Giraldo & Otero (2017) state that innovation is essential and indispensable in the new global order. Development and progress are unthinkable without innovation at all organizational levels, regarding the type of enterprise. Therefore, in the last stage, an analysis and feedback are performed in order to identify positive and negative actions while at the same time measuring the impact of results obtained. It is expected to find organizational improvements and progress that will contribute to achieve the enterprise's productivity, sustainability and competitiveness. At the same time, the work environment will improve, which will have an effect on human resources.

Montoya Agudelo & Boyero Saavedra (2016) affirm that organizations are highly efficient and competitive when their human resource strategies are aligned to the strategies established by top management; the coherence of these two aspects means that processes executed by human resources guarantee the correct, timely, efficient and valuable achievement of all the goals established by the organization.

This is how the resulting dynamic of the interactions of factors of work environment such as resilience, team decision-making, personal relations and emotional salary influence the characteristics of innovation in enterprises. For such reason, in terms of management, successful organizations know how to motivate people to learn and apply their knowledge to solve problems and search for innovation in a path to achieve excellence (Gonzáles Peláez & Ospina Nieto, 2015). Human resources as source of innovation, incorporating other variables, will boost its influence on innovation as well as the practices of management of human resources or organizational learning (Moreno, Real, & Dolores de la Rosa, 2011). Regardless these efforts, there are gaps in the literature regarding the topic in which SMEs pay more attention to technological innovation rather than to administrative innovation.

FUTURE RESEARCH

This research can be a foundation to develop similar studies in other regions of Colombia or in different countries in Latin America. Researchers must consider the number of SMEs in every geographical area and calculate a statistical sample in the same way was done for this study. For these new investigations it is necessary to consider the difficulty to obtain the data and e-mails of the companies to study. It is necessary to combine the data that are found in a public way (in the case of this investigation of the Cucuta chamber of commerce) and enter the web to compile the email of each one to request their collaboration to fill out the diagnostic tool (Appendix 1).

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KEY TERMS AND DEFINITIONS

Business Sustainability: These are the efforts that a company makes to sustain its economic activity, considering social and environmental factors, and making its management a responsible action with resources. Sustainability is an important concept in the activities carried out by companies because it establishes a measurement parameter regarding how they use their financial, human, and operational resources, and how they treat tangible resources (inputs, materials, and even waste). It is also a way to analyze what business practices they have. Regarding their culture and if they consider, for example, the environment, the community with which they live, or the workers.

Disruptive Environments: Introduction of new processes, methods or products that change the way in which they were traditionally made, adding value to the sector to which they are directed. It also refers to what becomes obsolete, since it is not suitable for the new circumstances of business or consumption. Disruptive environments break with the parameters established as acceptable and their disruptive behavior can be a threat to the stability or coexistence of a society and the organizations that compose it.

Innovation: Conception and implementation of significant changes in the product, process, marketing, or organization of the company with the purpose of improving results.

Organizational Climate: A delicate mix of interpretations or perceptions, what people do in an organization of their jobs or roles and only from them, will they you will be able to know and determine its characteristics. It is a pattern of organizational characteristics with relation to the quality of the internal environment of the institution, which is perceived by its members and directly influences their attitudes.

APPENDIX

DIAGNOSTIC TOOL THE IMPACT OF WORK CLIMATE ON INNOVATION AND BUSINESS SUSTAINABILITY

Objective: Obtain general knowledge related to the organizational climate, innovation, and business sustainability

Note: This information is confidential, the results will reflect a general concept not personalized.

Table 5. Diagnostic tool the impact of work climate on innovation and business sustainability

I. BUSINESS SUSTAINABILITY		
1. Do you work with strategic planning?	YES___	NO ___
2. Has the company formulated Plans?	YES___	NO ___
3. Has the company formulated Objectives?	YES___	NO ___
IF THE ANSWER IS NEGATIVE IN No. 3, CONTINUE WITH No. 10		
4. Does the company communicate the objectives in a clear and understandable way?	YES___	NO ___
5. Are the objectives documented (written)?	YES___	NO ___
6. Are the objectives formulated in measurable and specific terms?	YES___	NO ___
7. Do the objectives interrelate the areas of the company?	YES___	NO ___
8. Are the objectives periodically reviewed, in order to analyze whether they were met (achieved)?	YES___	NO ___
9. Does the organization have objectives focused on the generation of innovative processes for each of the areas?	YES___	NO ___
10. Does the organization respond quickly to government orders?	YES___	NO ___
11. Does the company analyze the projections of the sector?	YES___	NO ___
12. There are methods and procedures to recognize:		
a. Bottlenecks	YES___	NO ___
b. Remove them	YES___	NO ___
13. Does the company establish policies for each area?	YES___	NO ___
IF THE ABOVE ANSWER IS NEGATIVE, CONTINUE WITH No. 19		
14. Are policies documented (written) and aligned with objectives?	YES___	NO ___
15. Does the company continually review policies to reflect changed conditions?	YES___	NO ___
16. Do you know the rules or policies of the organization to have access to: (If you know them, mark with X)		
Medical services ____ Promotions _____ Salaries ____ Rotation ____		
Industrial safety ____ Training ____ Personnel selection ____		
17. Are the policies clear and easy to understand for their application?	YES___	NO ___
18. Does the company have an innovation policy?	YES___	NO ___
19. Does the company have procedures?	YES___	NO ___
20. Do you know the procedures?	YES___	NO ___
21. Are the procedures written?	YES___	NO ___
22. Are the procedures clear and understandable?	YES___	NO ___
23. Does the company support the use of the most advanced technology in its operations?	YES___	NO ___
24. Does each area of the company manage its information through technological systems (ICTs)?	YES___	NO ___
25. Is the company information integrated (network) to the information system?	YES___	NO ___
26. For the management of information systems, do you have a username, password and access level?	YES___	NO ___
27. You consider that the information system used by the company is:		
Good_____ Regular____ bad _____		
Why? _____		
II. WORKING ENVIRONMENT		
28. Are the relationships between work teams healthy and cooperative, allowing their effective development?	YES___	NO ___
29. Is information assertively transmitted to employees (accurate and useful), allowing an increase in organizational effectiveness?	YES___	NO ___

continued on following page

Table 5. Continued

I. BUSINESS SUSTAINABILITY		
30. Do you consider that it is part of the functions of the directors of the company, to advise the collaborators of the organization?	YES___	NO ___
31. Does the company recognize the personal interests of its employees?	YES___	NO ___
32. Do company managers, in conjunction with the human management area, anticipate employee reactions to established controls, ¿so that appropriate changes are made when reactions seem unfavorable?	YES___	NO ___
33. Do the company managers allow changes to the established controls; if at the same time this variation projects satisfaction and effectiveness in the organization?	YES___	NO ___
34. Does the company respond to the needs of its employees?	YES___	NO ___
35. Is a performance evaluation carried out on all employees, in order to measure performance in the development of their activities?	YES___	NO ___
IF THE ANSWER IS NEGATIVE, CONTINUE WITH No. 38		
36. Are the results of the performance evaluation communicated?	YES___	NO ___
37. Does the job evaluation allow you to have a reference to improve your work and personal development?	YES___	NO ___
38. Is the academic level of the collaborators adequate for the performance of the company's activities?	YES___	NO ___
39. Do the collaborators have the skills (technical experience) required and necessary for the optimal development of their activities?	YES___	NO ___
40. Do you feel that the company offers job security to its employees?	YES___	NO ___
41. Does the company allow and promote spaces for interaction between the areas, enabling the fulfillment of its objectives?	YES___	NO ___
42. is satisfied with:		
a. The activities carried out	YES___	NO ___
b. Your work environment:	YES___	NO ___
Office space and furniture	YES___	NO ___
Technology	YES___	NO ___
Grooming and temperature	YES___	NO ___
Coworkers	YES___	NO ___
43. What kind of motivations and incentives does the organization carry out with its employees?		
Training ___ Bonuses ___ Recreation ___ Promotions ___		
Other _____		
44. Does the company determine remuneration based on a salary structure?	YES___	NO ___
45. Does the company consider the design of innovative processes as a salary incentive?	YES___	NO ___
46. Are you satisfied with your salary?	YES___	NO ___
Why? _____		
47. If there is a need to carry out work activities of the organization in overtime, you carry them out by		
Obligation _____ Personal commitment _____ Personal satisfaction ___		
48. Do you consider it important to have good relationships with your co-workers? (Mark with an X)		
Very important ___ Partially important ___		
Not so Important ___ Not Important ___		
49. How is your relationship with your co-workers?		
Very good ___ Good ___ Regular ___ Bad ___		
50. Does the company promote spaces for the development of innovations, through work teams, under the coordination of leaders?	YES___	NO ___
51. Do you feel free to communicate with other co-workers?	YES___	NO ___
52. considers that adding new obligations makes it possible to carry out activities in a more interesting way	YES___	NO ___
53. I believe that work teams can achieve much more than individuals who work alone	YES___	NO ___
54. Does the company have a training plan for the effective management of human relations?	YES___	NO ___
55. Have you stopped talking to a co-worker?	YES___	NO ___
56. Does the company give you the opportunity to fill vacant positions that allow you a promotion?	YES___	NO ___
57. Do the collaborators feel free to communicate their ideas and constructive criticism to their colleagues?	YES___	NO ___
58. Do you have good communication with your colleagues?	YES___	NO ___
59. Do you consider that the company takes your opinion into account when making decisions to change administrative processes?	YES___	NO ___
60. Do you consider that incentives such as bonuses, extra payments, recreation, bonuses for the generation of innovations, etc., ¿motivate you to perform better in your activity?	YES___	NO ___

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I. BUSINESS SUSTAINABILITY		
61. Does the company have a personal development plan that contributes to strengthening its soft skills?	YES___	NO ___
62. You regularly seek feedback from your peers regarding your performance or suitability.	YES___	NO ___
63. I consider it important to continue improving and expanding my skills	YES___	NO ___
64. you are clear about your level of authority and responsibility	YES___	NO ___
III. INNOVATION		
65. you understand the concept of innovation	YES___	NO ___
66. for you, innovation refers to:		
Technology ____ administrative processes ___ Production ___		
Market ___ Other _____ Which one? _____		
67. The company designs innovation processes, through the planning of its processes	YES___	NO ___
68. Has carried out activities that contribute to innovation	YES___	NO ___
69. Adequate and consistent measurements are made in the innovation processes implemented by the company	YES___	NO ___
70. Do you consider that the company fosters a culture of innovation within the organization?	YES___	NO ___
71. The company establishes innovation strategies	YES___	NO ___
72. The company allocates the necessary resources to implement organizational innovation activities	YES___	NO ___
73. The company fosters spaces that contribute to teamwork for the generation of innovative ideas	YES___	NO ___
74. The company focuses innovation on the development of new products and / or services	YES___	NO ___
75. The company focuses innovation on strengthening and improving organizational processes	YES___	NO ___
76. In the development of innovation processes, managers are assigned, at the same time that several collaborators are involved	YES___	NO ___
77. The company encourages the creative processes of employees for the development of innovations	YES___	NO ___
78. The company generates spaces for the development and evaluation of organizational innovations	YES___	NO ___
79. Considers that innovation is exclusive to the production area (production process) of the company	YES___	NO ___
80. The results obtained by the implemented organizational innovations are evaluated.	YES___	NO ___
81. There are indicators that really measure the impact of the organizational innovations implemented	YES___	NO ___
82. Considers that innovation is an important factor for business development and sustainability	YES___	NO ___
83. You consider that human resources are an important factor for the development of organizational innovations	YES___	NO____

Source: Own elaboration

Chapter 8
Instrument Validation of Organizational Dimensions That Learn in a Context of Chaos

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ABSTRACT

The ability to learn and thus adapt to change is without doubt one of the most effective tools to emerge victorious in the face of chaos. But how do you know if an organization has this capability? The objective of this study is to validate the instrument of the dimensions of the organization that learns DLOQ (Dimensions of the Learning Organization Questionnaire). The DLOQ has 21 items or reagents distributed in seven different but related dimensions. The instrument seeks to be an initial intervention tool for contexts of chaos. The instrument was applied with a total of 21 items, in 14 organizations in the southern center of the state of Guanajuato, in Mexico, achieving the application of 536 valid cases. Based on the factor analysis carried out in the SPSS program, two important dimensions are observed, one of which is more important and contributes to 34,113% of the total average, a second factor of 28,764% of the total average. Factor one is called the organization's ability to learn, the second dialogue, and team learning.

INTRODUCTION

Nowadays, the organization faces several challenges, including a global economy, new competitors and derived from the COVID-19 outbreak, many of the organizations have taken remote leadership, in addition to the use of new technologies, staff motivation needs, as well as to safeguard the security of human capital by managing changes in work patterns. Many of these challenges require an effective and opportune intervention, but above all, a strategy not previously planned or adjusted, that is, an analysis, generation of strategies and learning methods is required with a reduced learning curve in time.

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All the above generates chaos in the organization as it becomes a complex system due to the incidence of endless variables. Scientists call chaotic to those complex non-random movements that show a very rapid expansion of errors, which prevents finding the growth rate and therefore inhibits the possibility of being predictable in time (Pidal, 2009). With chaos, therefore, the idea of non-linearity in science is embedded and, in general, the enormous difficulty of predicting the evolution of some systems is established (Moncaleano, 2018).

For more than a decade Yang et al., (2004) argue that many researchers in the organization have concluded that an organization's learning capacity will be the only sustainable competitive advantage in the future. Starkey et al., (2004) note that even Michael Porter, authoritarian of strategies, believes that learning plays an important role in the success of companies in the future. It is through learning that knowledge becomes an essential competitive resource for an organization, as mass production is superseded by information and knowledge (Rastogi, 2000).

On the other hand, an organization that learns is not only one that shares the right way of doing things, nor that all learning is oriented to the alignment of institutional philosophy, it may be doubted that what is learned is not best practices, or that what has been learned is not aligned with the objectives of the organization Even what is not documented in an organizing manual, the practices that the staff know and have experienced have been repeatedly communicated without the need for a formal medium and it becomes part of the culture. The lack of a correct application of the organization's capacity to learn can also generate poor performance and therefore a competitive disadvantage. Although this is an issue that seems to only concern the organization, the individuals involved have a decrease in their ability to achieve that directly impacts the personal and professional satisfaction of each individual.

A complexity that is found when addressing the subject of organization that learns is derived from the fact that learning can be seen as knowledge, however, this work addresses the concept of an organization that learns as characteristics of development and growth; not being merely of knowledge.

Because of today's challenges, the ability to learn and thus adapt to change is undoubtedly one of the most effective tools for overcoming chaos. But how do we know that an organization can learn? To generate a strategic plan, it is necessary to know the organization's current diagnosis of the ability to learn, particularly in rapidly changing and demanding chaotic environments for companies to generate equally rapid responses that are constantly adapted to survive and thrive.

Watkins and Marsick (1997) developed a questionnaire to diagnose an organization's will to learn and called it the Dimensions of the Learning Organization Questionnaire (DLOQ). The questionnaire was validated in about twenty countries and crops. No evidence that validation was carried out in Mexico.

It seeks to improve practices related to human capital development, as well as to implement innovative practices so that staff in the region is qualified and to meet the demands of international industry in a chaotic framework derived from a health pandemic.

Considering that, to initiate an intervention, a diagnosis is necessary, the use of tools such as DLOQ will be of great use, so it is important for validation and reliability of this questionnaire in the state of Guanajuato, Mexico.

Therefore, the aim of the study is to:

Validate the instrument of the dimensions of the learning organization (Dimensions of the Learning Organization Questionnaire).

At present we are in a globalized world where economic, political, social, cultural, and technological variables are integrated and are changing the ways in which countries and subjects interact.

A small or large organization can achieve a global reach from its inception, and this involves adaptations regarding the international division of labor, foreign direct investment, global production chains, productive decentralization, innovation and technology transfer, organization of work and the labor relations system, are due to a unique phenomenon and are widely interrelated (Pozas, 2001).

This phenomenon drives abrupt changes and organizations must be prepared for a proper adaptation that involves change. The ability to adapt always gaining a competitive advantage that has been a subject of study in the last decade and is known as the ability to learn from the organization.

When we say that the organization has the ability to learn, we really refer to intellectual capital and knowledge management and it is defined by seven dimensions that are addressed in this document.

This ability to learn should be measured in the organization to understand the adjustments or improvements that must be applied in a timely manner to achieve the objectives that have been set. Watkins & Marsick (1997) developed the questionnaire of the dimensions of the organization they learn, DLOQ (Dimensions of the Learning Organization Questionnaire).

This document captures the results of exploring the validity and reliability of the instrument in the Mexican Bajio region. There is talk of a context of chaos due to the complexity in the management of variables and at different levels of the organization.

THEORETICAL FRAMEWORK

1. Organization That Learns

The concept of an organization's learning is expanding their fields of application in the areas of human resources, administration and even in school systems (Egan et al., 2004; Wang et al., 2007). The interest in the topic of an organization's learning is because organizations seek organizational success, as well as finding competitive advantages, that is why this topic has had a special attention in recent decades (Ellinger et al., 2002; Gilley and Maycunich, 2000; Leonard, 1998; Tsang, 1997). Three of the works that have made their mark about organizations that learn: Organizational Learning: A Theory of Action Perspective Reading (Argyris and Schon, 1978); The Fifth Discipline: The Art & Practice of the Learning Organization (Senge, 1990); and Sculpting the Learning Organization: Lessons in the Art and Science of Systematic Change (Watkins and Marsick, 1993).

Watkins and Marsick (1993,1996) define learning companies as those that capture, share, and use knowledge to change the way organizations respond to new challenges. These authors also describe seven dimensions needed for the organization to begin to become a learning organization: creating an opportunity to promote continuous learning, promoting dialogue and consultation, promoting collaboration and team learning, driving or empowering people toward a collective vision, establishing capture and learning, sharing systems, connecting organizations to their environment, and providing leadership strategies for learning.

2. Chaos, Complexity, Chaordic System

"Chaos in Organizations" was mainly used in its common sense, meaning, i.e., "chaos," "chaos theory," a popular pseudonym for dynamic systems, a theory that originally developed in mathematics and spread to the natural sciences, biology, and chemistry in the late 1970s and early 1980s. Liu (1999, p. 9) describes

classical chaos as:"Recurring, random and a-periodic behavior generated from nonlinear determinists Equations with sensitive dependence on initial system conditions."

From the 1990s onwards, "complexity" rather than chaos, is increasingly used to indicate an emerging field of study in organization and management literature.

Maguire and McKelvey (1999) distinguish five different forms of complexity, of which "deterministic chaos" is just one of them.

Waldrop (1992, p. 11) states that:

Complex systems are characterized by:

a. A large number of independent agents interacting with each other.
b. Systemic interactions that can lead to spontaneous reactions, self-organization; and
c. Learning that takes place through feedback.

A chaordic system is a complex and dynamic arrangement of connections between elements forming a unified whole whose behavior is both unpredictable (chaotic) and patterned (ordered) simultaneously (Fitzgerald, 1997, p. 1).

Frans and Goran (2004) expose the concept of the chaordic enterprise (chaordic enterprise CE) defined by them as a complete system and a dynamic organization that operates in a complex nonlinear dynamic environment and is inseparable. They comment that the chaordic enterprise is the final state towards which an organization can evolve seen as a learning organization and, on the other hand, they propose the concept of chaordic systems thinking (CST) as a metamodel to define capacity of the organization to learn where it characterizes by self-organization and make transformative changes in hyper-turbulent conditions.

3. Organization That Learns and Chaos

The relationship between an organization that learns, and chaos is that what was once chaotic is now normal in an organization thanks to the ability to learn from that organization. Chaos does not go away, just extends the boundary of space at a faster rate each day, experience it, and take advantage of it can lead to a release of stress. Organizations that are maintained will be the ones that increase their learning speed.

The learning that is generated by trial and error generates costs to the organization, if each individual is isolated and did not share their experience in an organization in addition to the financial cost the variable time is added, add these variables in an ever-chaos system, generates greater complexity in the system, however, if knowledge is shared as well as experiences, the organization lowers costs in addition to reducing the time gap, which is why the importance of aiming strategic objectives in improving the organization's ability to learn.

Today there is a tendency to generate tools that bolster the ability to learn in organizations, for example, they test the efficiency of gamification (Orlova et al., 2015) as a way to lead an organization to be an intelligent organization i.e., with the ability to learn.

Miles (2019) in his book "Learning Chaos engineering: discovering and overcoming system weaknesses through experimentation" presents an alternative for organizations to avoid costly failures in their complex systems through contracted experimentation where human capital can obtain system weaknesses, this implies that with controlled experiments the human capital involved in the complex systems studied have an apprenticeship in system behavior in crisis, and thus resort to errors.

Flores & Lugo (2018) discussed that learning organizations are the ones that give access to all their collaborators to meaningful learning. They constantly transformed to overcome the adversity of the chaotic market. This corporations bias is not only acquiring new knowledge and skills, they focused in social activities in a whole collaborative environment. They gathered and integrated experiences, skills, knowledge and abilities in their own community to achieved knowledge and wisdom coming from chaos.

Colina & Albites (2020) added that innovation comes from chaotic learning, particularly assigning creativity, management, human talent and resources to afford productive results for the entire organization including collaborators. Further they express the importance of re-engineering, this is a process that learning is focused in participation, systemic view, sharing and collaboration. This new organizational culture that ascent from crisis and has his basis in continue learning allows abilities, skills and capabilities development.

From his perspective Flores (2017) in a former research in Lima Perú, stablished a goal, to know how small craftsmen businesses evolved in a chaotic environment. And to know the effect in their small organizations. He realized that living in complex environments, give them chaotic lessons and to overcome tough internal and external situations focused in change and progression, nevertheless, some times this is not possible because the "hook" as the author mentioned are the bureaucracy, short term management, lineal & cause thinking and organizational models that hinder learning and change adaptation, stopping agility.

4. The Development of DLOQ (Dimensions of the Learning Organization Questionnaire)

Some of the strongest criticisms faced by human resources departments in organizations is the lack of measures to evaluate applications empirically in the workplace (Holton, 1996, 2005; Holton et al., 2000; Tsang, 1997; Yang et al., 2004).

The efforts of Watkins and Marsick (1993, 1996, 1997) are of great importance in the construction of the basic notions of the measurement factors of the organizations that learn.

Watkins and Marsick (1993, 1996, 1997) proposed the DLOQ, a constructivism concept to measure the level of predisposition of organizations for learning, the DLOQ has seven dimensions of factors related to learning oriented both to people and to people components of the organizational structure.

DLOQ is a questionnaire that measures a subjective variable, which is an organization's willingness to learn. This type of variable is not measured by means of a mechanical apparatus as is an objective variable, but a documentary instrument is used.

The DLOQ questionnaire is already built and validated in different cultures, countries, and contexts.

What types of documentary measuring instruments are there? There are the questionnaires, scales and inventories. A questionnaire has dichotomous answers (correct or incorrect), scales have an ordinal variable, inventories have polychotomous variables.

Although the DLOQ by its acronym is defined as a questionnaire in its functioning, it uses a scale, which is the Likert scale. Where assessed participants indicate that they agree or disagree with a series of proposed statements. This type of scale is widely used to know the degree of agreement or disagreement, widely used to know attitudes, behaviors, and opinions.

The variable studied is the predisposition of organizations to learn; due to its complexity, it cannot be studied as a whole, but must be broken down into constituent parts or dimensions.

A dimension is an integral element of a complex variable, which results from its analysis or decomposition.

Yang (2003) uses the dimensions of DLOQ to measure the learning of culture in organizations, the abstract concept of the organization that learns is the mirror of organizational behavior, for this reason the instrument is classified as of scale, it is essential to diagnose that behaviors incentivize this characteristic to establish action plans, according to this author states that "it is essential to have valid and reliable validation instruments in the measurement of this abstract concept" (Yang, 2003, p. 152). DLOQ, although not a perfect tool; it is very useful for this task.

In turn, the questionnaire has been useful to lay the foundations for reengineering in the directorates of organizations that are interested in learning. The dimensions have been used to check the perceptions of the participants regarding the characteristics of the organization. The table 1 defines the dimensions of the questionnaire and indicates which question of the questionnaire evaluates which dimension.

Table 1. Definition of dimensions and relationship with the DLOQ questions

Question	Dimension	Definition of dimension
1,2,3	Create opportunities for continuous learning	Learning is built into work so people can learn in the context of work. There are continuous learning opportunities for all its members.
4,5,6	Promote dialogue and inquiry	People acquire productive thinking skills to express their points of view and the ability to listen to and inquire about the opinions of others; culture is modified to support questioning, feedback, and experimentation.
7,8,9	Encouraging collaboration and team learning	The work is designed to use groups to access different ways of thinking; groups are expected to work and learn together; collaboration is valued by the culture and rewarded.
10,11,12	Create systems to capture and share learning	Organizational processes to create and share a collective vision and obtain feedback from its members about the gap between the current situation and the new vision. Systems are in place to share learning.
13,14,15	Empower people towards a collective vision	People are involved in establishing, having, and implementing an overview. Responsibility in decision-making is distributed to motivate people to know the responsibility they have.
16,17,18	Connect the organization with its environment	People are helped to see the effect of their work across the enterprise, explore the environment and use the information to adjust work practices, the organization is linked to their communities.
19,20,21	Stimulate strategic leadership for learning	Leaders model, prestige, and support learning; leadership uses learning strategically to get better results.

Source: Adapted from Watkins and Marsicks 1997

As previously mentioned in the theoretical framework, the model that is presented about predisposition to learn defines levels within the organization, the table 2 shows at what level of the organization each of the dimensions studied is related.

METHOD

This section defines the way in which research is approached. The follow-up is exposed to the objective, the scope and focus of the investigation are defined; The population and sample are described, as well

Table 2. Levels of dimensions

Levels	Dimensions
Individual	Continuous learning Research - dialogue
Team / Group	Collaboration
Organizational	Integrated System System connection Training Strategic direction

Source: Bolívar, 2012

as the collection instrument, the research design is explained, detailing the procedure for applying the questionnaire.

The central objective of this research work is to validate the DLOQ questionnaire in its Spanish version consisting of 21 items (see Appendix 1, table 14 and table 15); organizations in southern central Guanajuato state, Mexico. To do this, a content validity analysis, construct, and the reliability of the instrument is determined.

The scope of the research is defined as exploratory in its first stage, since there is no knowledge of the conduct of such studies in the region, as well as in the country. There is no evidence that the questionnaire was applied to Mexico in the literature review.

The questionnaire was selected, as it is the most used to measure the capacity of an organization to learn, it evaluates seven dimensions, which define the characteristics that a learning organization must have and is supported by the Likert scale. This is of fundamental importance to understand the validation procedure of the instrument, although the DLOQ by its acronym is defined as a questionnaire, it does not have dichotomous variables to evaluate an item as true or false, but instead uses the Likert scale and is processed as a scale instrument. To check the validity of the construct as reliability, a statistical analysis of the responses that the people of the organizations answered in each questionnaire are carried out, which is why this study has a quantitative approach.

The research is based on the premise that the application of the DLOQ questionnaire in various organizations in south-central Guanajuato is valid and reliable. At this point it is vital to point out that the method was planned thinking in the context of chaos in which the studied organizations operate, which is why a valid and reliable questionnaire was required to diagnose their willingness to learn from good and bad experiences.

The sample for this research was intended to maintain the quality of heterogeneity in relation to the types of organizations, their size and complexity. For the study, it can be defined that the population includes all those organizations that are located within the south-central zone of the state of Guanajuato, whether they are manufacturing, commercial or service organizations. Fourteen organizations from the region participated.

The nature of the instrument makes no difference between for-profit and not-for-profit.

The table 3, is a description of the organizations taking part in the study.

Table 3. Organizations participating in the study

Organization Identification	Description
H	Government institution dedicated to providing health services to the population.
P	Public administration
CC	Call center
I	Main company within the textile industry in Mexico markets technical and specialized fabrics with constant innovation.
Co	Manufacture of outerwear with knitted fabric.
M	Multinational that designs, produces and distributes appliances in more than 70 countries around the world.
S	Educational organization
HON	Automotive company
PREPA	Government institution dedicated to providing secondary education services.
CON	Government institution dedicated to providing secondary education services.
CT	Government institution dedicated to providing secondary education services.
MB	Private enterprise dedicated to growing, packing and freezing vegetables and fruits.
CF	Administrative offices of a production company in charge of controlling, generating, transmitting, and commercializing electrical energy.
IT	Government institution dedicated to providing postsecondary education services.

Source: Own elaboration

Gathering Instrument

The Spanish version of the dimension questionnaire of the learning organizations provided by Hernandez and Watkins (2010) was used. The DLOQ has twenty-one items distributed in seven different but related dimensions.

The DLOQ questionnaire is evaluated on a Likert scale ranging from "almost never" with a value of 1 to "almost always" with a value of 6. Refer to Appendix 1 for the survey (table 14 and table 15).

This research has a non-experimental and crosscutting design with an exploratory and descriptive scope. We will refer to figure 1. to point out the design of the research.

Content Validity

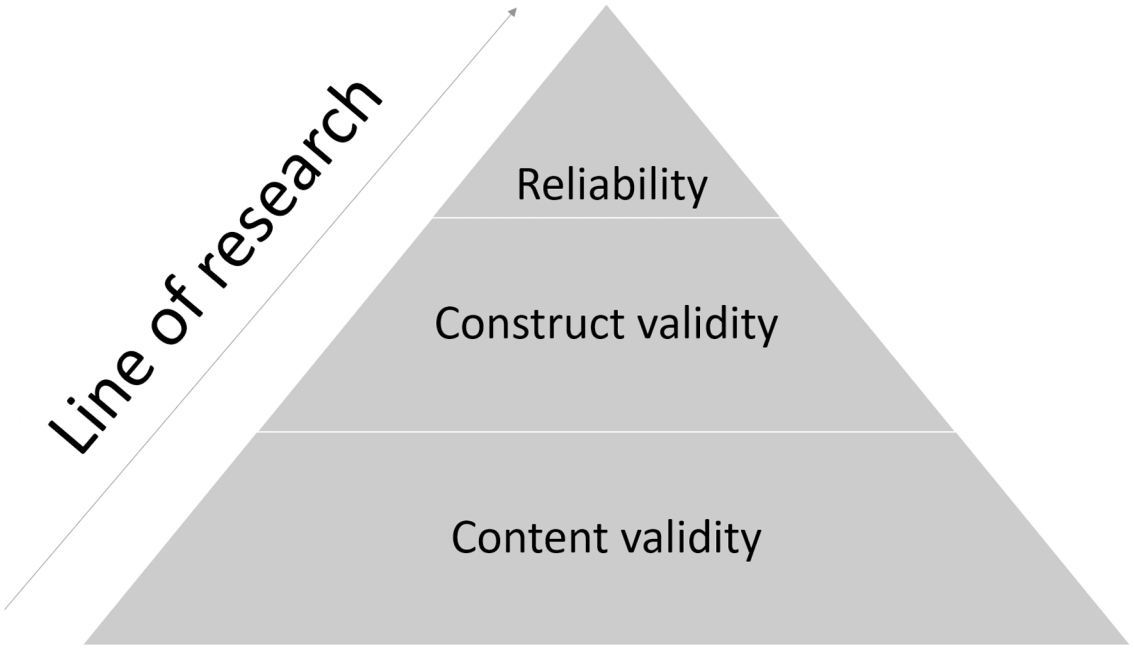
Three times are suggested for the validity of the content (refer to Figure 2). Although content validation is suggested for the construction of an instrument, this research considers this step important because there is no evidence that the concept has been addressed in Mexico.

Figure 2 graphically shows the three moments of content validation and is explained below:

Knowledge: A rational validation is sought, when there is a bibliography or documentation, in the case of DLOQ these are dimensions that define experts based on previous theories about organizational learning.

Population: response validation is given by the diversity of studies carried out around the world where the DLOQ has been applied.

Figure 1. Research design
Source: Supo, 2016



We may use one or three moments as presented in the validity of the content.

In the case of this research, it is supported by the moment of knowledge, which is confirmed by the results obtained from the population studied.

Construct Validity

It is the validity of the concept; it makes sure that what we're really evaluating is the capacity of an organization to learn. It should contain all the elements that contain the concept, nothing more, nothing less. To evaluate the construct, we must make sure that all the variables that it must meet are being covered, that is why it is important to size the concept and this procedure is called dimension reduction.

Reliability

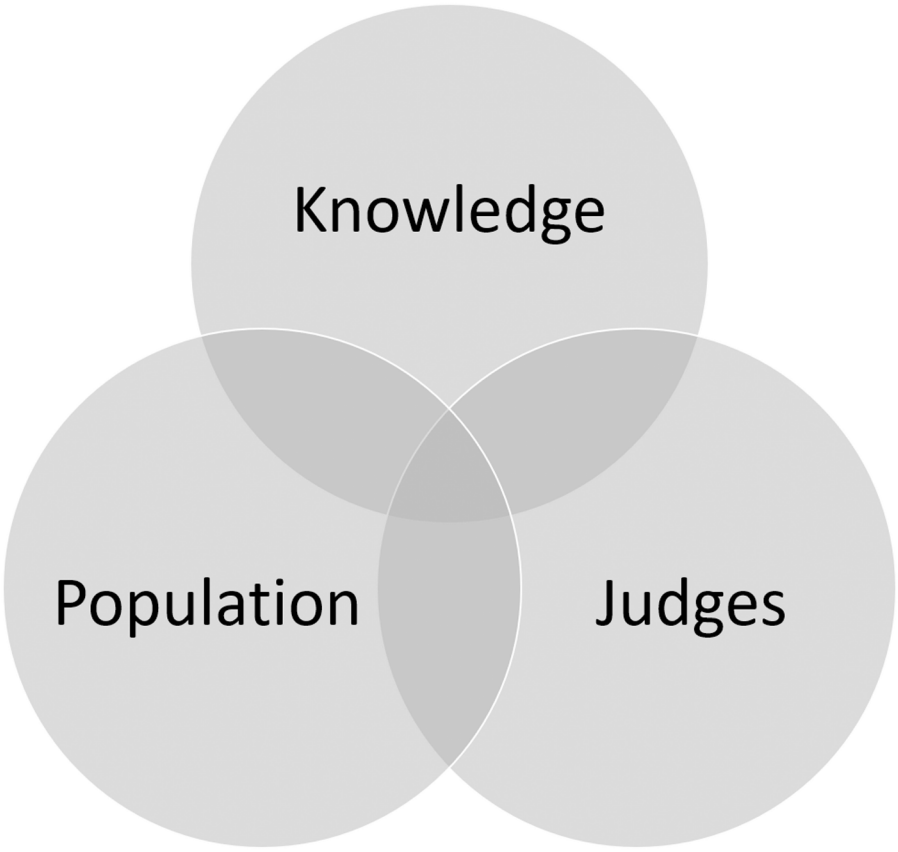
We can even have content validity and construct validity, but not have reliability. This refers to how far-fetched the questionnaire is to answer it. If high and low difficulty questions are written. The instrument must have an intermediate level of difficulty in answering. It seeks to have a good discriminating ability.

The steps in this analysis are described below:

1. Literature review.
2. Application of the questionnaire
3. Assessing the validity of the content.
4. Assessing the validity of the construct.

5. Reliability calculation.

Figure 2. Moments of content verification
Source: Supo, 2016



a. Literature Review

A complete search is performed to locate documents related to DLOQ, organizational learning and learning organizations. Once the dimensions of the questionnaire and its items are known, there are also important findings regarding different versions of the questionnaire, translations into different languages, and the application of different studies in a vast diversity of countries. It is important to keep in mind that the questionnaire measures organizational behavior.

b. Application of the Questionnaire

To access the study population, a leader from each of the clusters was contacted, an interview was conducted with each of them where the importance of the research was explained, the basic concepts and how to apply the questionnaire, it is indicated that the different hierarchical levels must be taken into account and that they must request a response to all the items of the questionnaire, right there it

is possible to perceive the willingness and interest in the study participation. Some of the participants questioned the usefulness of the study in their organization. They were informed that if the questionnaire were valid, they would have a result on the predisposition to learn in their organization and if the questionnaire were not valid, they would be informed as well.

c. Assessing the Validity of the Content

In this section what is achieved is to clearly present how and under what theories the dimensions of the organization that learns from the questionnaire by Watkins and Marsick, 1998 are formed. Many studies found show the application of the questionnaire and mention the theory on which the authors of the questionnaire are based. It is fundamentally important to find the epistemological basis for the interpretation of the results. Content validity is normally used for the construction of a questionnaire, it is clarified that this is not the objective of the research, however, this type of validity is expressed in the research design to support this research work.

d. Assessing the Validity of the Construct

At the time of this study a considerable number of works have been carried out to verify the validity and reliability of the measurements of the organizations they learn, in different cultural contexts: The United States, Colombia, China and Taiwan (Elliger et al., 2002; Lien et al., 2004; Zhang et al., 2004; Hernandez, 2010). The results of these works have verified the applicability of DLOQ in different cultures, providing internal consistency in alpha coefficient reliability from 0.71 to 0.91 and reliable structure factor of the dimensions of companies that learn (Lien et al., 2006).

In step "a.- Literature review" of this research, the use of exploratory factor analysis, confirmatory factor analysis and Cronbach's Alpha is repeatedly found to validate the DLOQ.

An EFA (exploratory factor analysis) was used for this study to examine the validity and applicability of measurement construct hypotheses in the culture studied. According to Kline (2005), "the EFA technique analyses a priori measurement models in which both the number of factors and their correspondence with indicators are explicitly specified" (p. 71). EFA analysis is the appropriate method for validating hypothetical measurement for three reasons: (1) DLOQ measurement has been developed on a theoretical basis; (2) verifies the adequacy of element-to-factor associations; and (3) examines the validity of the construct of the theoretically proposed measure (Hair et al., 2006; Yang et al., 2004; Thompson, 2004; Thompson & Daniel, 1996).

Reliability Calculation

For the internal consistency of the element, a zero-order correlation analysis and scale reliability tests were used.

The Inter-correlation of items and the alpha estimates of the Cronbach coefficient are the initial steps to examine the reliability of the proposed items in terms of the internal consistency of the measures (Yang et al., 2004).

RESULTS

The total number of questionnaires retrieved from the 14 organizations was 536 valid questionnaires.

The component that has the lowest response rate is number 14, "My organization enables people to control the resources they require to do their jobs.".

The highest standard deviation is at item 3 (this is shown in table 4) "3. In my organization, people are recognized for their learning", where we find a deviation of 1.910, there is no deviation greater than 2 points in the sum of the questionnaires studied.

Validity of the Integrated Study Construct

Similar to the first and second application when integrating total data for KMO analysis. In our data the KMO value is equal to 0.966 therefore, the test result is very good and greater than the differentiation by applications this can be seen in Table 5. This shows enough evidence to know that it is appropriate to do an exploratory factor analysis.

Table 6 shows the commonalities initially assigned to the variables (initial) and the commonalities reproduced by the factorial solution (extraction). The commonality of a variable is the proportion of its variance that can be explained by the factorial model obtained. Studying the commonalities of the extraction we can assess which of the variables are worse explained by the model. For our data that we are processing, we realize that item with less participation is 10 and 3 with a value of 0.531.

Based on the analysis of factors carried out in the SPSS program, two important factors are observed, of which one of them is the most important and that contributes to 34.113% of the total mean, a second factor of 28.764% of the total mean. The results of this measurement can be seen in table 7.

The sedimentation graph for the first questionnaire application that we observed in figure 3. shows the two components that have a value greater than one and we clearly note that there are two.

In this study for the second application, the rotated matrix in table 9 shows that the rotation process is hindered, so the values of the component matrix in table 8 are used to establish the factors 1 and 2 that are described in table 9.

Table 8 shows that, for the first factor, all the items have a value greater than 0.69, which means that each question in the questionnaire contributes to the dimension that we have called the ability to learn. For factor two it is important to make a detailed analysis since the factors contributed by each item have a greater dispersion than for factor one. For factor two supported by the position column, we note that the 4 highest values are within two dimensions, that corresponds to the dimension of investigation and dialogue, contributing with items 4, 5 and 6; the dimension that corresponds to the dimension of collaboration and team learning contributes with item 8. As such, we will refer to the second factor as collaboration, team learning, research and dialogue. This can be seen in Table 9 and Table 10.

Factor one is called the organization's ability to learn, the second dialogue, and team learning.

Reliability

The alpha-Cronbach coefficient obtained for the entire scale was 0.963 (with 21 items and 536 valid cases, since they were considered "missing values" when they did not respond to one of the items). If it is considered that this coefficient measures the degree to which an instrument produces consistent results over time, and that it varies between 0 and 1, where "zero" represents null reliability and "one"

Table 4. Total descriptive statistics

Descriptive statistics						
	N	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**	**Variance**
1. In my organization, people work together to learn.	595	1	6	4.00	1.756	3.084
2. In my organization, we provide people with time to help them learn.	595	1	6	4.00	1.759	3.094
3. In my organization, people are recognized for their learning.	590	1	6	3.38	1.910	3.648
4. In my organization, feedback is provided in an open and honest manner.	588	1	6	3.88	1.747	3.051
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	593	1	6	3.77	1.849	3.419
6. In my organization, people try to build trust among themselves.	593	1	6	3.83	1.784	3.183
7. Within my organization, teams and groups are free to change their goals as needed.	592	1	6	3.85	1.860	3.461
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	592	1	6	3.70	1.810	3.275
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	591	1	6	3.83	1.818	3.303
10. My organization develops systems for measuring the difference between the current and expected performance.	585	1	6	3.89	1.850	3.422
11. My organization puts its knowledge and wisdom in the hands of all employees.	583	1	6	4.02	1.761	3.103
12. My organization measures the results of the time and resources that go into training.	583	1	6	3.94	1.802	3.247
13. My organization recognizes individuals who take initiatives.	583	1	6	3.68	1.868	3.488
14. My organization enables people to control the resources they require to do their jobs.	580	1	6	3.93	1.796	3.226
15. My organization supports employees when they take calculated risks.	582	1	6	3.66	1.817	3.301
16. My organization encourages people to be global thinkers.	584	1	6	3.79	1.844	3.402
17. My organization works together with the outside community to solve mutual needs.	583	1	6	3.89	1.812	3.284
18. My organization encourages individuals to find answers across the organization to solve problems.	581	1	6	3.90	1.798	3.231
19. In my organization, leaders advise and train those they lead.	585	1	6	3.92	1.860	3.461
20. In my organization, leaders continually look for opportunities to learn.	587	1	6	4.02	1.840	3.387
21. In my organization, leaders make sure that the actions of the organization are in line with its values.	586	1	6	3.95	1.820	3.312
Valid N (according to list)	536					

Source: Own elaboration with research data.

Table 5. KMO and total Bartlett test

KMO and Bartlett test		
Kaiser-Meyer-Olkin measure of sampling adequacy.	0.966	
Bartlett's test of sphericity	Approximate chi-square	8311.206
	gl	210
	Sig.	.000

Source: Own elaboration with research data.

represents absolute reliability, it can be stated that the result obtained for this instrument provides a high level of reliability. Refer to Table 11, Table 12 and Table 13.

As we can see, factor two in the three phases of the study only contemplates the first three dimensions of the questionnaire, these three dimensions are found at the individual learning level and at the team or group level.

For this factor two, the dimensions related to the level of organizational learning, or overall, are not taken into account.

DISCUSSION

The objective of validating the questionnaire is fulfilled, although it is not broken down into seven factors as in other countries, it is clear that it does so in two for the area of application. This instrument is recommended to be applied after periods of chaos, considering the two factors that were validated: capacity of the organization to learn and dialogue and team learning, to detect, integrate and sustain the knowledge and capacities obtained by the main asset of the organization: human capital. According to Begbie et al., (2002), learning in chaotic conditions is seen as a discovery process, which is why it is concluded that the instrument can be applied in chaotic conditions as part of the proposals to learn from the turbulent environments.

In terms of reliability, the results obtained do not demonstrate that any of the items should be eliminated to obtain higher reliability, having the 21 items we obtain a reliability of 0.963 (see table 12), which is a value very close to one.

Generated from the analyzes carried out, it is concluded that it is a single-factor instrument, that is, all the components are found in: the organization's ability to learn. This means that the instrument is valid and reliable for the study sample, nevertheless, it does not correspond with the literature review, where seven factors are found.

When reviewing the literature, the validation of this questionnaire was found in different parts of the world, in those studies that are presented, the reliability and validity of the questionnaire has been demonstrated, including the construct validity in the seven dimensions. However, in the study described in this document, it is observed that construct validity shows evidence to contemplate two factors or dimensions, one weaker than the other, for this reason one is referred to in the previous paragraph to a greater extent.

Table 6. Total commonalities

Communalities	Initial	Extraction
1. In my organization, people work together to learn.	1.000	.544
2. In my organization, we provide people with time to help them learn.	1.000	.554
3. In my organization, people are recognized for their learning.	1.000	.531
4. In my organization, feedback is provided in an open and honest manner.	1.000	.672
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	1.000	.686
6. In my organization, people try to build trust among themselves.	1.000	.617
7. Within my organization, teams and groups are free to change their goals as needed.	1.000	.574
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	1.000	.647
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	1.000	.654
10. My organization develops systems for measuring the difference between the current and expected performance.	1.000	.531
11. My organization puts its knowledge and wisdom in the hands of all employees.	1.000	.625
12. My organization measures the results of the time and resources that go into training.	1.000	.604
13. My organization recognizes individuals who take initiatives.	1.000	.647
14. My organization enables people to control the resources they require to do their jobs.	1.000	.636
15. My organization supports employees when they take calculated risks.	1.000	.664
16. My organization encourages people to be global thinkers.	1.000	.662
17. My organization works together with the outside community to solve mutual needs.	1.000	.657
18. My organization encourages individuals to find answers across the organization to solve problems.	1.000	.704
19. In my organization, leaders advise and train those they lead.	1.000	.695
20. In my organization, leaders continually look for opportunities to learn.	1.000	.629
21. In my organization, leaders make sure that the actions of the organization are in line with its values.	1.000	.672
Extraction method: Principal Component Analysis.		

Source: Own elaboration with research data.

Table 7. Total variance explained by the total

Total variance explained									
Component	Initial eigenvalues			Sums of the squared saturations of the extraction			Sum of the squared saturations of the rotation		
	Total	Variance %	Accumulated %	Total	Variance %	Accumulated %	Total	Variance %	Accumulated %
1	12.039	57.327	57.327	12.039	57.327	57.327	7.164	34.113	34.113
2	1.166	5.551	62.878	1.166	5.551	62.878	6.041	28.764	62.878
3	.765	3.645	66.522						
4	.685	3.260	69.782						
5	.641	3.050	72.833						
6	.549	2.613	75.446						
7	.534	2.545	77.991						
8	.493	2.347	80.338						
9	.463	2.206	82.544						
10	.444	2.116	84.660						
11	.393	1.872	86.532						
12	.374	1.780	88.312						
13	.366	1.741	90.052						
14	.324	1.543	91.595						
15	.313	1.493	93.088						
16	.302	1.436	94.524						
17	.266	1.265	95.789						
18	.257	1.225	97.013						
19	.231	1.101	98.114						
20	.210	1.001	99.115						
21	.186	.885	100.000						
Extraction method: Principal Component Analysis.									

Source: Own elaboration with research data.

Future research about an organization that learns has been considered as one of the tools for the diagnosis of learning derived from chaos environments. Other interesting studies to be carried out will be the correlations of an organization's ability to learn with respect to characteristics such as leadership, financial performance, moral contract, use of innovation, job satisfaction and motivation, among others, particularly after the context of the COVID-19 pandemic.

In conclusion, it is worth emphasizing that the DLOQ instrument is the most widely accepted worldwide in terms of measuring the organization's ability to learn; In this case, its validation and exploration for the first in the southern center of the state of Guanajuato has tried to contribute to enrich the results already existing in other parts of the world in which this instrument has been applied. With regard to the results obtained through the present study, they can be considered as the first effort that paves the way for other studies that analyze this instrument with two factors: capacity of the organization to learn and dialogue and team learning, to confirm the consistency in other populations in central Mexico.

Figure 3. Total sedimentation graph
Source: **Own elaboration with research data.**

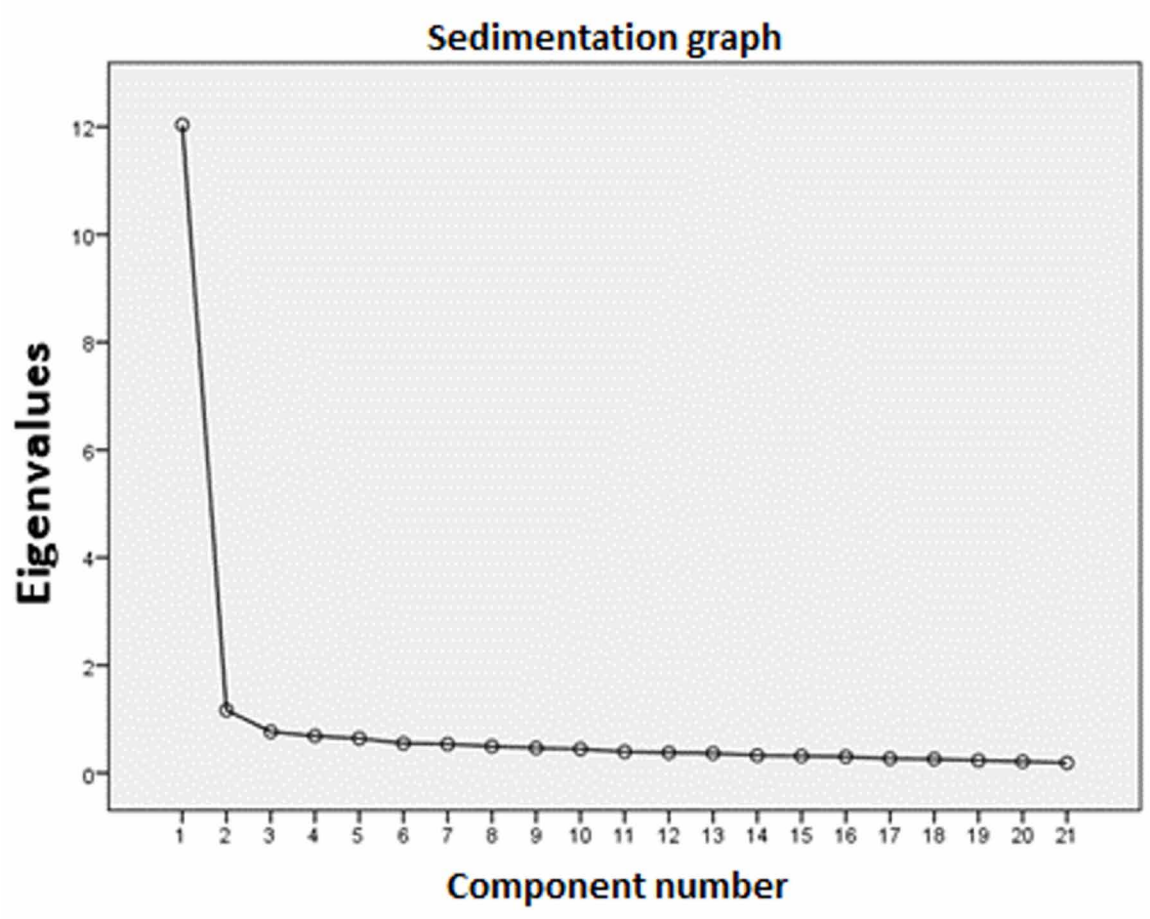


Table 8. Total component matrix

Component matrix[3]	Component		Position
	1	2	
19. In my organization, leaders advise and train those they lead.	.816	-.168	
18. My organization encourages individuals to find answers across the organization to solve problems.	.815	-.198	
13. My organization recognizes individuals who take initiatives.	.801	-.073	
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	.790	.172	
16. My organization encourages people to be global thinkers.	.790	-.196	
11. My organization puts its knowledge and wisdom in the hands of all employees.	.784	-.103	
21. In my organization, leaders ensure that the organization's actions are consistent with its values.	.782	-.245	
20. In my organization, leaders continually look for opportunities to learn.	.777	-.157	
15. My organization supports employees when they take calculated risks.	.771	-.264	
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	.761	.262	4
17. My organization works together with the outside community to solve mutual needs.	.758	-.285	
12. My organization measures the results of the time and resources that go into training.	.753	-.195	
14. My organization enables people to control the resources they require to do their jobs.	.752	-.266	
4. In my organization, feedback is provided in an open and honest manner.	.745	.342	2
6. In my organization, people try to build trust among themselves.	.732	.284	3
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	.730	.391	1
10. My organization develops systems for measuring the difference between the current and expected performance.	.718	-.123	
7. Within my organization, teams and groups are free to change their goals as needed.	.712	.257	
2. In my organization, we provide people with time to help them learn.	.700	.253	
3. In my organization, people are recognized for their learning.	.699	.206	
1. In my organization, people work together to learn.	.694	.251	

Extraction method: Principal component analysis.

a. 2 components extracted

Source: Own elaboration with research data.

Table 9. Total rotated component matrix

Rotated Component Matrix[a]	Component	
	1	2
17. My organization works together with the outside community to solve mutual needs.	.754	.296
15. My organization supports employees when they take calculated risks.	.749	.321
21. In my organization, leaders ensure that the organization's actions are consistent with its values.	.745	.342
18. My organization encourages individuals to find answers across the organization to solve problems.	.738	.399
14. My organization enables people to control the resources they require to do their jobs.	.736	.306
19. In my organization, leaders advise and train those they lead.	.719	.422
16. My organization encourages people to be global thinkers.	.718	.383
12. My organization measures the results of the time and resources that go into training.	.690	.359
20. In my organization, leaders continually look for opportunities to learn.	.682	.404
11. My organization puts its knowledge and wisdom in the hands of all employees.	.651	.448
13. My organization recognizes individuals who take initiatives.	.644	.482
10. My organization develops systems for measuring the difference between the current and expected performance.	.616	.389
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	.281	.779
4. In my organization, feedback is provided in an open and honest manner.	.325	.753
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	.390	.704
6. In my organization, people try to build trust among themselves.	.354	.701
7. Within my organization, teams and groups are free to change their goals as needed.	.357	.668
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	.472	.657
2. In my organization, we provide people with time to help them learn.	.351	.657
1. In my organization, people work together to learn.	.347	.651
3. In my organization, people are recognized for their learning.	.382	.621
Extraction method: Principal component analysis. Rotation method: Varimax normalization with Kaiser. a. The rotation converged in 3 iterations.		

Table 10. Total factor composition

Factors	Item	Total
Organization's ability to learn	1. In my organization, people work together to learn. 2. In my organization, we provide people with time to help them learn. 3. In my organization, people are recognized for their learning. 4. In my organization, feedback is provided in an open and honest manner. 5. In my organization, every time someone expresses his opinion, he also asks what other people think about it. 6. In my organization, people try to build trust among themselves. 7. Within my organization, teams and groups are free to change their goals as needed. 8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered. 9. In my organization, teams and groups feel confident that the organization will respond to their recommendations. 10. My organization develops systems for measuring the difference between the current and expected performance. 11. My organization puts its knowledge and wisdom in the hands of all employees. 12. My organization measures the results of the time and resources that go into training. 13. My organization recognizes individuals who take initiatives. 14. My organization enables people to control the resources they require to do their jobs. 15. My organization supports employees when they take calculated risks. 16. My organization encourages people to be global thinkers. 17. My organization works together with the outside community to solve mutual needs. 18. My organization encourages individuals to find answers across the organization to solve problems. 19. In my organization, leaders advise and train those they lead. 20. In my organization, leaders continually look for opportunities to learn. 21. In my organization, leaders ensure that the organization's actions are consistent with its values.	21 Items
Dialogue and team learning	5. In my organization, every time someone expresses their opinions, they also ask what other people think about it. 4. In my organization, feedback is provided in an open and honest manner. 6. In my organization, people try to build trust among themselves. 8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	4 Items

Source: Own elaboration with research data.

Table 11. Summary of Total Data Processing

Case processing summary			
		N	%
Cases	Valid	536	89.9
	Rejected[a]	60	10.1
	Total	596	100.0
a. Elimination by list based on all variables in the procedure.			

Source: Own elaboration with research data.

Table 12. Total reliability statistic

Reliability statistics	
Cronbach's alpha	# of elements
.963	21

Source: Own elaboration with research data.

Table 13. Total statistic-total element

Total-element statistics				
	Mean of scale if the item is removed	**Scale variance if the item is removed**	**Corrected item-total correlation**	**Cronbach's alpha if item is removed**
1. In my organization, people work together to learn.	77.01	765.202	.663	.961
2. In my organization, we provide people with time to help them learn.	77.04	764.096	.670	.961
3. In my organization, people are recognized for their learning.	77.61	758.279	.668	.961
4. In my organization, feedback is provided in an open and honest manner.	77.19	760.309	.718	.961
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	77.28	757.565	.702	.961
6. In my organization, people try to build trust among themselves.	77.22	760.204	.703	.961
7. Within my organization, teams and groups are free to change their goals as needed.	77.17	758.906	.682	.961
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	77.30	755.771	.733	.961
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	77.18	752.559	.764	.960
10. My organization develops systems for measuring the difference between the current and expected performance.	77.08	758.956	.687	.961
11. My organization puts its knowledge and wisdom in the hands of all employees.	77.01	754.792	.756	.960
12. My organization measures the results of the time and resources that go into training.	77.03	757.169	.723	.961
13. My organization recognizes individuals who take initiatives.	77.30	749.637	.775	.960
14. My organization enables people to control the resources they require to do their jobs.	77.07	758.031	.721	.961
15. My organization supports employees when they take calculated risks.	77.35	754.930	.742	.961
16. My organization encourages people to be global thinkers.	77.19	751.883	.761	.960
17. My organization works together with the outside community to solve mutual needs.	77.09	756.355	.727	.961
18. My organization encourages people to find answers throughout the organization when solving problems.	77.10	751.240	.789	.960
19. In my organization, leaders advise and train those they lead.	77.08	748.628	.791	.960
20. In my organization, leaders continually look for opportunities to learn.	76.95	753.887	.748	.961
21. In my organization, leaders ensure that the organization's actions are consistent with its values.	77.03	753.838	.753	.960

Source: Own elaboration with research data.

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APPENDIX

Survey on the Dimensions of the Intelligent Organization and the Dissemination and Documentation of Tacit Knowledge

® Miguel Hernandez Ph.D.

In this survey, you are asked to think about how your business supports and uses learning at the individual, team, and organizational levels. From this data, you and your organization will be able to identify your strengths and continue to develop them as well as the areas of greatest strategic impact that will allow you to evolve towards an intelligent organization.

Please provide a response to each of the following. Determine the extent to which the practice illustrated in the statement applies to your organization. If the statement refers to a practice that happens rarely or almost never, tick one [1]. If the statement refers to a practice that almost always happens in your department or working group, indicate six (6).

There are no correct or incorrect answers. We would like to hear what you think of the current situation.

Table 14. Survey on the dimensions of the intelligent organization and the dissemination and documentation of tacit knowledge

INDIVIDUAL LEVEL	
1. In my organization, people work together to learn.	1 2 3 4 5 6
2. In my organization, we provide people with time to help them learn.	1 2 3 4 5 6
3. In my organization, people are recognized for their learning.	1 2 3 4 5 6
4. In my organization, feedback is provided in an open and honest manner.	1 2 3 4 5 6
5. In my organization, every time someone expresses his opinion, he also asks what other people think about it.	1 2 3 4 5 6
6. In my organization, people try to build trust among themselves.	1 2 3 4 5 6
TEAM OR GROUP LEVEL	
7. Within my organization, teams and groups are free to change their goals as needed.	1 2 3 4 5 6
8. In my organization, teams and groups review their thoughts as a result of group discussions or information gathered.	1 2 3 4 5 6
9. In my organization, teams and groups feel confident that the organization will respond to their recommendations.	1 2 3 4 5 6
ORGANIZATION LEVEL	
10. My organization develops systems for measuring the difference between the current and expected performance.	1 2 3 4 5 6
11. My organization puts its knowledge and wisdom in the hands of all employees.	1 2 3 4 5 6
12. My organization measures the results of the time and resources that go into training.	1 2 3 4 5 6
13. My organization recognizes individuals who take initiatives.	1 2 3 4 5 6
14. My organization enables people to control the resources they require to do their jobs.	1 2 3 4 5 6
15. My organization supports employees when they take calculated risks.	1 2 3 4 5 6
16. My organization encourages people to be global thinkers.	1 2 3 4 5 6
17. My organization works together with the outside community to solve mutual needs.	1 2 3 4 5 6
18. My organization encourages individuals to find answers across the organization to solve problems.	1 2 3 4 5 6
19. In my organization, leaders advise and train those they lead.	1 2 3 4 5 6
20. In my organization, leaders continually look for opportunities to learn.	1 2 3 4 5 6
21. In my organization, leaders make sure that the actions of the organization are in line with its values.	1 2 3 4 5 6

Table 15. Dimensions of organizations that learn

DIMENSION	ÍTEMS
CONTINUOUS LEARNING	1,2,3
RESEARCH AND DIALOGUE	4,5,6
COLLABORATION AND TEAM LEARNING	7,8,9
SYSTEMS TO CAPTURE LEARNING	10,11,12
EMPOWERMENT	13,14,15
CONNECT THE ORGANIZATION TO THE ENVIRONMENT	16,17,18
STRATEGIC LEADERSHIP FOR LEARNING	19,20,21

Chapter 9
Scenario Planning as a Tool to Manage Crises in Chaotic and Uncertain Environments: The Case of the COVID-19 Pandemic

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ABSTRACT

This chapter will describe scenario planning and establish its value in facing crises and chaotic situations. It explains how research in the field has evolved and describes context conditions such as uncertainty, crisis, and chaos, which provide fertile grounds for scenario planning. A bibliometric analysis is presented to illustrate the increase in the study of scenario planning as a tool to deal with uncertainty. Examples from scenario planning around the world are introduced to show its global application and potential. A comparative analysis is presented based on different exercises in scenario planning developed during the COVID-19 pandemic to provide an insight into the key uncertainties linked to the health crisis and how a broad perspective can help provide clarity in chaotic environments.

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INTRODUCTION

Modern times have been declared as postnormal times (Sardar, 2010). The pandemic has been a shock beyond volatility, uncertainty, complexity, and ambiguity. This is a period of transformation, an in-between phase where old ideas are dying and new ones are yet to be developed; therefore, sensemaking becomes difficult (Sardar & Sweeney, 2016). In business and management and other disciplines, the study of uncertainty becomes relevant as it is the inherent state of nature, pervading organizational life in a permanent form. This chaotic context calls for different planning strategies that incorporate the unknowns and the unknowables.

Uncertainty is an inevitable part of growth and development. In permanent evolution, uncertainty presents itself as a series of challenges that need to be continuously addressed. The same social structures cannot withstand the growing forces of change, and some are disappearing. It is a constant succession of new beginnings, transformations, and reconstructions. Life has become a series of relatively connected phases in which certainties have become blurred, more fragile, and less reliable.

Times are changing in unprecedented ways, and they are becoming more fragile and less trustworthy, uncovering a reality in which previous social structures are no longer valid. The age of uncertainty (Ágh, 2015) has been declared as a contrast between the certainty of economic and social ideas (Russel, 2018) that prevailed in the XIX century, the beginning of the XXI century.

The increased speed of developments makes it practically impossible to determine what the future might hold; every event and circumstance that the world faces has a heavy uncertainty load. Under these conditions, people want the world to make sense, be predictable, and follow clear cause-and-effect rules. However, the future is not foreseeable; globalization and technology are sweeping away market structures that have historically defined business and the nature of competition, making it impossible to predict, with any confidence, what the future will bring. The new millennium and especially the COVID-19 pandemic have brought about the most profoundly uncertain business environment ever faced.

Understanding uncertainty is critical in the current business environment. Different theories have explained the notion in response to the times we are living in. The best-known conceptualization is that of the VUCA times. The acronym refers to times that are volatile, uncertain, complex, and ambiguous. The VUCA times were initially conceived by the American militia to describe the new world order after the Cold War (Foresight, Kuhla & Rice, 2018), becoming a guideline for understanding a changing global world.

Modern times have also been described as exponential, turbulent, liquid explosive, chaotic, tumultuous, prone to seismic change, and postnormal (Sardar, 2010). We are living in an era that has been referred to as a new reality that is destructive, impulsive, and unpredictable, one in which ubiquitous, continuous, and dynamic changes are all-pervasive in organizations.

The influence of these conditions is visible in all aspects of business, including knowledge management and networks, strategy and decision-making, lean enterprises and agility, exploration and innovation, institutional complexity, leadership development, leadership resilience, employee involvement, and participation.

The COVID-19 Pandemic has created a particular situation in which uncertainty prevails. Still, uncertainty is one of the most crucial business environment conditions, and businesses have to adapt by using different tools to manage chaos. In times of crisis, trying to predict a single outcome is a recipe for disaster because when everything is uncertain, there is a need to plan for multiple outcomes. Additionally, after a crisis, some things will return to normal, while others will not (Seewald, 2020).

Scenarios have been used as a crisis planning activity (Pollard & Hotho, 2006) and to train and develop crisis managers (Moats, Chermack & Dooley, 2008) because they help organizations deal with uncertain environments by creating different alternatives of possible futures (Adamus & Markiewicz, 2013). Scenario planning can outplay chaos (Malherbe, 2020). The intended outcome of scenario planning includes individual and team learning, integrated decision-making, and understanding how the organization's goals are achieved amid chaos (Chermack, 2004), creating a map of potential alternative future settings in which strategic decisions need to be made (Schwartz, 1991).

Simply defined, a scenario is a description of a possible or probable future. It defines a set of future events or circumstances that would affect the organization's performance (Bloom & Menefee, 1994). The history of scenario planning can be traced back to military planning and war games (Roxburgh, 2009). In the 19th century, strategic planning principles were first formulated, later evolving into scenario techniques and simulations that have been employed by military strategists throughout history (Bradfield, Wright, Burt, Cairns, and Van der Heijden, 2005).

In times of war, soldiers prepared for battle by reenacting future situations they could encounter (Van der Duin, 2016). These methods became more popular during the Second World War and later started to be used by Rand Corporation in the 1950s and '60s to explore the context in which a nuclear war might erupt between the Soviet Union and the United States of America (Verity, 2003).

During the 1960s and '70s, the methodology derived from future thinking in conflict situations was adapted to be used in industrial settings. General Electric and Royal Dutch Shell are some of the most remarkable examples of the transition of scenario planning into the industry and business world, being Shell one of the pioneers of this methodology (Roxburgh, 2009). Thinking ahead and planning for multiple possible outcomes quickly became a way for companies worldwide to further their ambitions by developing new and better processes and original products to fulfill future demands, visualized through the use of alternative scenarios.

BACKGROUND

Research in the Field of Scenario Planning

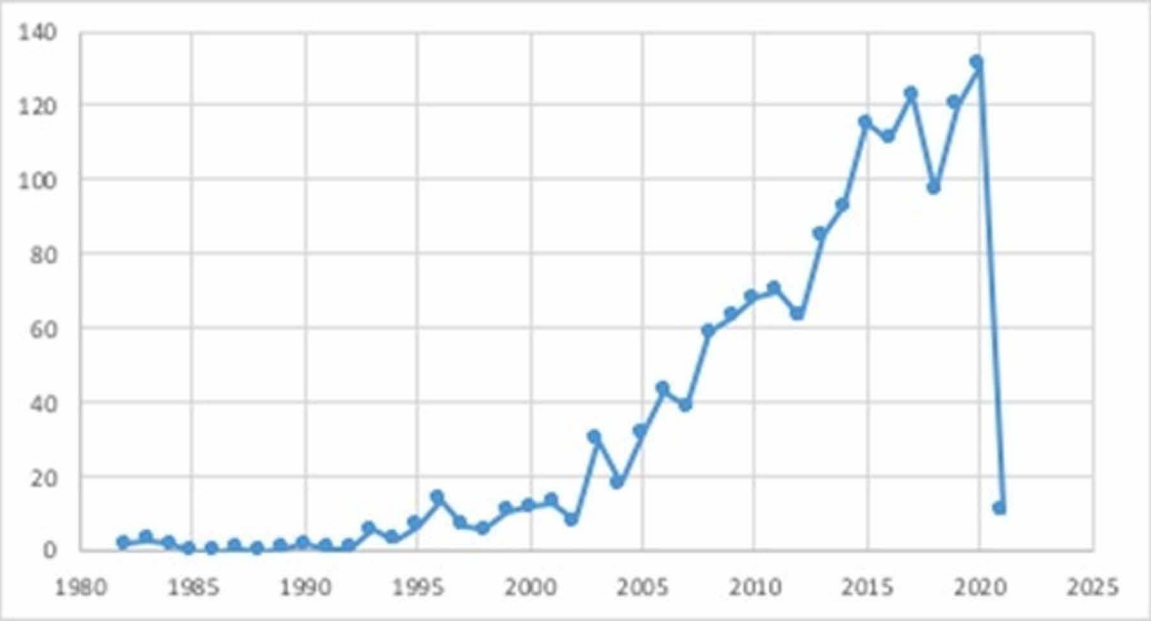
A bibliometric review on the Web of Science on March 20th, 2021, revealed 1470 publications dealing with scenario planning since 1982. Figure 1 shows the evolution of published articles in the field.

As can be observed in Figure 1, there has been a substantial increase in the number of articles in the past few years, being 2020 the year with the most significant number of publications available in the Web of Science, which was 131. It is important to state that the analysis only includes the first three months of 2021, which is why the graph shows a considerable decrease.

In order of importance, the ten countries with the largest number of publications are the United States, England, Australia, Germany, Scotland, Canada, China, The Netherlands, Iran, and South Africa. Most of the published works have been developed by scholars from The University of Strathclyde, Colorado State University, The University of London, The University of Oxford, and the University of Queensland.

Additionally, different public organizations have contributed to the development of research in the field, including the United States Department of the Interior and the Commonwealth Scientific Industrial Research Organization from Australia. Businesses and consulting companies worldwide have helped

Figure 1. Published articles in the field of scenario planning



generate knowledge and research on the field through the publication of whitepapers and reports, although these types of publications have not been included in the Web of Science.

Most published works are based on regional and urban planning and transport, business and management, environmental studies/ecology, economics, operations research, engineering, and most recently, health and the COVID-19 pandemic.

Chaotic and Uncertain Environments

In businesses, the notion and the theory of chaos were introduced by Lorenz (1963), with the idea of the butterfly effect, and by Li and Yorke (1975), who explained the unpredictable behavior of non-linear deterministic systems in which small initial changes could lead to significant changes over time. Researchers in organizational change and development became interested in how chaos explained the way in which organizations changed and how they could be changed, using concepts such as self-organization, emergence, and complexity (Prigogine & Stengers, 1984).

The notion of chaos has been used to explore the requirements for strategizing in a rapidly changing business environment (Bechtold, 1997). In the 1980s, chaos theory began to be introduced in multiple disciplines, providing an opportunity to examine problematic behaviors that previously eluded explanation (Jayanthi & Sinha, 1991).

Chaos can be analyzed both from a positive and a negative perspective. The negative side of chaos is the emergence of total disorder that generates confusion and panic, while the positive is starting from an unorganized state to create order (Odiorne, 1991). It occurs when there is no time to follow the rules, when no rules are established (Rubin, 2018), and when people are managing too many tasks.

Chaos produces multiple problems, especially the loss of strategic focus (Byrnes, 2018). Organizations end up missing opportunities to predict and mobilize for change, and in the end, they react to it.

Still, chaos is necessary to new creative ordering because one of the underlying principles in chaos is the notion that there is order that emerges from it and that everything is interrelated (Wheatley, 2006). In organizations, chaos is prevalent, but rather than avoiding the inevitable, they should focus on managing it.

Chaotic systems tend to be deterministic systems that evolve through a phase of instability and eventually move on to another threshold where a new relationship is established between its internal and external environments and itself (Lorenz, 1963). An interesting aspect of chaos is that it can breed order (Itkin & Nagy, 2014). Chaos is critical to the process of adaptation and evolution (Schneider & Somers, 2006). In this sense, chaos theory offers multiple alternatives and perspectives from which to analyze the COVID-19 pandemic in order to work with essential variables and uncertainties that are frequently missing in traditional planning.

Scenario Planning: All About the Future

The use of scenarios helps analyze different possibilities while coping with uncertainty and unpredictability (Ringland & Schwartz, 1998). Creating and preparing for future scenarios allows managing chaotic situations before they have begun by considering circumstances that could define the success or failure of an organization. Scenario planning is a way of thinking about the future to find innovative ways to overcome the obstacles or seize the opportunities that lie ahead. Scenarios are formulated according to what we know about how the present conditions emerge, and there are emerging and growing trends that make it difficult to anticipate with certainty what the future will be like. The process comprises four steps: identifying the driving forces, determining the key uncertainties, identifying the characteristics for the selected uncertainties to develop plausible scenarios, and discuss the implications and the different paths (Brummell & MacGillivray, 2016) or the alternative stories.

According to Sardar & Sweeney (2016), the future is integrated by:

1. Surface uncertainty of an extended present that has been largely conquered.
2. Shallow uncertainty of familiar futures, which are mediated by existing images of the future.
3. Deep uncertainty of the unthought futures.

From this perspective, it is safe to say that there are numerous unthought futures, which are future possibilities that have not been considered because they are outside our beliefs and general worldview (Sardar, Serra & Jordan, 2019). In this context, different metaphors have been used to explain the uncertainty about the future. Black swans, jellyfish, elephants, and rhinos have been dubbed as mascots of postnormal, unexpected, and even predictable yet surprising times (Sweeney, 2014).

The metaphor of the "black swan" (Taleb, 2007) describes a situation that has two distinct qualities. First, it is not even considered as a possibility before it occurs, and secondly, it has a considerable impact. The impact can be assessed on different terms, be it economic, political, social, environmental, financial, or structural, among others. Events that can be classified as "back swans" considering the previously mentioned qualities are quite likely in a world where randomness and constant changes prevail (Runde, 2009).

For its part, the term "black elephant" describes an imminent disaster that is clearly foreseeable considering past and present conditions; however, no one seems to want to address it before it is too late (Burchman & Jones, 2020). The idea comes from merging "black swan" events and the metaphor of the "elephant in the room". Crisis such as the COVID-pandemic could fall into this category, as experts

worldwide had warned against health threats such as this novel virus, yet most governments, companies, and people were unprepared when the situation finally presented itself.

Following that line of thought, "black jellyfish" are similar to "black swans" and "black elephants" in the sense that they too have a significant impact on the environment they affect. These types of events represent the postnormal potentiality of the unthought future or futures (Sardar & Sweeny, 2015). This reference aims to emphasize that small things can have an impact on a greater scale than could be expected, comparing real-life emerging issues with jellyfish blooms and their effects on ecosystems.

Lastly, another type of disaster has been denominated the "gray rhino" to illustrate events that represent an obvious danger and that are also highly probable (Ferguson, 2020). These situations could include financial crises, environmental-related problems like climate change, and the omnipresence of technology. They are perceptible at the moment people stop asking the question "what if this happens?" and start substituting it with "when this happens". The term "gray rhino" could be connected to the idea of "black elephants" because both relate to events that have some level of certainty in terms of their impending existence.

In the face of the alternative conceptualizations about the foreseeable and unforeseeable futures, scenario planning emerges as a way to include a series of possibilities that allows gaining some insight into the wide range of opportunities, challenges, and threats that have not yet come to be. Scenario planning, as a future craft (Ratti & Claudel, 2016) -imagining futures (Godet, 2001) or snapshots of the future- (Datour, 1996), can provide a better understanding of change and clarity drivers in chaotic situations (Toffler Associates, 2020).

Scenarios have been used across the globe in all types of businesses and sectors. Examples can be found in the oil and energy field, airlines and the aerospace industry, public policy, pharmacy, problems such as climate change, and most recently, to understand what lies ahead in terms of the COVID-19 pandemic.

Scenario planning is an emergent process and valuable in itself. Creating scenarios can help make sense of momentous changes and challenge our assumptions about the future (Social Finance, 2020). The scenario planning methodology does not go without criticism, especially by those who consider it a methodological chaos, suggesting that there is not enough theoretical foundation to support it (Spaniol & Rowland, 2018).

MAIN FOCUS OF THE CHAPTER

The main focus of this chapter is to show the importance that scenario planning plays when facing crises in uncertain and chaotic environments. The COVID-19 world crisis was selected to exemplify different ways in which scenarios can be used to create alternative futures. In just a year, businesses, ONG's, and governments used scenario planning to create alternatives of how the future would look like, and more specifically, to find alternatives in the midst of chaos. The way in which scenarios were constructed, the forces, trends, and characteristics considered are described to provide a wide view of the possibilities of its use.

METHOD

This chapter presents a literature review and introduces a series of different scenario planning exercises regarding the COVID-19 pandemic that have been developed across the globe in different organizations, government agencies, NGOs, and consulting firms. The examples are briefly described and are later analyzed to identify common threads.

SELECTED EXAMPLES

Examples from different sectors have been selected to illustrate some of the main trends surrounding scenario planning in the context of a global pandemic. Some examples provide different alternatives in times of the health crisis, while others analyze the possibilities in a post-pandemic world.

Faced with the COVID-19 pandemic, the question about how local authorities can adapt to meet the emerging needs of communities increases in importance. Social Finance developed four scenarios based on two main uncertainties for local governments in the UK. First, the model considers responsibility in terms of who will drive the crisis response and whether it will be a centralized decision or localities will have the power to decide. The second uncertainty was transformation, and it referred to how much the councils could use the crisis to either transform their operating models or return rapidly to more traditional models (Social Finance, 2020). Table 1 presents the scenarios developed in April 2020.

Table 1. Local government futures

Scenario	Description
Innovation against the odds	Large central programs and services for post-COVID needs are launched. Central government drives major programs for social and economic recovery. There is an agile delivery of local transformation. Governments act in coordination for combined local rescues.
Civic renewal	Quicker and simpler changes are prioritized. Local authorities learn from the crisis, and responses create new ways of working, engaging residents in decision making and creating partnerships with health services, businesses, and communities.
Race back to normal	The main focus is on getting services up and running again, which leads to a return to previous systems, which are made as effective as possible. In the new context, governments and businesses lack the drive to change.
Central command and control	Central initiatives take precedence. National and economic programs are announced, and councils look for ways to switch back services that were repurposed during lockdown. There will be a return to the offices in smaller numbers.

Schwartz (2020a) designed three scenarios for the COVID-19 pandemic based on the likelihood of a vaccine and how people would react to the situations that might emerge in specific contexts. This model presents uncertainties in terms of vaccine availability and nature (science), whether people would take the vaccine, who develops the vaccine and under what terms they make it available, who will get access to it, and on what terms. Table 2 summarizes said scenarios in which the accelerating trends are based on remote everything, de-globalization, digital transformation, and sustainability.

Table 2. COVID-19 vaccine scenarios

Scenario	Description
Zero hurdles	Best case scenario, no problems arise, the vaccine is made available, and people take it.
Sprint and stumble	Vaccines are made quickly; however, people do not necessarily trust them.
Long march	Science takes too long. By the time the vaccines are developed, people will trust them, but there is limited access due to political issues and control over vaccines.

Table 3. COVID-19 scenarios

Scenario	Description
Optimistic	This scenario assumes that most things work as they should. People maintain social distancing rules and that the virus will be contained, if not eliminated, for at least a few months. Immunity persists, and economic policies become efficient. The "new normal" begins as vaccination allows the economy to return to its previous growth path.
Intermediate	In this scenario, the virus persists with a second and third wave and requires continuous confinement conditions. The economic recession hits harder, but then the vaccine slowly allows the reopening of businesses and paves the way for the new normality.
Pessimistic	This scenario contemplates that the virus resurges with additional force during the second wave, becoming even worse. Prolonged confinement results in an intense and long economic recession with a profound social impact. Without vaccines being available for all, the "COVID-19 normal" will be sustained with continuous waves of the virus, persistent economic uncertainty, and social unrest.

Schwartz (2020b) also developed the scenarios regarding the social response to the confinement conditions and the repercussions of the different measures implemented to contain the virus. Table 3 summarizes said scenarios.

Considering the critical uncertainty that is the longevity of the virus, at the beginning of the pandemic Michael Osterholm of the University of Minnesota developed three potential scenarios for future outbreaks (GAVI Vaccine Alliance, 2020), which are described in Table 4.

Table 4. The future of the COVID-19 pandemic

Scenario	Description
Scenario 1	Mini-waves of smaller outbreaks occur every few months, with periods of only a few cases in between. The location of the outbreaks depends on the regional variations regarding the mitigation measures that are in place.
Scenario 2	The current outbreak is followed by a massive second wave that is twice as large and long-lasting. This significantly affects the health systems in numerous countries.
Scenario 3	There are continued COVID-19 outbreaks until the end of 2022. The virus mutates, resulting in less immunity and difficulties in developing a viable vaccine.

Now we know that there is even a third wave already hitting certain countries and that there are different variants of the virus emerging around the world.

Among some other scenario planning exercises, in 2020, Deloitte also established four possible alternatives for how businesses and societies could progress over the next three to five years, considering the

pandemic's potential long-term implications on an international scale (Deloitte, 2020). Such scenarios are presented in Table 5.

Table 5. The world remade by COVID-19

Scenario	Description
The passing storm	The COVID pandemic affects societies as a whole, but slowly there is a response from the political and health systems. This promotes coordinated measures that allow the eradication of the virus earlier than predicted. However, global awareness prevails, there are long-term economic impacts, and tensions emerge between different socio-economic classes.
Good company	The pandemic persists beyond initial projections, creating a prolonged global crisis. Alliances and partnerships are developed to respond to critical needs. The digitalization of the economy fully expands, and companies connected to technology gain new prestige.
Sunrise in the east	The pandemic is severe. China and other Asian countries manage the disease more effectively than other regions. Global power shifts to the east because of their ability to contain the outbreak.
Lone wolves	The pandemic creates a prolonged health and economic crisis with continuous waves. Paranoia grows as death rates rise continuously. Economies close their doors to foreigners and concentrate on local supply chains. Countries isolate themselves to promote domestic safety and establish strong controls and restrictions on their citizens.

In the first months of the pandemic, Nick Turner created a scenario framework to review plausible futures that would help the world prepare for the potential impact of COVID-19 on areas like the global economy, geopolitics, and society. The scenarios presented in Table 6 were built on two critical uncertainties: the nature of global coordination, which could be "slow and inadequate" or "fast and efficient"; and the nature of the public response, which could be "ill-disciplined" or "disciplined" (Turner, 2020).

Table 6. Scenarios to think the unthinkable and prepare for the uncertain

Scenario	Description
Dejá flu	Governments share information and scarce resources. There is an information overload in the media. Consensus and patience weaken. There is a strong business lobby to restore the economy. Second wave hits.
Keep calm and test on	Effective quarantine measures and testing reduces negative impacts. The public follows expert advice and becomes disciplined. Technology for tracking, monitoring, and data analysis prevails. Media reporting is informed yet restrained. Governments and banks work together to find solutions.
Me first	Authorities struggle to contain the outbreak. There is a lack of international collaboration. People make selfish decisions. The global economy slows down. There is a blame game in domestic and international politics.
Riding the rapids	There is a weak and patchy policy response to outbreaks; certain demographics are hit disproportionately. Leaders do not respond effectively. Disparities arise. Second and third waves hit.

Deloitte proposed a series of scenarios for leaders to explore potential future states surrounding the pandemic. These scenarios are set in the year 2021, and they include a range of possible economic circumstances considering the COVID-19 crisis. They are short-term scenarios, as they have a time frame of one year and are based on two critical uncertainties: the government's response to the pandemic and its economic consequences considering vaccine distribution levels (Deloitte, 2021). Table 7 briefly describes the four scenarios designed by the professional services company.

Table 7. 2021 scenarios

Scenario	Description
Sun showers	Inadequate and uneven vaccine distribution and weak/mixed vaccine acceptance make the disease spread faster than the human response. Nevertheless, there is a more effective government response. Strong health mandates and policies to support businesses and workers help the United States maintain economic activity. The European Union renews its commitment to mutual support to get through the pandemic, and global trade is rekindled.
Endless winter	There is poor and uneven vaccine distribution and weak/mixed vaccine acceptance, which means that not enough people receive them and herd immunity is not achieved. Restrictions linger as new mutations of the virus emerge, and there is a less effective government response. The hospitality industry is hit the hardest.
Hard rain	Vaccination programs accelerate, mainly in the advanced economies. However, many people and small and medium businesses face issues of bankruptcy and debt. Although there are groups that benefit from the pandemic, there is growing dissatisfaction with politics, as government responses are not very effective.
A new dawn	There is a more effective government response, allowing businesses and employment rates to remain stable. Vaccines are quickly rolled-out in countries around the world. Despite some people being cautious of the vaccines, herd immunity is reached in wealthy countries, and emerging countries are making progress. Investment is promoted, and consumer spending grows. Travel becomes common again, although with specific protocols.

It has become clear that scenarios can be as broad or specific as required. In this sense, Van der Elst & Johnson (2020) aim to promote business resiliency through scenario planning, particularly in terms of physical and virtual software development businesses. The result of their efforts is presented in Table 8 in the form of four scenarios.

Table 8. 2021 Scenarios for a software development business

Scenario	Description
Good neighbors	This scenario is based on the idea that it is "better to have a close friendly neighbor than a distant close friend". Pandemic-induced asynchronous regulatory frameworks make cross-border business more difficult. It is easier to do business with local counterparts. In the absence of legal and regulatory frameworks to support cross-border trade and arbitration, there is an inverse relationship between trust and distance. Local businesses coalesce into imperfect alliances.
Virtual growth	It comes from the phrase "we are all in this together". The pandemic has been an accelerator for business conducted virtually. Business relationships are formed and strengthened virtually. Physical distance is irrelevant. Trust in credit, viability, supply, and continuity remain high as frameworks of communication and transparency. Business mode synchronization can compete or win against local networks.
Virtual partnerships	The precept that better describes this scenario is "only doing business with close friends". Due to supply chain uncertainty and liquidity/solvency concerns, trust in business partners is diminished. Partnerships are based on proximity, familiarity, and regulatory synchronization; as international or state borders are obstacles to free flows of goods and people, business transactions and services are impaired. Verification of credit supply, business model viability, and drive the formation of local chains.
Local chains	It derives from the idea of "online communities". Supply uncertainty generates concerns about business continuity, regardless of proximity. Competing clusters of business chains and networks operate according to common principles. Partners work with a newly accelerated virtual ecosystem, where alignment to operating principles and the diminished need for physical proximity drive business development.

Considering the potential social, technological, economic, environmental and health, political, and competitive industry forces shaping the future of human capital after the pandemic, Heidrick & Struggles developed four scenarios to depict how different uncertainties will merge to create a diverse set of possible futures (Barnakova, Snyder & Skoritowski,2020). Two high-impact uncertainties are considered:

economic rebound and social trust. The scenarios presented in Table 9 aim to show what the future of human capital in the year 2023 might be.

Table 9. COVID-19 and the future of work

Scenario	Description
Digital enclaves	The virus is mostly controlled, which allows the economy to bounce back; however, it is still somewhat unpredictable as different regions and industries recover inconsistently. There is less reliance on face-to-face business, which leads to growth in virtual selling tools. There is pressure on employers to invest more in employee health and safety. Knowledge-based workers and gig workers demand job security. Countries limit the international flow of goods and people, leading to the regionalization of operations.
Tech powered humanity	The virus is effectively controlled, and the economy flourishes. People require physical interaction to balance out the amount of virtual work during the crisis. Digital and innovation skills and talent are necessary to keep up with a fast-growing globalized market. Automation and artificial intelligence are on the rise. Higher pay and better benefits emerge as a consequence of companies upskilling their workers.
Growing divide	Governments can eventually control the virus, but a prolonged recession leads to high levels of unemployment. The Isolation measures result in a severe mental health crisis. Organizations adopt tracking solutions to monitor employees. The digital divide in the workforce grows substantially. There is a general slowdown in automation efforts. Some industries go under, while new ones arise from the trend of digitalization.
In this together	Social distancing and other measures last for a year, resulting in enormous economic damage and a deep recession. Communities join forces to overcome the crisis, communitarianism, volunteerism, and the role of nongovernmental organizations increase. When restrictions are finally reduced, social interaction becomes highly valued. Governments push laws to protect jobs, including those in the gig economy. Digital skills flourish, and automation becomes complementary instead of taking over.

Table 10. Technology in Covid-19 and racism pandemic scenarios

Scenario	Description
The clean regime	Effective testing and educational communication on COVID-19 lead to a cultural zeitgeist where cleaning becomes ritualized. Policies that encourage healthy habits are embraced, including corporate policies like paid sick leave and increased remote work to prevent further spread of illnesses. There is an increase in the investment in augmented reality tools, and retailers implement technologies to help customers get information on products without having to touch them. Customers can use their smartphones and augmented reality mannequins to see how different outfits would look on.
The showroom is your room	There is a lack of COVID-19 prevention measures that leads to a lack of traffic in retail spaces due to fear of contagion. Home shopping experiences become essential. Companies invest in augmented reality tools that resemble a more traditional shopping experience. These technologies help customers envision the products that they cannot see or touch in person.
Rise of HSA	The pandemic is finally controlled but at a great cost. The creation of the Health Security Agency (HSA) is the start of an era of authoritarian technology use under the premise of pandemic protection. Citizens are submitted to facial recognition scans and apps for contact tracing when entering public places like shopping centers. The system leads to negative experiences for women and ethnic minorities due to a lack of calibration for their specific facial features, leading to discriminatory outcomes and false readings. This can generate issues such as lawsuits.
Blinding Bias in Tech	Facial recognition technology allows unprecedented personalization for the in-store customer experience. There is a reduction in store traffic due to the ongoing pandemic, and it allows for more personal care of customers who do venture into retail stores. There is a shortfall in product sales, and to make up for it, retailers start selling customer information based on facial recognition data. Some limitations in technology produce instances of mistaken identity for darker-skinned clients. All of this generates distrust in big tech.

Table 11. The world in 2025

Scenario	Characteristics
Winners and losers	A new world order emerges. Some countries succeeded in controlling the virus, while others failed. The crisis has exacerbated the fault lines in countries with weak governance. Capitalism and democracy have lost their sheen. China is the biggest winner, using AI to contain outbreaks. In countries such as the US, racial and political unrest continue. Essential workers face an ongoing health crisis. Intergenerational tensions about health, the economy, and climate change escalate.
Community safety nets	COVID-19 is still a threat, and society has had to adapt. Progress has been made to contain the virus, but it has been challenging to sustain it. Communities, businesses, and individuals may have to adapt to heightened risks in creative ways. There has been a transformation of cities toward outdoor living. Working hours and locations have become more flexible. Affordable broadband is made available everywhere. Online learning and medicine are widespread. People started to interact in smaller circles. Many events and gatherings have fallen out of favor. There is greater awareness of inequalities in younger leaders in politics.
Build back better	The COVID-19 pandemic was an inflection point. International collaboration on vaccine development and distribution has continued. Social safety nets have been strengthened. Governments are focused on income equality and wellbeing. Automation has accelerated and reinvigorated progress on global challenges such as climate change, biodiversity loss, and health. Investments are made in supply chain resilience. In strategic segments, the value chain has been restored to offer countries a spirit of global solidarity. There is great hope for the future.

Cognizant raises the issue of health-related pandemics and racism as a pandemic, merging the two uncertainties in a scenario planning exercise. For the issue of COVID-19, the model considers whether or not adequate safeguards and precautions are implemented to prevent future health crises or reduce their impact. The topic of racism is addressed from a technological standpoint amid concerns of racial profiling through facial recognition technology. The model considers "four plausible futures for a retail company deciding whether or not to use facial recognition technology in the age of COVID-19" (Dickerson, 2020), as depicted in Table 10.

For its part, the company Business for Social Responsibility structured three scenarios that revolve around two critical uncertainties: the level of success in containing the virus and the socio-economic policy response. The control over the pandemic will define the toll the situation has on human life and how the economy will be reshaped. In terms of the policy response to the health crisis, these scenarios consider the opportunity to reimagine the social contract and reorder economic priorities and the potential of furthering inequality (Business for Social Responsibility, 2020). Table 11 presents the main characteristics of this scenario planning exercise.

Table 12. The world after the pandemic scenarios

Scenario	Description
A new renaissance	The economy has recovered and even improved. The world experiences a new version of the Roaring '20s, and society has higher levels of cohesion and less inequality.
Haves and have nots	The economy has bounced back, but the recovery accentuates some of the existing inequalities and creates further fragmentation and social tension. For the rich, this is a world of gated communities; for the poor, it is characterized by civil unrest.
Back to the 1930s	The economy does not recover, giving way to a long depression. Inequality rises, the economic crisis fuels the fragmentation of society, extremist movements emerge, and society approaches the breaking point.
A smaller but tastier pie	The economy does not recover, but the "smaller pie" is more equitably distributed. Society learns to exercise solidarity, and a new spirit of cohesion emerges. People are poorer but seem to be happier.

As scenario planning can be used in any type of political, economic, and social organization, the Jewish Funders Network also embarked on a scenario design process to envision how the United States and the world will look in a time-frame of two years (JFN, 2020). They set out to imagine alternative futures where there would be an impact on the Jewish community and how it operates, considering two main variables: the strength of economic indicators and the level of cohesion and equality in society. These scenarios are presented in Table 12.

In the African continent, Global Compact Network South Africa developed a post-pandemic landscape, considering socio-political and economic contexts, considering that even as the world starts to recover from the health crisis, much uncertainty remains (Global Compact Network South Africa, 2020). These scenarios aim to approximate what the future will look like for businesses and what they need to plan for. As presented in Table 13, the scenarios integrate economic and socio-political conditions as drivers of risk aligned with the Sustainable Development Goals.

Table 13. Global compact network South Africa: Scenario planning beyond the COVID-19 pandemic

Scenario	Description	Sustainable Development Goals
Planting for some	The local economic landscape has been protected at the cost of wider inequalities. This has resulted in a conflicted socio-political landscape.	4 Quality education 8 Decent work and economic growth 10 Reduced inequalities
A harvest for all	Steady and innovative pathways toward a sustainable future for the people and the environment, supported by a thriving economy.	9 Industry innovation and infrastructure 13 Climate action 17 Partnering for the goals
Drought and desolation	Critical fight to protect the economic and political landscape, as well as safeguarding people from negative consequences.	1 No poverty 8 decent work and economic growth 16 Peace justice and strong institutions
Lying fallow with weeds	People are united, but economic prosperity is compromised. There is an inability to finance the future potential.	3 Good health and wellbeing 16 Peace, justice, and strong institutions 17 Partnering for the goals

Table 14. IMD 2020 Post Covid World

Scenario	Description
Global marketplace	The virus is present in the short term; there is global acceptance of the problem and digital acceleration. No deeper economic, political, or social problems take root. Everyone wants to get back to business.
Digital reset	Unilateral responses to the crisis seem to be failing, so a collaborative effort is undertaken to reduce the spread of the virus. Slowly, progress is made and people start to travel. Due to the effects of misinformation during the pandemic, many people begin to limit their exposure to digital media.
Back to basics	COVID-19 infections and deaths fail to slow down. People become distrustful about threats and products from the outside. They choose to travel close to home, and global supply chains are dismantled. Digital technologies become too invasive for many people.
Walled gardens	The virus dissipates quickly. Lingering suspicions remain about the dangers of pandemics from foreign lands. Nations prioritize themselves over the global collective good. Local trips and events become more popular. Technology remains pervasive, but people become less interested in global themes.

Table 15. The COVID-19 pandemic: Scenarios to understand the international impact

Scenarios	Description
Silver linings	In 2025, geopolitics is characterized by cooperation and the reduction of domestic governance issues. There is a decline in armed conflict inside and in between countries. Although the pandemic transformed key aspects of globalization, the basic elements remained intact. The Global economy recovered.
Downfall	Economic recovery remains slow, and pre-existing commercial and state relations are fragmented. Wars between the world's great powers become more probable. There are local governance problems, and geopolitics are characterized by conflict.
Lost in transition	There is a growing sense of instability. The geopolitical context is impaired by conflict; however, local governance structures are not particularly challenged. Economic recovery is slow, and there is an international bifurcation of economic activity where China and the United States represent opposite sides. New military alliances emerge.
Home alone	Economic recovery is highly uneven. International rivalries intensify, cooperation fails, and humanitarian missions are derailed. The European Union becomes a more confident geopolitical actor. There is a disruption of globalization due to tendencies of more local supply chains. Armed conflict due to state fragility increases.

Michael Wade from the Institute for Management Development created a scenario model based on factors such as virus longevity, global mindset, and digital adoption. The forces analyzed were the global environment, the business landscape, market regulations, innovation trends, and consumer engagement (Wade, 2020). Four scenarios were developed as a result, which are presented in Table 14.

The International Institute for Strategic Studies designed four scenarios to identify the impact of the COVID-19 pandemic on the global political, economic and military balance of power. In terms of politics, the model considers governance and geopolitics; the economic factors are reordering and recovery, and the military elements analyzed are armed conflict and military posture (IISS, 2020). The scenarios' objective is to systematically explore the possibilities that arise from the areas that are considered in a five-year time frame. The description of these scenarios is presented in Table 15.

According to the World Energy Council (2020), the global energy sector is one of the most severely affected by the COVID-19 crisis, and this is having significant and uneven impacts across all societies and economies worldwide. Considering that overcoming the crisis and managing a global energy transi-

Table 16. COVID-19 crisis scenarios

Scenario	Description
Pause	After the imposed "pause" due to lockdowns and other measures, society starts to collaborate to return to pre-pandemic normalcy. The vaccine allows the containment of the virus by 2022. Renewable energies will be competitive again after a long recovery. Debt and uncertainty make it hard to finance new projects. The progress in mitigating climate change is slower than expected.
Rewind	There is a turn away from globalization where local economies are revived. Vaccine development is slow, and not all countries can handle the virus well nor manage the loss of economic activity. Supply chains become vulnerable as there is a growing protectionist movement. Trade becomes more bilateral, there is a domestic focus, which widens the gap between rich and developing countries.
Fast forward	Scientific collaboration to tackle COVID-19 is successful, and there is high-scale vaccine manufacturing. Big data and combined resources invigorate the economy. China is on the rise, paving the way for a new world order. Renewable energies become more competitive, and collaboration is the basis for climate change policies.
Re-record	Vaccines and treatments proliferate in a confusing and non-coordinated fashion. There are different outcomes worldwide. Slow economic recovery is followed by social unrest, and essential workers demand equality. Financial investments begin to migrate to renewable energies and circular economies.

Table 17. COVID-19 scenarios analysis

Author	Number	Names of the scenarios	Critical uncertainties/Key factors	Focus/ vision
Social Finance (2020)	4	Innovation against the odds, Civic renewal, Race back to normal and Central command and control.	Responsibility and transformation.	**During the pandemic.** The role of the central and local governments in response to the virus.
Schwartz (2020)	3	Zero hurdles, Sprint and stumble, and Long march.	When the vaccine gets developed, who develops it, under what terms they make it available, whether people would take the vaccine, who will get access to it, and on what terms.	**During the pandemic.** When vaccines are ready and available and the social response to them.
Schwartz (2020)	3	Optimistic, Intermediate, and Pessimistic.	The response to the prevention measures and their social and economic repercussions.	**During the pandemic.** "Social obedience".
Osterholm, GAVI Vaccine alliance (2020)	3	1, 2, and 3.	Longevity of the virus, new waves, virus mutation.	**During the pandemic.** Potential pandemic phases.
Deloitte 2020	4	The passing storm, Good company, Sunrise in the east, and Lone wolves.	Duration of the pandemic and the corresponding consequences.	**During the pandemic.** Potential long-term implications of the pandemic on an international scale.
Turner 2020	4	Déja flu, Keep calm and test on, Me first, and Riding the rapids.	Global coordination: fast and efficient vs. slow and inadequate. Public response: Panicked Vs. Disciplined.	**During the pandemic.** Level of control over the pandemic and its social and economic consequences.
Deloitte 2021	4	Sun showers, Endless winters, Hard rain, and A new dawn.	Effectiveness of government response Vaccine distribution and adoption.	**The beginning of the end of the pandemic.** Economic consequences considering the levels of vaccine distribution.
Van der Elst & Johnson (2020)	4	Good neighbors, Virtual growth, Virtual partnerships, and Local chains.	Virtual engagement and collaboration Trust in business partners.	**The beginning of the end of the pandemic.** Physical and virtual software development businesses.
Barnakova, Snyder & Skoritowski from Heidrick & Struggles (2020)	4	Digital enclaves, Tech powered humanity, Growing divide, and In this together.	Social trust: low or high. Economy: rebound or prolonged recession.	**The beginning of the end of the pandemic.** The future of human capital.
Dickerson from Cognizant (2020)	4	The clean regime, The showroom is your room, Rise of the Health Security Agency, and Blinding bias in tech.	Facial recognition: damned or favored. Pandemic: prevented or continued.	**The beginning of the end of the pandemic.** The increase in the use of augmented reality and facial recognition and the bias issue surrounding it.
Business for Social Responsibility (2020)	3	Winners and losers, Community safety nets, and Build back better.	The success of containment efforts and the socio-economic policy response.	**Post-pandemic context** The toll of the pandemic on human life and how the economy will be reshaped.
JFN (2020)	4	A new renaissance, Haves and have nots, Back to the 1930s, and A smaller but tastier pie.	Strengths of economic indicators, the equality and levels of cohesion in society.	**Post-pandemic context** How the United States and the world will look in a time-frame of two years.
Global Compact Network South Africa, (2020)	4	Planting for some, A harvest for all, Drought and desolation, and Lying fallow with weeds.	Economic landscape based on decline-recovery. Socio-political landscape from the perspective of conflict and cohesion.	**Post-pandemic context** What the future will look like for businesses and what they need to plan for.
IMD, (2020)	4	Global marketplace, Digital reset, Back to the basics, and Walled gardens.	Virus longevity: short vs. long term impact. Global mindset: global acceptance vs. global rejection. Digital adoption: digital acceleration Vs. Digital skepticism.	**Post-pandemic context** The global environment, the business landscape, market regulations, innovation trends, and consumer engagement.
IISS, (2020)	4	Silver linings, Downfall, Lost in transition, and Home alone.	Governance and geopolitics, economic reordering and recovery, armed conflict and military posture.	**Post-pandemic context** Impact of the COVID-19 pandemic on the global political, economic and military balance of power.
WEC, (2020)	4	Pause, Rewind, Fast forward, and Re-record.	Ambition, trust, and ability to control the virus.	**Post-pandemic context** Shift the pace and direction of the global energy transition.

tion will not be an easy task, they developed four scenarios based on three key uncertainties: ambition, trust, and ability to control the virus. The exercise considers how these uncertainties blend to shift the global energy transition's pace and direction, as shown in Table 16.

RESULTS

Based on the information about the different sets of scenarios regarding the COVID-19 pandemic, Table 17 presents a brief comparison between them.

As shown in Table 17, the use of scenarios when facing a crisis can be quite diverse. The focus can vary depending on the interests and goals of the creator, but one thing they all have in common is the integration of external factors that directly impact a community, organization, industry, or country. Most of the scenarios that have been presented consider the development and availability of the vaccine as a key determinant in how the future will unfold. However, effective treatment options are not mentioned, only preventive measures.

In the cases that were reviewed, the economic implications of the pandemic were a constant. Some scenarios focused more on the aspect of digitalization, and others concentrated on more specific issues such as racism. Only a few integrated environmental elements, which is unexpected since these types of crises are closely tied to the negative impacts of globalization. Even with a crisis as specific as the COVID-19 pandemic, the scenarios that were analyzed showed great diversity in terms of their critical uncertainties or key factors.

Crises tend to have a high level of unpredictability, and even if the COVID-19 pandemic can be considered as a "black elephant" or even a "gray rhino" type of event, meaning that experts could see it coming, there are things no one could predict. This is the main reason why scenarios are great tools in times of crisis; they allow to explore multiple possibilities and prepare for every one of them, making a crisis far more manageable.

As there are different phases to a crisis, it is interesting to analyze how the scenarios that were included could be classified in terms of their orientation, ranging from a prolonged pandemic context to a post-pandemic environment. The focus of each set of scenarios depends greatly on the potential impact of the key uncertainties in a specific field, be it technological development, employment, commerce, inequality, the economy, public policy design, political shifts, and even international relations.

FUTURE RESEARCH DIRECTIONS

It is quite possible that the use of scenarios will increase in the near future. Ex-ante and ex-post analysis will help determine which were the most plausible or accurate scenarios. It is essential to state that scenarios do not aim to predict the future but to prepare for multiple alternatives. In this sense, analyzing scenarios when they are first created and then when their time-frame ends can help identify which had the most planning potential.

Establishing comparisons between scenarios from different industries and countries to find whether there are differences in how they are developed can improve strategic planning through the implementation of broader perspectives.

CONCLUSION

Apparently, the COVID-9 pandemic renewed the interest in scenario planning, and the technique has become more relevant in organizations, industries, and sectors facing increased uncertainties. In times of crisis, strategic planning through methods such as scenarios can be a valuable tool to help give meaning to fast changes and respond to them more appropriately and effectively (Social Finance, 2020).

Considering alternative futures can also help in decision-making processes when scenarios follow a cause-effect structure. It is safe to say that scenarios will not provide all of the answers, but they help people ask better questions and prepare for the unexpected (Roxburg, 2009). Scenario planning provides clarity by exploring a range of possibilities to guide decision-making in what has been considered to be complex and fast-changing times; it promotes uncertainty management.

By evaluating diverse possible outcomes, these strategies aim to delimitate what needs to be considered by prioritizing the challenges and opportunities the future holds. Similarly to problem identification matrices and methodologies for the study of risks, scenario planning allows to make assessments about the potential impact and severity of specific situations; however, it also promotes insight into circumstances that could be favorable and how to integrate both approaches in a way that helps establish criteria for objective decision-making. Scenarios incorporate a way of thinking about the future that facilitates the development of short, medium, and long-term strategies to prepare for and manage crises in the most efficient way possible.

In terms of the COVID-19 pandemic, and more specifically, the scenario planning exercises analyzed in this chapter, future thinking for crisis management had a wide range of time frames. Starting with what people should expect from the health crisis, how it would evolve, who would take part in the intervention of the issue, and how and when the problem would start to get better. Finally, many scenarios involved a medium/long-term perspective that encompasses some of the deeper consequences of the pandemic on socio-political systems, the economy, and even individuals for years to come.

Because the world is in permanent evolution, uncertainty-and the possibility of crises- presents itself as a series of challenges that need to be continuously addressed. Scenario planning allows learning from the crisis at hand, determine what should be done to overcome it, which actions should be strengthened, and what to stop doing (Social Finance, 2020). In this process, scenarios also help update or upscale existing plans by evaluating their objectives in terms of changes in the reality they were set.

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KEY TERMS AND DEFINITIONS

Alternative Futures: A series of imagined but plausible states of things set in a world further down the road.

Chaos: A state of disorder, confusion, and uncertainty, often linked to unmanaged crises.

Crisis: An imminent threat to stability.

Forces: Conditions that promote change.

Scenario Planning: Method for studying different alternatives of what could happen in the future simultaneously and preparing for them.

Trends: A direction in which things are changing.

Uncertainty: A lack of certainty about future conditions, contexts, and environments.

Section 2
Management and Disruption

This section is made up of five chapters in which concepts, tools, and methodologies related to the management of the covid pandemic are developed, how companies have disappeared and will disappear due to the impact of technology and project management, and its relationship with the management of disruption.

Chapter 10
Corporate Social Innovation During the COVID-19 Pandemic:
Some Practices From Colombian Companies

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ABSTRACT

Given that the COVID-19 pandemic resulted in an unprecedented scenario, there were no previous lessons learned about the organizational responses to social problems. As a result of the above, this chapter describes the practices used by seven Colombian organizations to face the first months of the pandemic based on corporate social innovation framework. A qualitative approach was used to carry out the study and a qualitative content analysis as a research method. The results obtained indicate that the companies participating in the research developed actions in the four pillars, with actions associated with social issues being more prevalent, especially concerning workers and vulnerable populations.

INTRODUCTION

During disruptive situations such as those caused by the Covid-19 pandemic, Corporate Social Innovation (CSI) represents a powerful tool that organizations can utilize in addressing issues and challenges fac-

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ing society, developing joint efforts with academia, NGOs, government and other stakeholders (Rutgers Institute for Corporate Social Innovation RICSI, 2020).

The Covid-19 pandemic has indisputably brought about adverse effects such as loss of more than two million people (World Health Organization, 2020), loss of jobs (International Labor Organization ILO, 2020), and the contraction of the economy, trade, production and financial markets (World Bank, 2021). In Latin America, the crisis has been even more dramatic, given the region's limited space for increasing its fiscal spending, including a level of informality that is around 53% (Economic Commission for Latin America -ECLA, 2020).

In the case of Colombia, a country that pre-pandemic was already facing low productivity, high levels of unemployment, fiscal deficits, and social inequality (Dinero, 2020) the Covid-19 crisis had important consequences. Thus, for example, for some members of the Colombian Association of Small Industrialists (ACOPI, for its acronym in Spanish) the crisis generated by the pandemic precipitated the loss of jobs and difficulties in recovering portfolios (ACOPI, 2020). Data provided by the National Administrative Department of Statistics (DANE, 2020) indicate that for the month of April 2020, 31.4% of the companies reported normal operation, 40.5% reported partial operation, and 28.2% reported temporary closure.

Given that the Covid-19 pandemic resulted in an unprecedented scenario, there were no previous organizational experiences (academic oriented or practice oriented) that could have served as a template for implementing the appropriate responses. Therefore, Gafni (2020), inter alios, have given strong consideration to CSI as a tool to develop business activities that would allow for meeting social needs while obtaining positive results for companies.

Although CSI as a concept has been employed since 1999 by authors such as Rosabeth Kanter (1999), the academic literature on this topic is limited; even more limited are models that lay out the organizational implementation of CSI strategies. In this sense, it is necessary to achieve a greater understanding of how to integrate these models into business strategy (Alonso-Martinez et al., 2019, Tabares, 2020).

In view of the above, this chapter proposes the following question: **In what ways can organizations employ Corporate Social Innovation strategies to aid in the management of disruptive situations?** To answer this question the chapter is structured as follows: (1) the conceptual framework around CSI is developed; (2) the study's methodology is outlined; and (3) the results and conclusions are presented.

Research Framework: Corporate Social Innovation

Relatively recently, CSI has gained wider popularity as a powerful tool for organizations to use in the solving of social problems while generating organizational results (Pol and Ville, 2009; Tabares, 2020). As a concept, however, CSI is a sparsely studied field (Caroli et al., 2018; Martínez, 2017; Tabares, 2020), with a limited understanding of how it can be incorporated into business strategy (Alonso-Martínez et al., 2019, Tabares, 2020). In table 1, a synthesis of this concept is presented. For the purpose of this chapter, we agree with Tabares (2020), who identified four currents streams in the CSI study, namely: (1) CSI as part of the business strategy, business model, development of market-based solutions and identification of business opportunities; (2) CSI as a response to social problems, functional needs and social challenges through business solutions; (3) CSI understood as an innovative activity; and (4) CSI as a result of co-creation between the organization and different actors in society (p. 322).

In a disruptive context such as that generated by the Covid-19 pandemic, Gafni (2020) proposes a CSI model that is composed of four pillars: (a) Philanthropy; (b) Support for public policies; (c) Corporate Social Responsibility programs; and (d) Creation of Shared Value, as illustrated in Table 2.

Table 1. Definitions of CSI

Source	CSI Definition
Kanter (1999)	Rosabeth Kanter departed from this idea by introducing a new paradigm in business. The opportunities for innovation of which were conceived as "learning laboratories" to solve problems or unmet needs in society, by labelling this topic as corporate social innovation (CSI).
Auerswald (2009)	This author defines innovation as a different solution to a social problem that is more effective, efficient, sustainable. The value created from this solution is mainly to society rather than for a company.
Okereke, Wittneben, and Bowen (2011)	Social innovation has long occurred within larger, more established nonprofit organizations as well as for-profit corporations through practices associated with corporate social responsibility (CSR) that aim to address large-scale social problems such as climate change.
Herrera (2015)	Social innovation is a measureable, replicable initiative that uses a new concept or a new application of an existing concept to create shareholder and social value. Identifying drivers, enablers, and barriers to idea generation, experimentation, and implementation is critical to understanding CSI institutionalization.
Carberry (2017)	Corporations are the source of many large-scale social problems, so it is essential to focus more attention on social innovation within them. CSI, thus, recasts such practices in terms of their ability to address social problems in novel ways, shifting attention away from CSR's.
Chin (2019)	Corporate social innovation is a novel, strategic means for enterprise to establish competitive advantage through collaboration with powerful stakeholders, like governments, where firms are simultaneously able to meet social needs and benefit themselves.
Dionysus (2019)	An initiative that aims to create both shareholder and social value with the potential to alter the structure of innovation systems, improve employee motivation, and change corporate identities and strategies to increase competitive advantage, while at the same time bringing solutions to societal needs.
Gafni and Wirtenberg (2020)	Corporate social innovation (CSI) includes a wide range of skills and competencies within the company's innovative business models. CSI seeks a positive impact on society, and in turn, success and sustainability for the company.

Source: Authors based on the literature review

There are several papers that support and encourage the study of CSI. Some of the main motivations include: 1) It helps to create and sustain social movements. According to Carberry (2017), social entrepreneurs and social movements often have a coevolutionary relationship. When employees and consumers identify with the company's goals they will support all of the company's initiatives in order for it to succeed. If the opposite is true, activists can directly affect a company's economic performance and reputation through a variety of tactics, such as protests, boycotts, and media smear campaigns; 2)

Table 2. Pillars of corporate social innovation

Pillars	Description
Philanthropy	Actions through which organizations provide in-kind support and money
Public policies	Actions that contribute to public policy
Corporate social responsibility programs	Actions that allow the use of the organization's resources for the benefit of society
Creation of shared value	Actions that allow the organization to develop new products and services to solve unmet social needs

Source: Gafni (2020, w.p)

It enriches research fields related to innovation, organizational design, finance, and corporate responsibility. These elements are important for future research and its practical application (Chin, 2019); 3) It employs an appropriate methodology and a basis for the development of management tools for an increasingly dynamic and demanding social environment. Considering that a CSI strategy focuses on creating economic and social value for a company, all those in charge of implementing this strategy combine their efforts to apply management tools to this end (Caroli, 2018); 4) It helps organizations, companies, entrepreneurs and policy makers to find new ways of operating, as well as innovative solutions. Here practitioners and academics can develop original or "novel" projects that break down the boundary between public and private across sectors and industries (Chin, 2019).

In Table 3 some examples of CSI initiatives around the globe are presented. It can be seen that business-university-government cooperation is fundamental for the development of multidisciplinary projects that in turn create economic and social value.

Since CSI is a relatively new topic, most available works are developing theoretical frameworks (Amran et al., 2021; Dionisio, 2020, Tabares, 2020). However, there are still few empirical studies in the developed countries context. Based on CSI and business model literature, Tabares (2021) identifies that B corporations are reducing agricultural problems, corruption, poverty and climate challenges. Her work focuses in 18 enterprises from Colombia. Among the best practices to achieve these goals are: the introduction of novel organizational practices, innovative environmental solutions and empowering communities by delegating more responsibilities to their own members. Likewise, Muthuri et al., (2012) synthetizes different articles that focus on countries such as India, Congo and Kenya. For them, a successful CSI strategy could be implemented in places where the institutional environment fosters public-private partnerships for sustainable community development. In some places, company performs a state-like role. They have to look for innovative forms of governance to promote peace in their local contexts. In this sense, enterprises applying CSI initiatives get competitive advantage not around efficiency and cost reduction but rather around competitive differentiation.

Given that the Covid-19 pandemic turned the whole world into a context for developing actions that, from the company, would contribute to overcoming socio-economic and health needs, among many others, this chapter focuses on analyzing the managerial actions that were adopted by a group of companies operating in Colombia, as a response to this situation.

METHODOLOGY

Type of Study and Scope

This study subscribes to the interpretive practice of qualitative research, which seeks to understand the meanings that people give to social phenomena and thus contribute to a better understanding of them (Denzin and Lincoln, 2016).

In addition to the above, this study utilizes qualitative content analysis, which is understood as "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh and Shannon, 2005, p. 1278). In particular, this study employed a directed content analysis (Hsieh and Shannon, 2005). This is because the categorization of the information was carried out taking into account the definition of the pillars of social innovation proposed by Gafni (2020), as illustrated in Table 2.

Table 3. Corporate social innovation initiatives

Source	Initiatives
Herrera (2015)	3M consults consumers in product development and participates in research networks to develop eco-friendly products. The company believes that the best approach to innovation involves people working together, especially in close coordination with customers and suppliers.
	Intel Education Programs focus on expanding academic opportunities. Intel's position is that technological literacy alone is insufficient to address poverty but that technology can be used as a vehicle for social inclusion through learning, livelihood, and employment.
	Intel's environmental programs include the Intel Open Energy Initiative, LEED green building certification, water use and recycling, and solid waste recycling program. Intel's supplier code of conduct covers labor and environmental standards. Intel also supports the global campaign against conflict minerals.
Mirvis et al. (2016)	Loblaw companies, Greenpeace, the World Wildlife Fund-Canada and the Marine Stewardship Council (MSC) aim for sustainable fish sourcing, an effort that requires collaboration and innovation based on trust.
	Bill and Melinda from the Gates Foundation provides funding to SC Johnson to develop the insecticide market in several emerging countries. SC Johnson, in partnership with USAID and Texas A&M's Borlaug Institute, works with rural agriculture to educate communities about sustainable agriculture. SC Johnson has proposed a motorcycle-based distribution system for parasecticides in malaria-endemic areas.
	WaterHealth International (WHI) develops and supports financially sustainable water treatment plants that use reverse osmosis and ultraviolet technologies to provide access to safe and affordable drinking water. Since its founding in 1995, WHI has installed more than 500 WHCs in underserved rural areas in India, Bangladesh, Ghana, and the Philippines.
	Intel competes with Google and Facebook in the "war for talent." Sponsoring, incubating, and mentoring social entrepreneurs requires further investment but also teaches firms how to produce social innovations, connects firms with an ecosystem of social entrepreneurs, and can spillover into social intrapreneurship among employees (Davis and White, 2015).
Chin (2019)	This article mentions corporate universities (CU) as a model of creative innovation between business and government. Scholars have suggested that the building of corporate universities (CUs) can be seen as a typical manifestation of CSI (education), given that CUs not only assist firms to develop valuable human capital for themselves, but also diffuse critical knowledge to all involved, as external actors. For example, the well-known Apple and Huawei universities have helped their companies build strong bonds with local communities in host countries.
Dionysus (2019)	Phillips' BoP (Bottom of the Pyramid) initiatives encourage all the five Philips Product Divisions (Consumer Electronics, Domestic Appliances, Medical Systems, Lighting and Semiconductors) to foster new business models in South Asia. In terms of external results they obtained customer value creation through initiatives that provided products that were cheaper, sustainable, and with superior technology. In terms of internal results, the case unearthed commercial viability from a business perspective at the same time that reputational impacts were acknowledged throughout all BoP ventures with overwhelming employee engagement and very high levels of motivation where involvement in poverty alleviation and sustainable development was perceived as very rewarding with employees describing feelings such as pride and honor.

Source: Authors based on the literature review

Participants

The study participants comprised seven entrepreneurs from Colombia, who were selected through a *Purposeful Criterion Sampling Strategy*, which involves the selection of companies or individuals that meet the criteria previously determined by the researchers (Given, 2008). As a result, managers of large companies, directors of associations or guilds of large, medium or small companies in Colombia participated in this research. The interviews were conducted with managers or representatives of companies in the manufacturing sector, the food sector, for-profit and not-for-profit companies.

Data Collection Technique

A semi-structured interview was used to collect qualitative data through asking participants a series of predetermined questions (Ayres, 2008). It has been noted that semi-structured interviews are most useful when the concepts are well understood because they facilitate a typological analysis (Ayres, 2008). Therefore, in this study, the questions that were part of the semi-structured interview were associated with the actions taken by the companies in the context of the pandemic, as shown in Appendix 1.

Information Analysis Technique

Thematic analysis was used as a technique for information analysis, from which it was possible to "identify, analyze and report patterns (themes) within the data" (Braun and Clarke, 2006, p. 79). This was combined with the implementation of a descriptive coding method, which consists of summarizing in a word or short phrase the basic theme of a piece of text (Saldaña, 2013). Finally, to carry out the analysis of the information, the specialized software Nvivo Plus 12 was used to process qualitative information.

Context of the Study: Colombia and Pandemic

In Colombia, the country's business fabric is made up of 1,619,041 MiPymes (micro, small and medium-sized companies) that are formally registered and generate 80% of employment and a contribution of 35% of the Gross Domestic Product (Confecámaras, 2019; Ministry of Labor, 2019). At the end of 2019, the figures for the creation of new companies showed an increase of 2.1%, for the most part in the services, industry and commerce sectors. The closing of 2019 also pointed to an increase in the growth of the Colombian GDP, ending with a growth of 3.4% and as one of the exceptional cases since the region presented economic difficulties. While these figures show positive results in the country, many analyses have pointed out challenges for 2020 in Colombia, such as low productivity, unemployment, current account deficit and social inequality. Unlike the regional panorama, inequality in Colombia presents the highest Gini index with a measurement of 0.47 (Dinero, 2020).

In 2020, in the midst of the crisis generated by the pandemic, the Colombian Association of Small Industrialists - ACOPI (Asociación Colombiana de Pequeños Industriales) - carried out a survey in April to assess the impacts of the crisis and the prospects of reactivation by entrepreneurs. The results show that 51.35% of those surveyed indicated that their company's growth projection would be affected by 30% or more. Similarly, 50% of the surveyed entrepreneurs identified that the risk of vulnerability would be between high (4) and very high (5) level of risk. Likewise, the surveyed businessmen considered that their portfolio performance would be affected in the next six months. In this survey, 83.64% of businessmen consider that the pandemic would have a negative impact on employment (Acopi, 2020).

Likewise, the survey conducted by Confecámaras for the month of April 2020 reveals business difficulties such as inconveniences in the supply of inputs, price increases, depletion of inventories and difficulties in the import and export processes. This is in addition to the fact that the reactivation processes that had been initiated in the country required biosafety protocols and various implements, where the accompaniment and installation of such protocols and implements increased the costs of reactivation, as well as making capital available for activation.

While mired in lockdown, when observing the states of operation that companies in the country had, we find a normal operation of 45.6%, a partial operation of 43.4%, and a temporary closure of 11% of

the companies (DANE, 2020). In response to the above, the national government generated measures such as credits, liquidity, extension of terms, benefits for companies' utilities, employment protection and production support. Notwithstanding the above, it is common knowledge that the actions taken by governments are not enough, hence the need for the participation of other stakeholders in overcoming this situation.

The following are the results of the study conducted with businessmen in Colombia, describing the answers given by the companies they manage, with a Corporate Social Innovation perspective.

RESULTS AND DISCUSSION

The results obtained in the research are presented according to the four pillars of corporate social innovation proposed by Gafni (2020), as follows: 1) Philanthropy, 2) Support for public policies, 3) Corporate Social Responsibility Programs, and 4) Creation of Shared Value. The following is a description of each of the findings in terms of the four pillars.

- **Philanthropy:** Actions through which organizations provide in-kind support and money (Gafni, 2020)

First, the results obtained show that as a result of the Covid-19 pandemic, businessmen, either directly or through campaigns developed within the companies, contributed aid to those they consider the most needy, through the delivery of food. An example of this is summarized in the following responses:

Table 4. Philanthropy responses - Aids

Subject	Responses
Entrepreneur 2	There is one hundred percent attendance at weekly food markets, because this is a population in extreme poverty. At this moment the "weekly" markets occur only every 10-12 days because of higher demand.
Entrepreneur 4	"...we also help the most vulnerable people who cannot afford it, we are the largest contributors to the food banks, so we help the less fortunate to have at least something nutritious on their tables every morning". "we also support specific campaigns such as those implemented by the Mayor's Office of Bogota to provide food to the most disadvantaged."

Source: Authors

Secondly, the results obtained from the interviews also show that the businessmen expressed an attitude of solidarity and compassion towards the most needy. An example of this is summarized in the following comments:

Moreover, the results of the interviews show that philanthropic actions were extended to support basic service needs such as access to water and communication:

In particular, the results also show that the participation of companies as legal entities in the development of philanthropic actions extended to their employees as social subjects:

Finally, the results show that the companies analyzed in this study also generated monetary assistance to the most vulnerable groups, the company's workers and their families:

Table 5. Philanthropy responses – Solidarity

Subject	Responses
Entrepreneur 2	"For me the most important thing is that the big businessmen found a solution to this issue through human compassion."
Entrepreneur 2	"I believe that the greatest lessons learned of this pandemic are solidarity, compassion, and empathy".

Source: Authors

Table 6. Philanthropy responses – Supporting basic service needs

Subject	Responses
Entrepreneur 2	"The country has understood and the service companies (such as telephony, access to water, access to energy) have understood that social issues must be addressed, for the first time they began to help the most humble people to obtain drinking water, the banks to lend with softer credits, for the first time, the country really began to have a much more humane condition".

Source: Authors

Table 7. Philanthropy responses – Employees involvement

Subject	Responses
Entrepreneur 4	"We have already made two collections of money among employees with very good results, in which we tell them: "You put one peso and the company puts another peso because we have to help everyone".
Entrepreneur 4	**"**On the other hand, there is also an unavoidable reality of the suspension of numerous contracts. However, that has aroused solidarity with and from the employees."

Source: Authors

Table 8. Philanthropy responses – Monetary assistance

Subject	Responses
Entrepreneur 4	"We also provide our most vulnerable group with food support, which is in principle monetary aid, applying to the employee and their family".
Entrepreneur 4	"We also support specific campaigns such as those implemented by the Mayor's Office of Bogota to bring food to the most disadvantaged and public transportation campaigns in Bucaramanga (to avoid or limit contact and follow biosafety protocols).

Source: Authors

- **Public Policy Participation:** Actions that contribute to public policy

The analysis of the practices developed by the businessmen interviewed, regarding their contribution to public policy, in the context of the pandemic generated by Covid-19, revolves around health, social and economic issues. According to the information gathered with some of the businessmen interviewed in this study, support actions were generated to address mental health needs (especially mental) derived from the pandemic, as follows:

Table 9. Public policy participation- Supporting health needs

Subject	Responses
Entrepreneur 2	"…and third, one hundred percent of psychosocial care because cases of domestic violence, suicide attempts or deviations have increased."
Entrepreneur 3	"...we are a consulting firm and we have put this tool at the service of several of our clients, which allows us to have mapped the emotionality of today more than 5000 people during the different moments of quarantine, so I really have a lot of information."
Entrepreneur 3	"Businesses and government should care about mental health. We should make actions for the long term and the best action for the long term is for all of us to invest more in education."
Entrepreneur 4	"Not only us, but how we support the municipalities, universities and governments, we have supported the universities with the whole issue of testing and see how we can help and collaborate to make all businesses viable."

Source: Authors

Likewise, with respect to the support to contribute to public policy in the framework of the pandemic derived from Covid-19, the businessmen interviewed highlighted the development of social support actions, as follows:

Table 10. Public policy participation- Supporting social needs

Subject	Responses
Entrepreneur 6	"One of the major priorities is youth and women's employment. If we do not solve this quickly and efficiently we will lose a generation and it could lead to a disaster that would affect the development of Colombia".

Source: Authors

Finally, in one of the most critical moments of the pandemic, the period during which the data collection for this research was carried out (May-July 2020), the businessmen interviewed made reference to the need to support the national government, contributing to the reactivation of the economy, as follows:

Table 11. Public policy participation- Supporting economic needs

Subject	Responses
Entrepreneur 4	"Support the government and institutions in whatever way we can (for example not postpone our taxes, pay our taxes, because the burden that the government has now is very large), provide help, and we must fulfill our obligations to support the government and help it in the sense of having good practices to share them with other companies and sectors so that we get ahead of this situation and I think this is the time to help. Companies, the state, institutions and civil society organizations should all join forces and support solutions for everyone, including the less privileged."
Entrepreneur 7	"Now we are also worrying about reactivating the economy."

Source: Authors

- **Corporate Social Responsibility Programs:** Actions that allow the use of the organization's resources for the benefit of society.

Based on the definition of corporate social responsibility used in the framework of the Corporate Social Innovation concept, and taking up the dimensions commonly accepted in this context (economic, social and environmental), the findings of the study are described below as follows: actions that contribute to the social dimension, the economic dimension and the environmental dimension (Álava-Larrea and Sánchez-Riofrío, 2016; Altamirano-Velásquez et al., 2015; Lupton et al., 2018; Sanchez-Riofrío and Reyes, 2018).

- **Contributions to the Social Dimension**

The results of the study show that the entrepreneurs who participated in the research carried out actions that help to overcome the crisis with special emphasis on vulnerable groups (teenage mothers), on employees and their emotions, on the development of people management practices that harmonize with the situation, such as flexible schedules, remote access and job security, as shown below.

- **Contributions to the Economic Dimension**

Regarding the actions related to the economic dimension of corporate social responsibility, the results obtained in this study show that the businessmen interviewed took actions such as maintaining jobs, despite the circumstances, as well as paying their suppliers on time or in advance.

- **Contributions to the Environmental Dimension**

- **Creation of Shared Value:** Actions that allow the organization to develop new products and services to solve unmet social needs

Finally, in the present study we analyze the contributions of companies in the Creation of Shared Value in the context of the Covid-19 pandemic. The results obtained show that in general, several of the entrepreneurs interviewed adopted measures that not only involved employees, but also their customers, suppliers and the state. In this sense, the new services developed by the companies participating in the study, to help overcome the pandemic, were associated with the generation of new approaches to their different stakeholders.

In response to our research question: In what ways can organizations employ Corporate Social Innovation strategies to aid in the management of disruptive situations? In sum, we find the following:

CONCLUSION

As Chin (2019) points out, the development of Corporate Social Innovation actions can become a valuable tool for organizations, employees and governments to find innovative solutions and new ways of operating in a dynamic and uncertain environments, breaking down the boundary between public and private, especially in circumstances such as those created by the Covid-19 pandemic. In this study we sought to identify the mechanisms employed by a set of seven Colombian organizations to manage disruptive situations from the perspective of Corporate Social Innovation, for which we used the four-pillar model

Table 12. Corporate social responsibility- Social dimension

Subject	Responses
Entrepreneur 2	"As for the group of teenage mothers we perform virtual academic assistance one hundred percent."
Entrepreneur 2	"As for my work group, we have invested in technological issues so that the teaching is of very good quality and we have a human resources group that constantly monitors the health of workers."
Entrepreneur 3	The first thing was to design an emotional pulse. Since the second week of quarantine we have done the survey every 15 days, which has also allowed us to map the emotions of our team throughout the quarantine."
Entrepreneur 3	"We have to be much more flexible, from the organizational charts, from the decision-makers; to go from hierarchies, where I supervise you, to hierarchies, where we are a team and weave a network. We have to be flexible in more horizontal organizations or operations. This does not mean eliminating hierarchies, it means that I do not invalidate your knowledge or your ability to contribute because I am your boss. There is you, who has knowledge and experience and I validate your knowledge and experience, so that together we build something more powerful."
Entrepreneur 4	"We have provided our employees with equipment, computers and different tools. In addition, they have managed a policy of transparency in formal communication (no gossip) from management to the employee base".
Entrepreneur 4	"They fill out a daily survey to find out their mood, which is mandatory for everyone. In addition, they must record the temperature at the beginning and end of the day. A medical team was hired to follow up the results of this survey and identify possible health complications and mood of the people who work in our company".
Entrepreneur 4	The directory of collaborators was handed out to talk about their emotions. the response from these collaborators was thank you because the main thing was to talk, but even better, to listen".
Entrepreneur 4	"They have been patient and cautious enough to even include the children in the work meetings that take place."
Entrepreneur 4	"We implemented flextime."
Entrepreneur 4	"from the first week in the steering committee we distributed a list of all employees of 50 collaborators each and we were obliged to call each one to talk to them, not about work but how they are feeling, their families, the people were very committed and grateful that we took the time because they knew we were working, but for us it is very important to talk to them, to know how they felt, to answer their questions and if we had no answer, at least we listened to them and they had someone to talk to."
Entrepreneur 4	"we have been very flexible with our workers, even in the meetings we interact with the children and we all laugh about it and tell them bring them, greet them, and I feel that this is also part of this process of accompaniment, because it is what we live."
Entrepreneur 5	"There has been special attention to the development of teleworking, attention to working with workers' families. There are vulnerabilities with respect to health (and mental health) issues. "When we started remote work we thought the challenge would be to connect, but the challenge is not from that, but from human resources, from talking to people, from asking them how they are, how they are handling this situation and it is an area where we have several challenges and we need expert help, but we have achieved a leap, because if something good has brought us Covid-19 is that we have learned how to do remote work. I want an office that can really interact." "We have seen cases that have caught our attention and we have insisted on respecting the time slots, because we have come across people who end up calling the collaborator at 10pm, so we make the workers understand that this works as an office, so that we are not bothering each other outside these time slots."
Entrepreneur 6	"We have done a lot of things internally in the company, from day 1 we started to understand how to be close to the emotional situations of our employees."
Entrepreneur 6	"One of the first things we asked ourselves was what is it that they might be concerned about? And of course there is a concern about health, sanitary, we are all worried about being contaminated or infected by the virus, so in that way we structured a communications campaign and we started to share all the knowledge of the best prevention practices that we were hearing, I think now we are all a little bit experts, but when we started the distancing, how to sneeze, these were things that we were not so clear about.
Entrepreneur 6	When I talk about home office is another chapter, because here what we had to do is a lot of accompaniment in the new routines, occupational health measures, how to prepare our work environment, how to manage a workspace where there are several family members, children, there are interferences of all kinds, there is also a lot of communication and a very important thing, the feeling of isolation, the psychological stress".
Entrepreneur 6	"We have put in place through our health entities a psychological support for those who require it, insisting also on a question of raising your hand when you can't take it anymore, we all need help, to say that we are getting overwhelmed, that we have reached a point where we can't go on, as you will see it is a series of measures aimed at taking care of your physical and mental health and in all this the active breaks, the reminders that at 10 am and 4pm you must make your active break, to seek that physical and emotional balance".
Entrepreneur 6	"For example, one of our commitments at the beginning of the pandemic was to maintain during the first 100 days employment and remuneration at the same level of compliance with objectives, because we knew that there could be vendors who did not reach their sales target, we asked them to take care of themselves, they will not be left without work and we are going to support them. Additionally, we included economic support for transportation, so that anyone who had to be transported could do so by alternative means to public transportation, generating routes where we control the buses complying with biosafety practices".
Entrepreneur 7	"We are developing a strategy that links the worker, but also the space of their families, not only to take care to avoid contact, but also to take care of the relationship within the homes. Today we are proposing (from the company) a care route for the assertive community, to prevent situations of abuse, violence, etc".

Source: Authors

Table 13. Corporate social responsibility- economic dimension

Subject	Responses
Entrepreneur 3	"Generate jobs. Keep jobs. Pay people on time. We must take care of employability and obviously to take care of employability we must have our products and services in place. If those of us entrepreneurs who can maintain employability, it is a great support. I insist: those of us who can, because it is unfeasible to demand a person to keep employees without invoicing a single peso".
Entrepreneur 3	**"**The other big lesson is that we must have organizations that are a financial accordion. We need to redesign compensation models. There are companies that had unviable compensation models designed. They had only designed to bill a lot. If they do not invoice, they have no way to survive because they do not have flexible compensation models and this has been one of the big headaches in the fixed cost of companies. I would think that we should be much more aware of salary flexibility, where variable compensation models are not exclusive to commercial teams, but for many other areas of the organization".
Entrepreneur 4	"We also help the suppliers, the smaller ones, we anticipate their payments, we have to move and we have been very communicated with all of them and we have been very attentive.
Entrepreneur 4	"Payments to suppliers have also been brought forward, especially to smaller ones.
Entrepreneur 4	"Continue to operate responsibly. 2. Continue to support the agricultural and livestock base and areas of influence with which we work".
Entrepreneur 5	"Precisely one of the challenges of this pandemic and what we have fought for is that these great tasks in terms of environment, gender equity, human rights and similar issues are not lost because they are just on the way. "One of the phrases I use the most is: just because we are in the middle of a pandemic does not mean that these general objectives are suspended."
Entrepreneur 7	"The company has been working to strengthen its finances, continue with sustainable development projects, etc."
Entrepreneur 7	"Now we are also worrying about reactivating the economy."

Source: Authors

of CSI formulated by Gafni (2020). The results obtained indicate that the companies participating in our research, developed actions in the four pillars, with actions associated with social issues being more prevalent, especially concerning workers and vulnerable populations. Moreover, we found evidence of actions related to economic and environmental issues, with the special interest of integrating a value creation perspective.

The results obtained in our study lead us to conclude that, as pointed out by Dionisio (2020), the companies sought to create social value without forgetting their shareholders. This is an unprecedented social need in the recent history of mankind, deriving out of necessity due to the Covi19 pandemic, and thus one that demands a response that socially privileged. As required, the response of these companies would be aligned to this conceptual proposal.

Table 14. Corporate social responsibility- Environmental dimension

Subject	Responses
Entrepreneur 7	"We are already looking at electric cars for the distribution of products to reduce consumption, when we are talking about livestock farmers, we are looking at issues of reforestation on farms, so we are already looking in the long term on how to protect the environment and for us it is vital because we depend on the rains, in the sense that if there is no rain there is no milk, so we must ensure the protection of the environment to be sustainable over time.

Source: Authors

Table 15. Creation of shared value

Subject	Responses
Entrepreneur 4	"We must support not only our employees, but also our suppliers and customers in generating information, protocols, we have helped all the farmers with protocols, all our contractors, we have gone to the shopkeepers and we have taken an aid kit to the shopkeepers, so I believe that we should not only look internally but also to our areas of influence, so we can support the government and the country".
Entrepreneur 6	"Businessmen must be committed to the country, betting on the entire value chain that we have in Colombia. We have to bet on the local, see how we can do more to promote local producers, micro-entrepreneurs and small local entrepreneurs, which in that sense has been a definite bet to generate wealth in the country where we are doing our business."
Entrepreneur 6	"...we have worked on our shared value creation model, it is based on generating value for the shareholder, but also generating value for society, that is the only way to generate value for society and it is a kind of virtuous circle, because if you generate value for society you will generate a better business, you will generate better value for the shareholder, so what I just told you can fit perfectly."
Entrepreneur 7	"The sustainability of the ecosystem and communities became a value; today they are part of the company's DNA and strategies. Today they are values of our company, beyond what is required by Colombian legislation. We have compensation plans and programs, in addition to a strategy of education and development of the communities hand in hand sustainable programs seeking to strengthen the nature-development relationship"
Entrepreneur 7	"Local suppliers (small stores, hardware stores...) are the ones who have been affected, as well as the communities. Today they are a very important interest group for our company, so we have been in contact with them through different virtual and telephone tools, inquiring about their feelings and perceptions as a result of the crisis.

Source: Authors

Table 16. Summary of corporate social innovations during Covid-19 pandemic

Pillars	Identified strategies or ways to implement CSI
Philanthropy	• Delivery of food to employees and vulnerable population • Showing compassion and empathy towards all stakeholders • Attention to basic service needs • Promoting employee philanthropy • Monetary assistance to employees and vulnerable groups
Public policy participation	• Support for mental and physical health actions • Support for social actions: Employment for marginalized or socially disadvantaged groups (young people and women). • Financial support: Complying with tax obligations
Corporate social responsibility programs	• Social dimension: Actions aimed at socially disadvantaged workers and groups. • Economic Dimension: Compensation of employees, early payment to suppliers, support to neglected sectors (e.g. agriculture and livestock), reactivation of the economy. • Environmental Dimension; Mitigation of environmental impact and protection of the environment
Creation of shared value	• Integral look at all stakeholders from the business strategy. • Commitment to shared value

Source: Authors

Theoretical Implications of this Chapter

The academic literature on sustainability strategies for handling disruptive situations in corporate set-

tings is limited. Therefore, this chapter proposes applying CSI as a business tool to meet the needs of Covid-19 and in turn obtain positive results. Models that explain how organizations can implement CSI strategies in emerging countries are mostly non-existent.

Another aspect includes presenting new empirical evidence of the effect of CSI on company results and the role played by the business environment. The model defined here takes into account the behavior of Colombian companies in managing disruptive situations such as Covid-19.

In addition, this chapter presents empirical evidence on a new line of research: CSI strategies for dealing with disruptive situations. This may generate a new strategic orientation, especially for those companies affected by Covid-19. Thus, this study becomes a useful tool because of its in-depth analysis of companies in crisis and proposes a new direction of research on disruptive situations, CSI and business results.

Management Implications of this Chapter

The implications for managers involve different aspects. First, it seeks to validate the CSI model (Gafni, 2020) in an institutional environment contrasting with the Anglo-Saxon and Eurocentric ones, in a context of crisis resulting from the current pandemic. For this reason, it is important that managers ask themselves: "What strategies can I implement in my company to contribute to the management of disruptive situations?" And, subsequently, they must be able to identify those tools that confer competitive and corporate advantages to the company. In this chapter we propose with empirical evidence CSI strategies. Second, the company's management must make the decision to implement CSI at the right time (e.g., when value can be created). Third, given that it is more difficult to manage companies in a well-planned and organized way and continue to be profitable in current times, managers must identify whether the company has or should develop the resources and capabilities that work in organizational chaos.

Considering that similar characteristics are prevalent in some Latin American countries (Aguilera et al., 2017; Aguinis et al., 2020) it cannot be ruled out that the results of this work may be of great interest both to executives of Colombian companies and to any other emerging country with an institutional environment similar to that of Colombia. The implications for government leaders include building an institutional environment with rules that encourage and facilitate the application of CSI. Thus, companies are motivated to apply the best managerial practices for handling disruptive situations that allow them to emerge victorious from these precarious environments.

Pandemic Covid-19: Challenges and Future Business Perspectives

Based on the sources consulted and the findings obtained, the challenges and prospects for the future are presented, with a view to overcoming the crisis, but especially so that the Colombian business sector emerges from it strengthened. Such challenges are posed in terms of: a) health-economy convergence; b) the role of education; c) business reactivation and employment generation; d) technology; e) organizational change processes; and f) social dialogue.

Business Recovery and Health-Economy Convergence

The strategy of confinement shows limits in the economic and social dynamics that invite reflection on the need to create a convergence between health and economy that replaces the disjunctive between them

with an articulation that allows them to be integrated, since a productive and stable economy depends on a healthy and wellbeing population, and a strong economy supports the health and wellbeing of the population.

The country's structural difficulties in social matters related to overcoming poverty, reducing unemployment or gender equity are threatened by the dynamics generated by Covid-19, with projections of increased poverty and extreme poverty, setbacks in gender equity policies, company closures and job losses. Therefore, the country must continue to build protection and support policies for companies to prevent their closure and the loss of employment, because the more companies that close, the more supply chains will be affected, and the more workers lose their income. This will, of course, lead to a greater demand for social programs, thus generating more costs in the long term.

Business Reactivation and the Role of Education

The changes generated in the commercial dynamics by the pandemic suggest aligning the supply of employment in all fields of the productive sector with the demand for employment. This process implies regional diagnoses and processes with secondary education institutions to train the labor force to meet the new market, and at the same time retrain the labor force that became unemployed to facilitate their return to the labor market. Such training should be provided from a focus of attention to the vulnerable sectors most affected by the pandemic, which implies a focus on gender, age composition (adults) and vulnerable social sectors. It also suggests a link between government social assistance programs and labor training, in order to make convergence between social policies and economic policies. As a result, this helps to facilitate the entry or re-entry into employment from the new business offer, inasmuch as finally the focus is on building employment programs with differential approaches.

Business Reactivation and Employment Generation

The construction of employment programs can be leveraged from current government programs, adding to the current employment subsidy strategies, coming up with new financial support strategies that focus on the generation of new jobs, reactivating MSMEs that have closed, and through retraining the workforce by offering health safety frameworks to resume operations. In this way, support to the business sector should be thought of from the capitalization of companies that can survive and companies that need to be reactivated to reopen and operate safely.

Business Recovery and Technology

According to each business sector, commercial dynamics will be virtual, semi-presential or face-to-face. During the reactivation process, companies that require semi-face-to-face or face-to-face operations face a greater urgency to create and generate trust building, engage in the reconstruction of the physical space, and develop a citizen culture based on care. On-site presence implies for the companies the need to generate trust in their consumers, workers and suppliers, and readapt the physical space with sanitation protocols that strain the relationship between the consumption space and its economic cost. Agreements must be made and an adequate behavior on the part of the consumers is necessary, one that requires a civic culture in favor of self-care and care for others.

The crisis accelerated the digitalization processes within companies, generating an increase in e-commerce. Companies that choose the path of virtuality must accelerate their entry into the new digital commerce market through existing technologies (technological tools that consumers already have). These new processes involve expanding the digital culture with financial education processes that teach about virtual channels, the new means of payment, and increase the level of confidence in this medium.

The technological panorama invites the need to create an ambitious science, technology, research and innovation policy in the country that includes a technology transfer system for MSMEs that allows them to learn procedures to be more competitive and at the same time the possibility of adopting technology in their territories. In fact, when we see the adjustments that companies have made during the crisis, we observe that innovation begins to represent a figure of 25.7% as a method in companies.

Business Reactivation and Organizational Change Processes

The isolation measures taken by some companies initiated reorganization processes with product modifications (DANE, 2020); others entered into the dynamics of virtual commerce. Likewise, the closure of markets led to seek a supply of inputs through the local market, which opens the discussion to the local substitution of suppliers and the capacity to produce some goods, reducing the dependency relationships in the country.

Business Reactivation and Social Dialogue

Facing the pandemic from the speed and multiple variables that it imposes requires having a constant, direct, simple and fluid dialogue platform available between the government and the business sector so that the latter can point out its needs in the reactivation processes. The direct platform must be built with a local and territorial view that allows a gradual and organized reactivation based on data, geographical reports, continuity of individual measures (hand washing, masks and distancing) and control measures to avoid resurgence scenarios.

Another function of the platform for dialogue between companies and the state is the possibility of diagnosing the effects of the business programs and policies implemented by the national government. It is necessary to know what effects they are having on MSMEs, whether they are adequate or require specific modifications to oxygenate companies, and whether they protect employment.

This current scenario, which is based on uncertainty, points out some limits which, although they do not clearly define the future and are subject to possible solutions in the health sector, begin to mark a point of action. The business sector faces a continuous coexistence with uncertainty, from which it must begin to build, under criteria of responsibility and risk, new strategies of action which may be discovered by diagnosing and evaluating the reorganizations initiated by some companies. At the same time, the issues raised must have medium-term projections, and to this extent the reactivation programs must be permanent and expanded upon.

LIMITATIONS OF THE STUDY

Although the research presented here provides relevant information on management strategies for handling corporate settings in times of crisis, based on a novel conceptual proposal, it has some limitations. For

example, the study was carried out in a single country (Colombia), from a qualitative perspective and with a sample of businessmen, which although not significant, sought to meet the criteria specified by the researchers, for example, that they were large companies, associations of large or small companies. Studies comparing different countries, with quantitative research methods and statistically significant samples, will be required to allow generalization, which is not possible at this time.

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APPENDIX

Interview Questions

1. What actions have you taken in your professional sector or work activity so that employees can improve their emotional states in a healthy way?
2. What do you consider to be the best practices or actions you have seen in your sector for the emotional health care of workers?
3. With the current situation due to COVID-19, what positive or negative actions has your sector promoted to protect the environment?
4. Because of COVID-19, what positive and negative effects have you had on your work-family and perspective-individual relationship?
5. In general terms, what do you think are the main actions that can be carried out from your professional sector and/or labor activity for the reactivation of the country?
6. What are the operating perspectives for your professional sector in the coming year? And what are the long-term prospects?
7. What lessons have you learned during this time that you consider will help you in the reactivation stage?
8. In view of the country's reactivation, what do you think is the distribution of responsibilities of the State, companies and society?
9. In general terms, what do you think are the main contributions that people belonging to your professional sector and/or work activity can offer to the reactivation of the country? Green Business
10. Which of your company's stakeholders do you think will require the most support? Why?
11. In your opinion, what are the barriers to empathy, solidarity and co-responsibility?

Chapter 11
Prediction of the Disappearance of Companies From the Market in Bogotá, Colombia Using Machine Learning

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ABSTRACT

In this chapter, the results concerning the modeling of companies' disappearance from Bogota's market using machine learning methods are presented. The authors use the available information from Bogota's Chamber of Commerce, where the companies are registered yearly. The dataset comprises the years 2017 to 2020 with almost 3 million registries. In this work, a deep analysis of the different features of the data is presented and explained. Next, four state-of-the-art machine learning models are trained for comparison: logistic regression (LR), extreme learning machine (ELM), random forest (RF), and extreme gradient boosting (XGBoost), all with five-fold cross-validation and 50 steps in the randomized grid search. All methods showed excellent performance, with an average of 0.895 in the area under the curve (AUC), being the latter algorithm the best overall (0.97). These results are in agreement with the state-of-the-art values in the field and will be of paramount importance to assess companies' stability for Bogota's local economy.

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INTRODUCTION

The recent advances in machine learning and data availability have increased the capacity to create computational models for decision-making in the corporate realm. These models will have the ability to reduce uncertainty and make informed decisions for the organizations' benefits and the people in general. Economic stability is of paramount importance for society, and the use of these methods can be critical from both private and public perspectives.

The previous global financial crisis has shown how the lack of control from governmental institutions can hardly impact all societal network levels, especially the lower layers. Many regulatory frameworks arise aftermath, targeting mainly financial institutions and insurance operators (Acemoglu, 2015). Thoughtful modeling of companies' future capabilities to remain competitive in the market has become a necessary element, not only from the management of the individual companies but also from governmental and financial institutions. Companies can use these models to establish future business strategies or strengthen the current ones. Banks, public institutions, and private investors can predict future capabilities or assess future business risks, capital investing, loans, subsidies, among others. The goal is to keep the market's stability, generate profit, and in general, produce a steady and continuous wealth for the whole society.

The rapid development of centralized information databases and the processing power and the accessible specialized software have shifted the classical analysis of companies from statistical modeling to more data-centric approaches since Altman's seminal work (Altman, 1968). A decade later, Ohlson (1980) pioneered machine learning strategies for corporate bankruptcy modeling. Nowadays, most predictions are made by adopting optimal classification algorithms, ranging from logistic regression, support vector machines, and decision trees to more complex deep neural network modeling (Qu, 2019). Moreover, other methods such as genetic algorithms (Jiang, 2009), particle swarm optimization (Chen, 2013), or even reinforcement learning (Espinosa-Leal, 2020) algorithms have been proposed in combination with machine learning to improve the models' prediction capacity. Furthermore, an additional challenge is finding the right models where explainability and interpretability balance with the prediction accuracy and the possibility of the ethical assessment to avoid biases in the algorithms' outcomes.

In this work, we study and present the results concerning the prediction of the disappearance of companies registered in the commerce of Bogota, Colombia, during the period 2016 until 2019. This data is updated every year. Therefore, if a company fails or does not add its name in the chambers' registry, it is automatically declared closed or out of business starting that year. This fact can be considered an arbitrary generalization. The original information contains other valuable information such as size, legal type, economic sector, number of employees, as well as other features. This data can be used for analytics purposes using cutting-edge statistical and artificial intelligence methods. Hence, we model companies' disappearance following the registry, as mentioned earlier, if they have or have not been renewed in a specific year. Upon a full statistical description of the dataset, where each variable is presented and described, a feature selection process of the data is performed. In the final stage, we split the dataset into two subsets, one for training and the other for testing, then fit four different machine learning methods: Logistic Regression (LR), Extreme Learning Machine (ELM), Random Forest (RF), and eXtreme Gradient Boosting (XGBoost) with a complete parameter's optimization to ensure the final model is optimal. The obtained scores are presented with the testing subset.

This chapter is organized as follows: In the background section, a compilation of the most recent and relevant works in the topic of machine learning modeling for predicting bankruptcy or insolvency in companies, as well as their predictive capabilities is presented and discussed, then in the research

settings section, a detailed description of the dataset used in this investigation is provided as well as the machine learning models and the research protocol and computational libraries. The main results provided by the fitted models are explained in detail and illustrated. A comprehensive explanation of the obtained results is offered in the findings section, including a description of the dataset's variables, plots for comparison, and other descriptive information. Then, in the section Future research directions, we showed a detailed list of future ideas to be explored to improve our models' predictive capacity. In the final section, we expose the conclusion of this work.

BACKGROUND

This chapter starts the background discussion, recognizing that even though the main focus of this work is about predicting business closure, in a general sense, it can also be seen as a way of predicting bankruptcy in firms. It is considering that a business with significant profits should not close from a rationality point. Nevertheless, it was also possible to identify relevant literature related to business closure prediction (not based on bankruptcy filings) in two different regions, Brazil and Israel.

With this clarification in mind, the authors begin by using the critical finding provided by Shi & Li (2019), where a bibliometric study of intelligent techniques for predicting bankruptcy is made. It is essential to mention that his work recognizes the seminal importance of the study made by Altman (1968) but instead focuses the analysis mainly on models that use some kind of machine learning or intelligent system rather than a deterministic mathematical model. Nevertheless, in a reference co-citation analysis, Shi & Li (2019) found that 413 (around 70%) of the analyzed papers cited Altman's, followed by Ohlson (1980).

Shi & Li (2019) use the VOSviewer software to analyze the academic papers and their evolution with the subject matter related to bankruptcy prediction. During the last ten years, around 35 papers are published each year.

Now, considering the findings by Shi & Li (2019), it is time to start by looking at the work of Altman (1968). In this paper titled "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy," Altman introduces the technique of Multiple Discriminant Analysis and used multiple financial ratios as data sources and input variables to determine the probability for a firm to go bankrupt. Altman used a sample of 66 companies, with 33 of them in the category of bankruptcy and the other 33 in the non-bankruptcy group. Although his main objective was not to create a model to predict business bankruptcy but to persuade the reader of the usefulness of financial ratios, he ended up proposing a quantity named z-value, in which all firms that had a z-value below 1.81 were all bankrupt. Altman's model can correctly predict the chance that a firm will file for bankruptcy in 94% of the initial sample (manufacture firms).

Motivated by the work by Altman (1968), but recognizing the practical and theoretical limitations of Multiple Discriminant Analysis (mainly issues regarding the assumptions about normally distributed predictors, or variance-covariance matrices similarity among predictors), Ohlson (1980) is the first author to implement a Logit Model for the task of predicting bankruptcy. However, even if he used a different technical approach for the prediction process, the main variables used as predictors remained financial ratios. His model achieved a classification error that was lower than 13%. As Shi & Li (2019) found, Ohlson's and Altman's papers provided much of the inspiration for research in the field. They

framed how bankruptcy prediction research over the years was carried out, in which different authors implemented different mathematical algorithms over different data sets.

Regardless of the clarification contained in the first paragraph of this section, two related works that look for factors that impact the premature closure of businesses (and not focused entirely on the bankruptcy aspect) are those developed by Marom & Robert (2014) and Bohn, Gambirage, da Silva, Hein, & Largas, (2017).

In Marom & Robert (2014), the authors implement a logistic model in which financial ratios, management, and business environment variables are used as input to predict the chances of survival of SMEs in Israel. In total, 340 businesses were contacted for the study, but only 205 ended up with valid data for the study. The model developed by Marom & Robert (2014) has a success rate of 85.4%. However, it is essential to notice that they also placed special attention not only on the model's predictive power but also on the variables that contribute the most to explaining success or failure in a company.

Now, In the case of Bohn, Gambirage, da Silva, Hein, & Largas (2017), also a logistic model is implemented with variables gathered from a poll that asked about specific information regarding management, working capital, high costs, and business environment of firms in the Santa Catarina coastal area in Brazil. The data used in this study comes from 36 firms, where 62% of them belong to the services sector, 23% to retail, 5% to construction, and the remaining 10% to the manufacturing sector. This information is relevant because the analysis that is presented in this chapter also covers data from multiple sectors of the economy. However, it is not possible to identify if this data represents the general business environment of the region. Finally, it is worth mentioning that the model developed by Bohn, Gambirage, da Silva, Hein, & Largas (2017) obtained an accuracy of 78%.

It is essential to recognize that the papers that deal with business closure and not with bankruptcy in the state-of-the-art review use SMEs (Small and Medium Enterprises) as their study object. In contrast, those that are related to bankruptcy prediction are focused on Public Traded Firms (which by construction are big firms).

Now, from the technical perspective, one interesting finding is that logistic regression is not only the method that Marom & Robert (2014) and Bohn, Gambirage, da Silva, Hein, & Largas (2017) used but is also found to be the one that is mostly implemented in other studies. For example, Hyunjoon & Zheng (2010) uses a Logistic regression with financial ratios as input variables to predict bankruptcy in the hospitality sector, achieving success rates of 91%.

Alaminos, Del Castillo, & Fernandez (2016) also used a Logistic model with financial ratios as input variables for Public Traded Firms. They analyzed a total of 440 non-financial companies in Asia, Europe, and America. One of the main objectives of this paper was to create a global model for bankruptcy prediction; hence, firms from different continents made sense. Having data from different geographies allowed them to develop models for each market (Asia, Europe, and America) and a fourth model that included all the observations in the same pool called the Global model. This study presented models able to attain accuracies of over 80%.

Now, Jabeur (2017) not only implements a Logistic Regression but also uses Partial Least Squares Logistic Regression to increase the success rate of his models, moving from 93.25% to 94.5% in the testing data set, when compared with a regular Logistic Regression. This model also used financial ratios as input variables for the model.

It is also possible to find authors that implemented one algorithm and used different techniques to evaluate and compare their performance. In his undergraduate program thesis, Montero-Casarejos (2016) uses support vector machines, decision trees, k-neighbors, genetic algorithms, neural networks,

and Ensemble Methods to predict business bankruptcy in commerce businesses by considering profitability, efficiency, and financial indicators of companies. Ensemble methods got the higher results with an accuracy of 93.47%.

Next, in an undergraduate thesis, Mattsson & Steinert (2017) implement three different models (one based on Random Forest, another on Gradient Boosting, and the third one on Neural Networks) to predict corporate bankruptcy using 64 financial ratios as input variables. Area Under the Curve (AUC) was chosen as the performance metric for the models, with Gradient Boosting being the higher among the three models with an AUC of 0.94.

Another interesting paper presented by Wang (2017) where support vector machines, neural networks, and autoencoder are implemented as models that take the same management, financial, and business environment variables to predict bankruptcy. It is important to note that all models have an accuracy higher than 98%, which raises questions about how well the model is learning about the data set (overfitting) that might signal performance issues when tested with out-of-sample data.

Given that some of the methods implemented in work developed by the authors of this chapter are Logistic Regression, Random Forest, and eXtreme Gradient Boosting, one interesting article worth studying is Son, Hyun, Phan, & Hwang (2019). In this work, Logistic Regression, Random Forest, XGBoost, LightGBM, and Artificial Neural Networks methods are implemented, taking financial ratios and business environment variables as input to analyze and predict bankruptcy.

One of the distinguishing of the work made by Son, Hyun, Phan, & Hwang (2019) is the fact that the data set has information about which firms had audits and which do not, finding that the predictive power of the models was higher among firms that have been audited. This might be related to the fact that audited firms could be more careful on their bookkeeping, hence having better data than firms that were not audited. Son, Hyun, Phan, & Hwang (2019) also use AUC as the performance metric to evaluate their models, and all of them have AUCs between 0.67 and 0.88.

At the local level (for Colombia), it is possible to find similar works to the ones presented in this chapter. For example, the one developed by Valencia, Cabrales, Ramirez, & Calderona (2019), where a bankruptcy prediction model for SMEs is developed but with a particular emphasis on its interpretation capabilities, which is one of the main disadvantages of using specific machine learning algorithms.

Ovalle & Heredia (2014) carried out another interesting work in their Master's Thesis. The Altman's Z score is used to predict bankruptcy in Colombian Companies using data from government entities such as the Colombian Superintendency of Corporations (Superintendencia de Sociedades de Colombia).

Other works, such as the undergraduate thesis developed by Penagos & Muñoz (2015) and Parrado (2020), also implement a model for predicting bankruptcy for the pharmaceutical and construction sector in Colombia, using data from government records (once again from the Colombian Superintendency of Corporations).

It is essential to cite four main differences between the work developed in this chapter and those cited previously:

1. The data set used in this chapter covers not only public listed companies (which are significant in market capitalization and operation) but also provides information about SMEs. This is a departure element from previous works where only one type of firm was included in the studies.
2. Companies listed in the data set do not belong to a specific business sector but span multiple sectors of the economy. In many of the works that deal with bankruptcy prediction, most of the time, the data used belonged to only one specific sector of the economy. For example, in Altman

(1968), only manufacturing firms (with a market cap between 1 and 25 million USD), or the case of Montero-Casarejos (2016), where retail firms were the object of study.

3. The size of the data set is significantly greater than the ones previously studied. Our dataset has more than 2.9 million observations, contrasting with other studies where the sample size is relatively small. For example, in Altman (1968), only 66 firms were used, or in Bohn, Gambirage, da Silva, Hein, & Largas (2017), 36 firms were considered in the study.
4. The analyzed data could be viewed as a census because it included all the legally formed firms in Bogota and its surroundings. The data in the study does not come from polls, interviews, or other sampling mechanisms. It reflects the current information that firms must send to the Chamber of Commerce every year.
5. To the best of our knowledge, this is the first work that uses Colombian companies' information from the Chamber of Commerce instead of data from the Colombian Superintendency of Corporations. On the one hand, this allows us to have more data and to include more companies and sectors in the study. On the other hand, from the nature of the information sent to the Chamber of Commerce and the one sent to the Colombian Superintendency of Corporations, it is possible to infer that quality is better for the latter.

From a technical perspective, future works might include the search of unstructured textual data related to the companies under study to engineer more features that could add to the capacity of the models to predict correctly whether a business is going to close or not, in a similar way as implemented by Mai, Tian, Lee, & Ma (2019). There, textual disclosure data extracted from 10-K filings to the SEC (Securities Exchange Commission) that publicly traded firms converted by a neural network model into a Word Embedding Vector. Posteriorly, it is passed through a deep learning model, increasing the accuracy ratio and the AUC (Area Under the Curve) value significantly compared to two benchmark models (logistic regression and Random Forest).

Another area to explore further enhancements is the one related to external data (not generated by the companies) that might give additional information, improving the model's accuracy. For example, D'Silva, Jayarajah, Noulas, Mascolo, & Misra (2018) study the role of Urban Mobility in business survival, drawing attention from business intuition and urban economics that reinforce the effect of agglomeration economies and business location as an indicator of business success. This study is even more relevant in today's reality, where cities were even drawn to a stall due to the Coronavirus pandemic, bringing urban mobility to historic lows. In this study, D'Silva, Jayarajah, Noulas, Mascolo, & Misra (2018) use data crowd-sourced from social networks and transport systems and developed a model with an AUC of 0.8 for all the ten different cities that were included in the dataset.

Research Settings

The data with which this research was carried outcomes from the open data portal of Bogota's Chamber of Commerce. This is a non-profit entity that seeks to promote business skills development and strengthen the business environment in the capital of Colombia. As part of its activities, it consolidates statistics on the commercial registry, a license for the legal operation of companies in Bogota. These statistics are available at https://opendatabogota.ccb.org.co/. Initially, to understand the data, a descriptive analysis of the variables was carried out; with this procedure, it was possible to know the behavior of the quantitative and qualitative variables of the dataset.

Based on the records of the companies that renewed and canceled their commercial registers from 2017 to 2020 (with a cut-off in the second quarter). A set of variables were identified from this data to be used in the four models that predicted the renewal or cancellation of their registry. Based on the above, the variables considered are presented in Table 1.

Table 1. Variables used in the model

Variable	Type	Values	Variable dummy
Commercial register renewal	Binary	1-Renovated 0-Canceled	No
Legal Organization	Qualitative	1-Anonymous 2-Collective 3-Limited by shares 4-Simple Comandita 5-Associative work company 6-State industrial and commercial company 7-Sole proprietorship 8-Foreigner 9-Limited 10-Natural person 11-Simplified joint stock company 12- Retirement pension fund	Yes
Size	Qualitative	1-Large 2-Median 3-Microenterprises 4-Small	Yes
Sector	Qualitative	1-Agricultural 2-Trade 3-Construction 4-Industry 5-Mines and quarries 6-Services	Yes
Number of establishments	Quantitative	Values between 1 and 2297	No
Number of employed personnel	Quantitative	Values between 1 and 90,000	No
Importer / Exporter	Qualitative	0-No data 1-Exporter 2-Importer / Exporter 3-Importer	Yes
Total asset value	Quantitative	Values between 1 and 1.91242E + 15	No
Total value of liabilities	Quantitative	Valores entre 1 y 3,13034E+15	No
Total equity value	Quantitative	Values between 1 and 1.91242E + 15	No
Total net sales	Quantitative	Values between 1 and 9.06101E + 14	No

Source: The authors

A pre-processing work was carried out with the identified variables that included transforming the categorical variables into dummy variables. This is done to represent the qualitative variables, such as the presence or absence of a characteristic; our aim is to arrange the data correctly for the modeling. Table 1 shows the variables that were converted into dummy variables. With the pre-processed data set,

four models were adjusted. The first corresponds to logistic regression. The second corresponds to a random forest, the third corresponds to an extreme gradient boosting, and the fourth corresponds to an extreme learning machine model. The models were evaluated for the algorithm's performance for prediction from the results obtained from the confusion matrix, including Precision, Recall, and F1 score.

The metrics referenced above are used to compare the performance of the models; commonly, the use of just one of them is not adequate to understand the global performance of the fitted models; therefore, the set of metrics considered allows us to review a specific tendency of the dataset. Thus, one way to identify a good performance in all of these is its closeness to one; besides, the accuracy and the AUC are related to the model's general functioning, while the precision, recall, and F1 score are associated with each class.

We have used four different machine learning models to predict the disappearance: Logistic regression (LG), Random Forest (RF), extreme Gradient Boosting (XGB), and Extreme Learning Machine (ELM), a single-layer feed-forward Network (Huang, 2006) with proved capabilities in many areas of research such as computer vision (Espinosa-Leal, 2019), time-series, clustering, edge devices (Akusok, 2019a). The first three models were implemented using the Python programming language through the widely used scikit-learn implementation (Pedregosa, 2011). The latter was implemented using a new python library named scikit-elm (Akusok, 2019b). Both forest models were calculated using the Python Dask library for parallelization (Rocklin, 2015). We have run a randomized grid search with five-fold cross-validation for the models to obtain the best parameters to get better performance values.

FINDINGS

As a result of the descriptive analysis of the variables contained in the dataset, characteristics related to the number of renewals and cancellations of the commercial register were identified; in this regard, it is highlighted that the most significant difference in absolute terms between renewals and cancellations occurred in the year 2019, in this year the renewals far exceeded the cancellations (See Figure 1).

Figure 1. Annual number of business register renewals
Source: The authors

Regarding the distribution of renewals and cancellations according to the type of legal organization, there is a concentration of 52.94% in the category of 10 - natural person; within this category, the renewals and cancellations are distributed homogeneously, because cancellations account for 53.97% of

the registrations, while renewals are equivalent to 46.03%, Table 2 shows the detail of the distribution of the registrations according to the legal organization.

Table 2. Distribution of records according to legal organization

Legal organization	Commercial register canceled	Commercial register renovated	Total
1-Anonymous	35.704	66.494	102.198
2-Collective	359	256	615
3-Limited by shares	1.898	5.062	6.960
4-Simple Comandita	9.617	22.965	32.582
5-Associative work company	1741	764	2.505
6-State industrial and commercial company	7	0	7
7-Sole proprietorship	19.339	28.624	47.963
8-Foreigner	6.251	11.948	18.199
9-Limited	87.654	172.457	260.111
10-Natural person	852.476	727.148	1.579.624
11-Simplified joint stock company	200.418	732.545	932.963
12- Retirement pension fund	4	0	4
Total	1.215.468	1.768.263	2.983.731

Source: The authors

On the other hand, the distribution of the registries was analyzed according to the size of the companies. It was identified that the highest proportion of cancellations and renewals are registered in the Microenterprises category - 3, since they concentrate 84.09% of the registries, within this, there is a higher proportion of registrations that renew; on the other hand, the lowest proportion of commercial registration cancellation occurs in large companies (See Table 3).

Table 3. Distribution of records according to company size

Size of the company	Commercial register canceled	Commercial register renovated	Total
No Data – 0	0,00%	0,00%	0,00%
1-Large	0,18%	1,17%	1,35%
2-Median	0,51%	3,06%	3,57%
3-Microenterprises	38,08%	46,01%	84,09%
4-Small	1,96%	9,03%	10,99%
Total	40,74%	59,26%	100,00%

Source: The authors

In addition to the cancellations and renewals of the commercial registry were analyzed from the sector. As a result, it was possible to identify that the Services sector - 6 presents the most significant number

of registries, representing 44.89% of the total. This sector has a significant difference in the companies that renew their commercial registration compared to those that do not. In this analysis, it was also possible to establish that the Mining and Quarrying sector presents the lowest proportion of cancellations concerning the total of registrations, standing at 0.22%. Table 4 shows the results.

Table 4. Distribution of records according to sector

Sector	Commercial register canceled	Commercial register renovated	Total
No data - 0	1,71%	0,09%	1,80%
1-Agricultural	0,70%	1,46%	2,16%
2-Trade	11,61%	16,05%	27,67%
3-Construction	2,23%	4,01%	6,24%
4-Industry	6,71%	9,87%	16,57%
5-Mines and quarries	0,22%	0,45%	0,66%
6-Services	17,56%	27,33%	44,89%
Total	40,74%	59,26%	100,00%

Source: The authors

As part of the descriptive analysis, the statistics of the quantitative variables of the dataset were determined. As a result, it was determined that the ranges present significant variations mainly in the variables that show the total values of assets, liabilities, equity, and net sales. In general terms, these variables are significantly different from the values of the variables of the number of establishments and employed personnel; this is confirmed if the mean value of these variables is analyzed. Detailed statistics for count, range, minimum, maximum, mean, standard deviation, variance, skewness, and kurtosis are presented in Table 5.

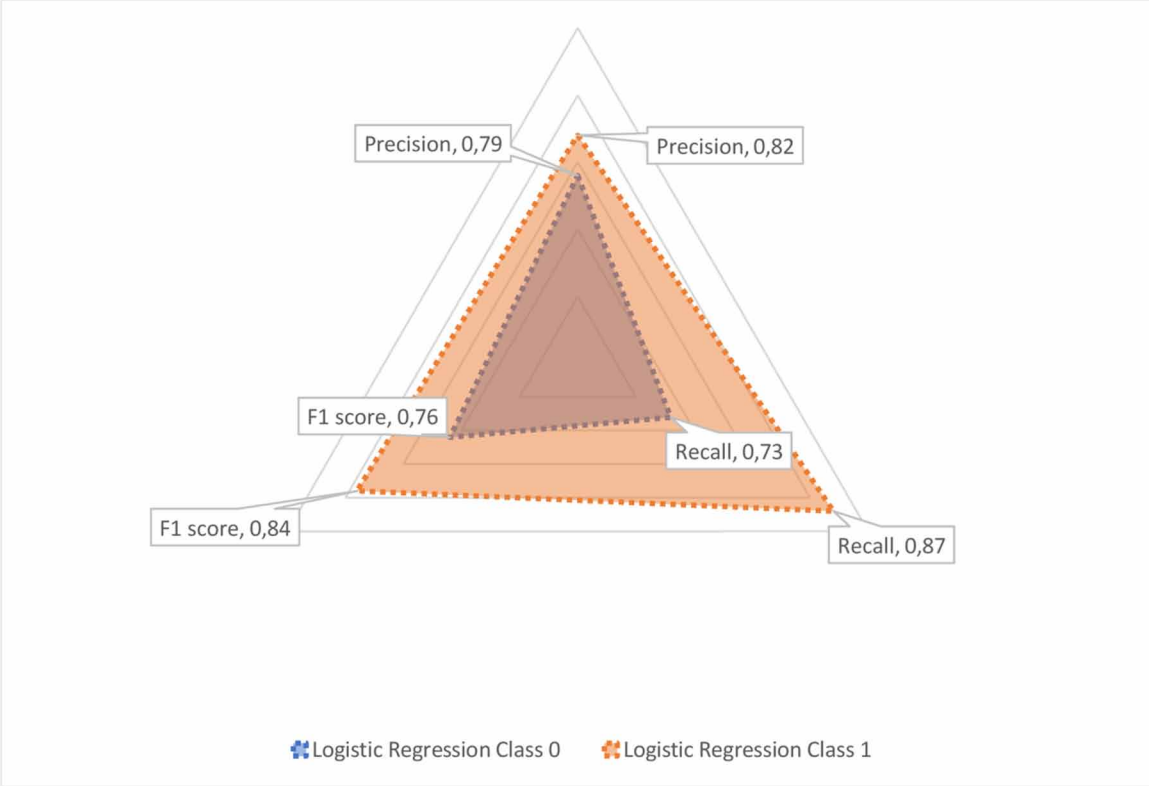
Table 5. Statistics for quantitative variables

Statistics	Number of establishments	Number of employed personnel	Total asset value	Total value of liabilities	Total equity value	Total net sales
Rank	2.327	950.014	1,91242E+15	3,13034E+15	1,91242E+15	9,06102E+14
Minimum	0	0	-10553801	-899074000	-653661805	-922954310
Maximum	2.327	950.014	1,91242E+15	3,13034E+15	1,91242E+15	9,06101E+14
Half	0,8	34,42	10520244533	8722024329	10532410937	3568486629
Deviation	5,786	2.704,595	2,37165E+12	3,64467E+12	2,37153E+12	1,74002E+12
Variance	33,483	7.314.833,863	5,62472E+24	1,32836E+25	5,62414E+24	3,02768E+24
Asymmetry	175,44	269,354	734,742	849,638	734,846	520,589
Kurtosis	58.418,62	80.264,795	577493,036	729514,775	577611,692	271086,235

Source: The authors

Once the dataset records had been descriptively analyzed, the model's performance measures proposed in the methodology for the classification model were obtained. For each of the models, the scores for precision, accuracy, recall, F1 score, and ROC-AUC were determined. In the first place, a logistic regression model was adjusted; in this model, two classes were analyzed, in class 0, the cancellation of the commercial register, and in class 1, its renewal. This allows different values to be had for the performance measures precision, recall, and F1 score; Figure 2 shows the results.

Figure 2. Measures of precision, recall and f1 Score of the logistic regression model for classes 0 and 1
Source: The authors

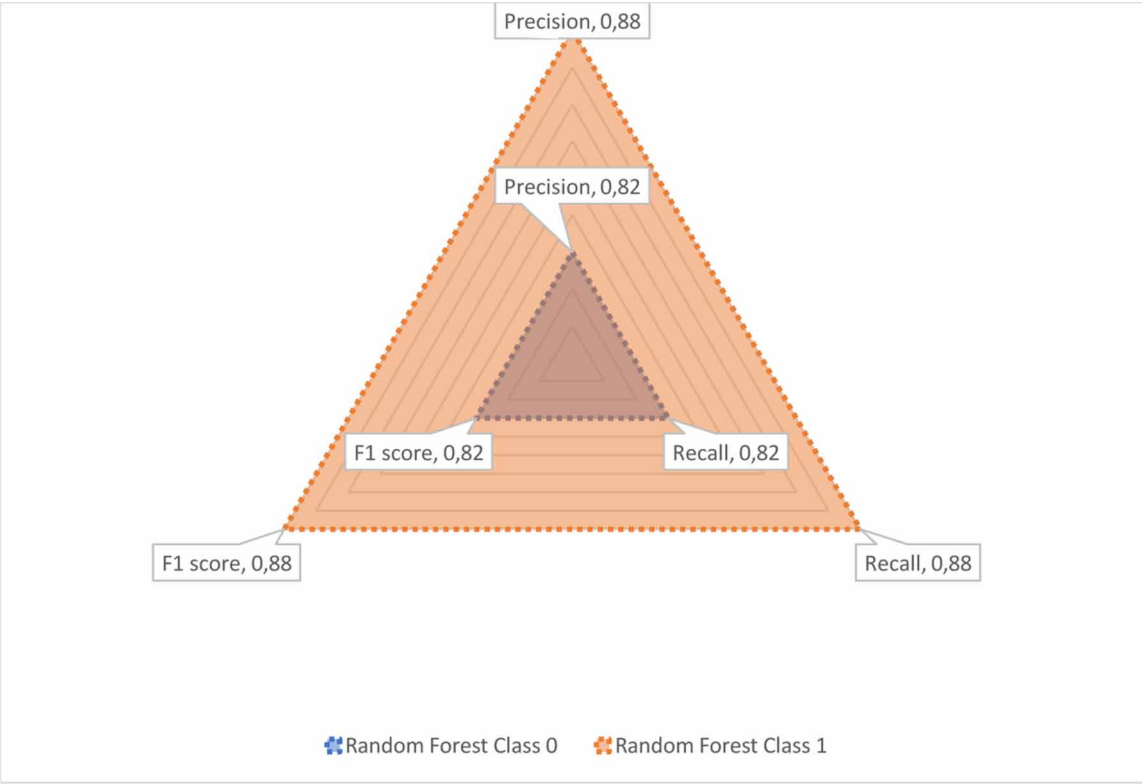


As global performance measures and not by class, accuracy and ROC-AUC were determined. These values were 0.81 and 0.88, respectively, showing a significant performance in the prediction using the logistic regression model.

Subsequently, a Random Forest model was used. For this model, the performances by class were also determined, which registered very similar values for each of the performance measures in each class. The performance measures of the model are presented in Figure 3.

Regarding the global measures of the model, accuracy, and ROC-AUC, values of 0.86 and 0.93 were registered, respectively; this model presented better global performances than the model built with logistic regression.

Figure 3. Measures of precision, recall and f1 Score of the Random Forest model for classes 0 and 1
Source: The authors



In third place, an XGBoost model was run, as the two previous cases were determined the performance measures for each class. In this case, this model showed better performances per class than its predecessors; in Figure 4, the results of the precision, recall, and F1 score.

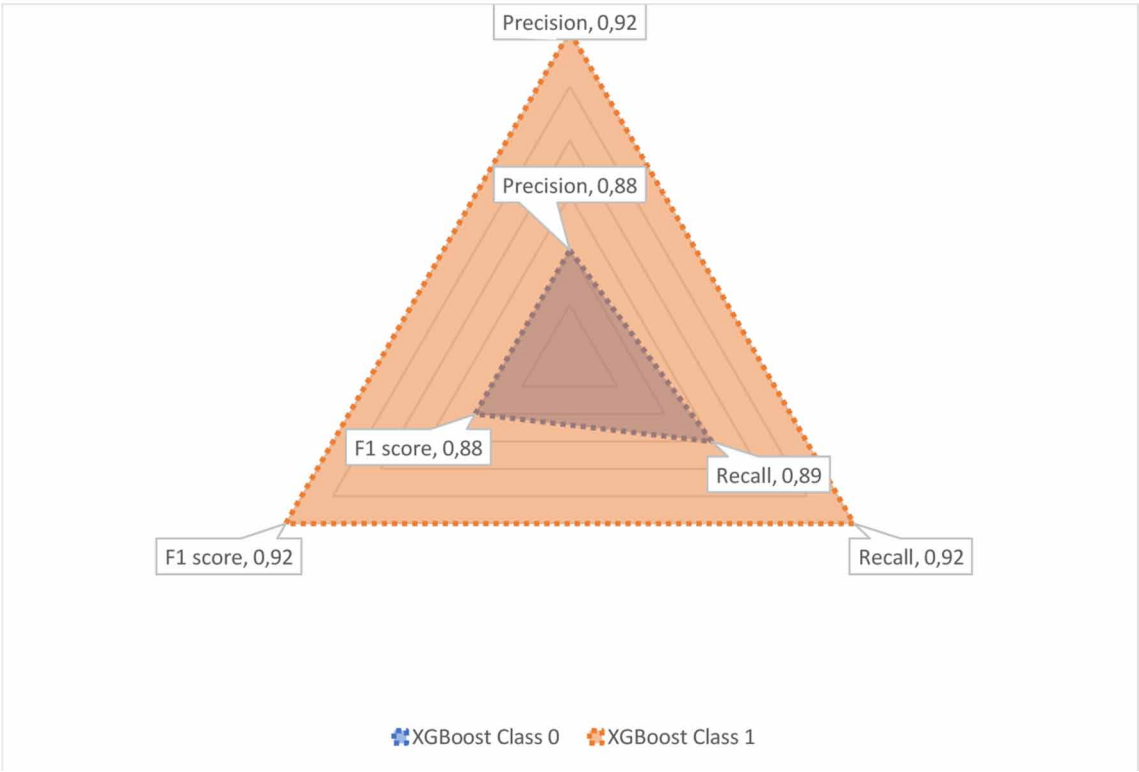
This model registered an accuracy of 0.9 and ROC-AUC of 0.97, which places them as the model with the highest global performances compared to the logistic regression and Random Forest models. Finally, an Extreme Learning Machine - ELM model was used. In this case, the performance by classes was also determined through precision, recall, and F1 score. In Figure 5, the results are presented.

In Figure 6, a consolidated performance measure by class of each of the built models is presented. This figure confirms that the XGBoost represents the most significant performance values compared to the other models, achieving a 0.92 in precision, recall, and F1 score.

Regarding the global measurements of the models, in Figure 7, the values obtained for accuracy and ROC-AUC of each of the models are presented. Here, it can be observed that the XGBoost presents superior performances than the other models that were constructed, maintaining the same performance trend as in the analysis by class.

Based on the above, three important factors can be identified against the contribution of Machine Learning to the research findings. Firstly there is a wide range of possibilities in terms of the models to be used. In the present work, four were used as alternatives. However, a comprehensive set of options allows researchers to select the model that represents the most significant benefits compared to the

Figure 4. Measures of precision, recall and f1 Score of the XGBoost model for classes 0 and 1
Source: The authors



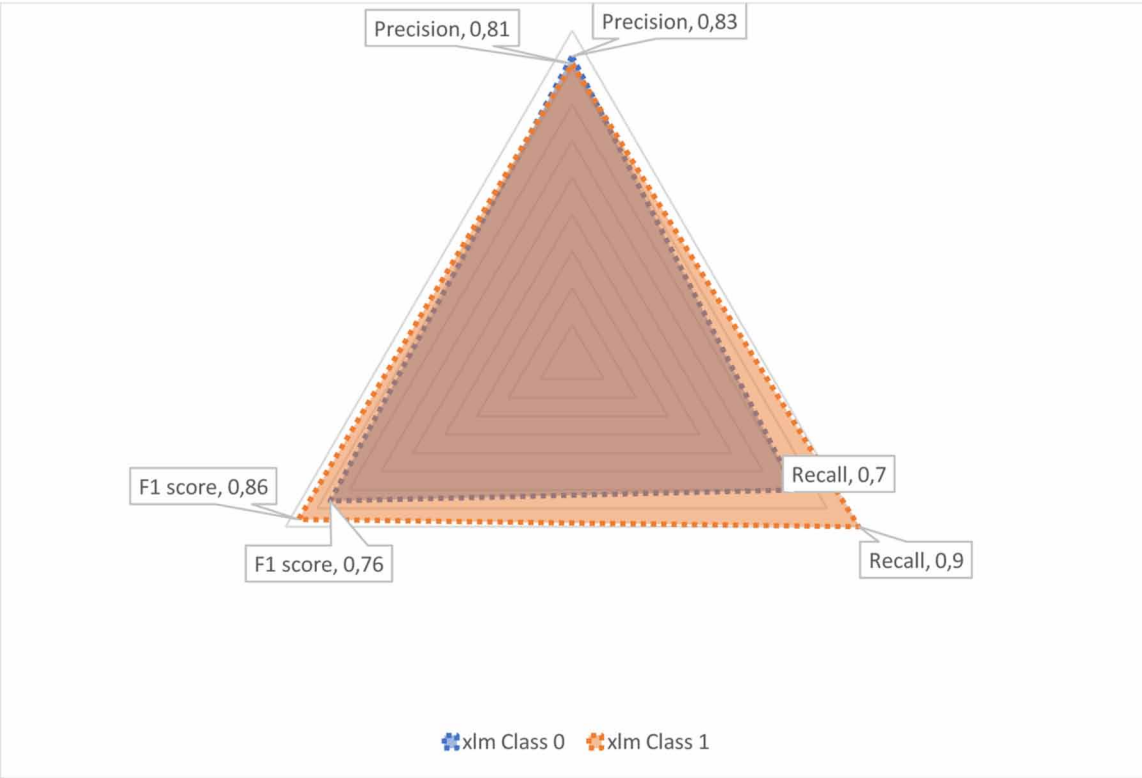
prediction they seek to make. For this work, the logistic regression models Random Forest, XGBoost, and ELM were used. According to the references identified in the theoretical framework, the authors' opinion represents the alternatives with the highest probability of obtaining good results.

Secondly, there are aspects related to performance measures. However, a large part of them is derived from the confusion matrix; an analysis of the problem that is being analyzed must be carried out to understand the performance measure that it offers a better interpretation of the results. Based on the previous definition of classes 0 and 1 for the result variable, the prediction of the renewal or not of the commercial register is an essential basis for analyzing performance measures. In some instances, it is more important in terms of results to focus on the true positives, as in this research, and in other cases on the false positives, so the classes help to direct this analysis.

In the same sense, measures such as precision, recall, and F1 score were determined from the classes. This allows individualizing the prediction for each class. For the present work, it was of greater interest to know the performance for class 1 since it represented the renewal of the commercial register. In this aspect, the XGBoost model offered the best performance in class 1, followed by the Random Forest model. Finally, there were those of logistic regression and ELM. Despite this, the results of all the models were above 0.8, which represents an important performance in the prediction offered.

From the previously discussed aspect, the global performance measures of the models are also highlighted, and in this point, reference is made to the accuracy and ROC-AUC. These measures are not determined from the classes, so they offer a general perspective of the model's performance. In the

Figure 5. Measures of precision, recall and f1 Score of the XLM model for classes 0 and 1
Source: The authors

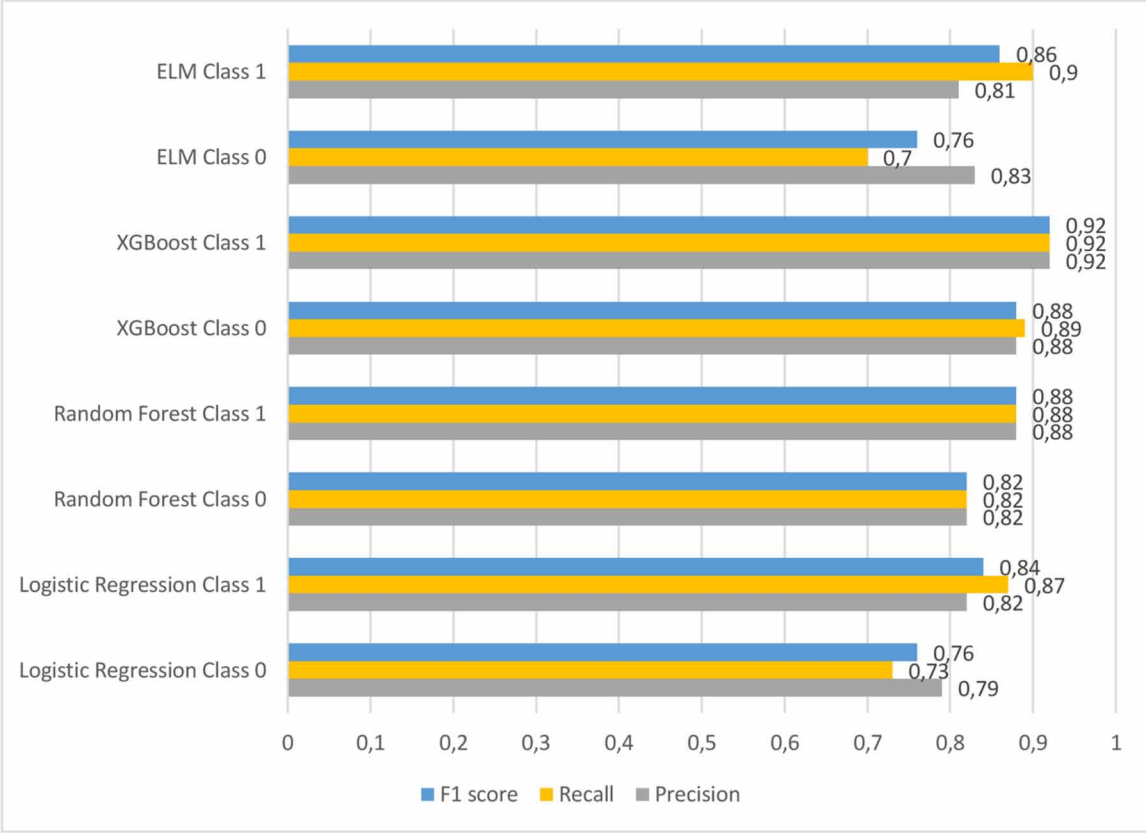


particular case, the XGBoost with an accuracy of 0.9 and a ROC-AUC of 0.97 represents the best performances obtained, followed by this is the model with Random Forest and later there were those of the logistic regression and the ELM, which had a homogeneous behavior with performance analysis by class.

Regarding the results of the performance measures, another important aspect is the optimization of the parameters of the models because, with the default parameters, predictions with lower performances would be achieved, for which the cross-validation contributes substantially to improving forecasting performance.

Third, about the prediction of the renewal of the commercial register of companies with a ROC-AUC measure of 0.97 provided by the XGBoost model, it is important information for entities seeking to promote formalization of business activity in Bogota. Based on the results obtained from this research, they can direct their efforts to companies that are less likely to renew their commercial registration and establish support lines that allow them to continue operating within a legal framework. It is also important for entrepreneurs when determining the probability of renewing their commercial registry from the variables exposed in this research. Early measures can be taken that aim to generate changes in the values of the variables analyzed and increase the probability of renewal of their registrations. Therefore, they continue in the development of the activities of their corporate purpose.

Figure 6. Comparative of measures of precision, recall and f1 Score for classes 0 and 1
Source: The authors



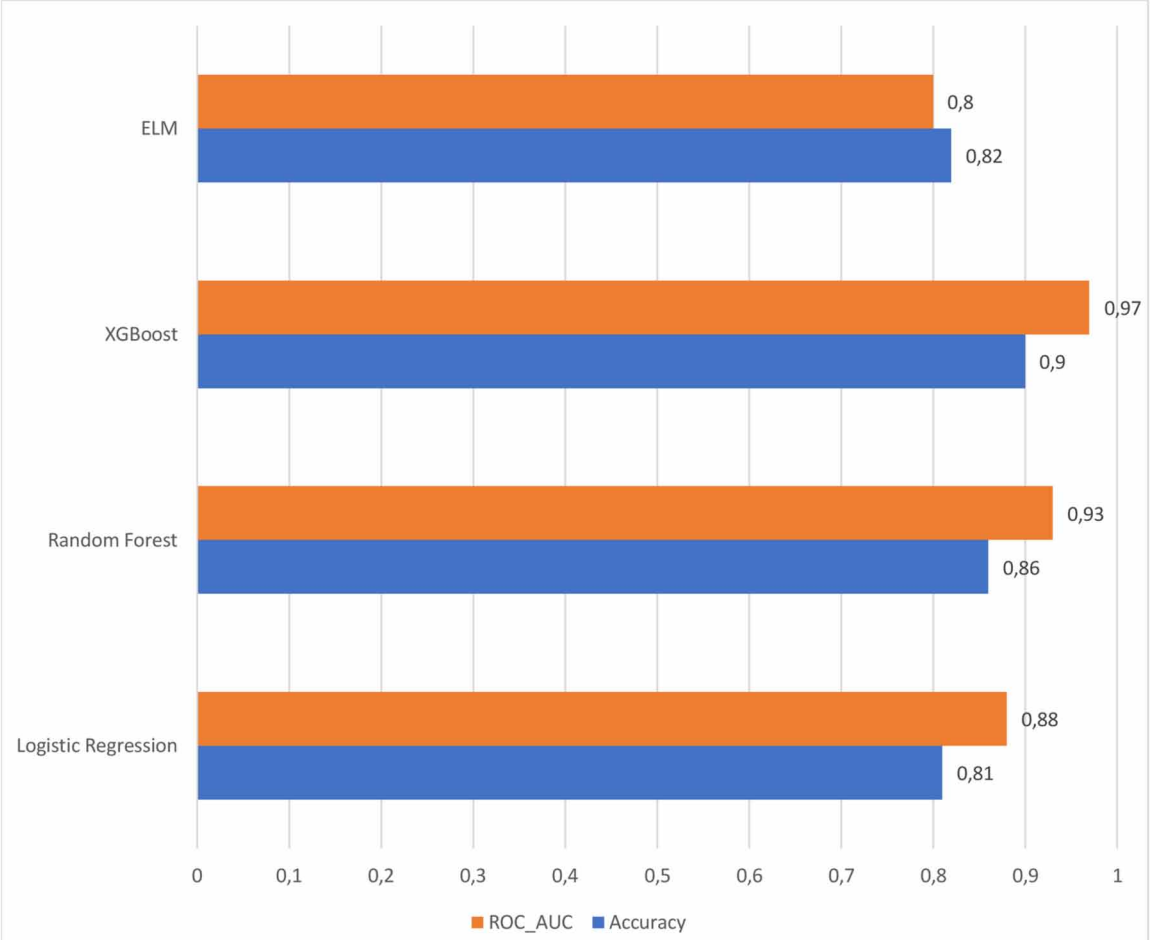
FUTURE RESEARCH DIRECTIONS

One of the most relevant results of this work is the model to predict whether a company will renew its commercial registry or not, based on public information. However, the dataset used in this research could not have all the variables that explain this phenomenon. For instance, in 2018, according to a report delivered by the Superintendency of Corporations in Colombia, the three foremost reasons for the companies' bankruptcy were the country's economic situation linked to the perception of instability, the high tax burden, and the unfair competition. This brings up a question about whether all the companies that do not renew their registry are necessarily in bankruptcy or are planning to close. On the other hand, considering the causes previously named, the challenge for future studies will be around how these variables could be measured.

Although the dataset used is the available information in the source cited, other sources could get different or complementary data even to compare the performance model's proposed against others, for instance, insolvency models.

Another point is that the covid-19 pandemic set up a new condition across the board, as it is highly likely to have implications for the companies and their management. For this reason, a comparison study about the effect of the outbreak would allow identifying crucial variables which could be relevant in

Figure 7. Comparative of measures of accuracy y ROC-AUC
Source: The authors



making decisions, as we saw in 2020, primarily, many small businesses required help from government programs to stay afloat, even large companies reported financial problems where, in many cases, the direct consequence was the job losses. Though several measures were implemented, closure of companies was inevitable; hence, in consideration of this frame, future work can reveal the condition in this period.

To sum up, this research is a contribution to understanding the reasons to lead the companies to close and put up information to decrease the numbers. Further, taking into account the active period of a company and its consolidation into a dataset enables a model to assess the operative time of companies and characterize themselves.

CONCLUSION

All in all, the conclusions are raised from the following perspectives; compared to the descriptive analysis, it was possible to observe in the first instance that linked to the number of renewals, the number of

cancellations of the commercial register represents an important value. Taken as a reference to the year 2019, which was the year in which the numbers of renewals and cancellations had an almost negligible difference, cancellations represented 41.57% of the total records studied. This allows us to identify that even though most companies renew their registration, many organizations cannot continue operating, which shows the need to develop more research to offer knowledge that contributes to reducing the number of cancellations.

There is a solid representation of natural persons regarding the legal organization, with 52.94% of the total records studied. This could suggest that the formalization of commercial activity in Colombia is not very oriented towards the establishment of companies. Instead, people seek to comply with the legal operation requirements, and they resort to registering as natural persons, which would neglect to consider aspects of the business vision. There is a high concentration in micro and small companies in the category of company size, representing 95.08% of the total records analyzed. This factor shows the level of business development in Bogota, which has a dynamic driven by a significant number of small players, with very little presence of large companies. This aspect is related to the distribution according to the legal organization if it is considered that a large part of the micro-enterprises reported as natural persons.

Regarding the sectors, little development of the productive apparatus in Bogota can be inferred, given that only 16.57% of the total records are found in the industrial sector. At the same time, more concentration of the mercantile dynamics can be observed in the services and commerce sectors, which together represent 72.56% of the total records studied. Concerning the analysis of the quantitative variables related to the values of the number of establishments, staff employed, values of assets, liabilities, equity, and sales, high dispersion of the values is observed, which can be identified in the overall values of the range the deviation and variance. In this sense, the distribution of said variables is observed in a subdivision of discrete and continuous, the discrete ones relating to the number of establishments, staff employed and the continuous ones to the other variables mentioned above.

From the perspective of the models built, It can be observed that the predictions of class 0 have lower performances than the predictions of class 1. This indicates that the model's better performance predicts companies that renew their commercial registration than those that cancel it. In this sense, the most remarkable difference in performance measures between classes is found in the recall, in which class 0 obtained 0.73. In contrast, class 1 obtained 0.87. This measure is significant since it shows the ratio between the number of correct results and the results that should have been considered correct. Despite this, the performances in the two classes are not less than 0.7, which shows a good performance of the model.

In the second model, built with random forest, a higher level can be observed in the performance measures by classes compared to the one built with logistic regression with results higher than 0.8. In this case, the prediction of class 1 also behaves similarly. Compared to class 0, however, the difference in measurements is not that wide, standing at 0.06 in the precision, recall, and F1 score measurements. This model also better predicts renewal than a cancellation of business records. In the third model, the XGBoost was used; this model presented the same tendency to predict renewals more accurately than the commercial register's cancellations. It is noteworthy that it showed a narrower distance between the predictions by class, with 0.04 being the most considerable difference for the precision measures and F1 score.

In the fourth model, ELM was used; in this case, there were very homogeneous performances in the predictions by classes, with 0.1 being the most significant difference in the recall and F1 score perfor-

mance measures. However, this model also better-predicted renewals than cancellations. As a common denominator in the models analyzed according to their performance measures by class, an orientation maraca was observed.

In general terms, we were able to establish the models proposed to predict the cancellation of the commercial register and, therefore, the disappearance of its operation in the market, or at least of its operation according to Colombian legal norms. As previously stated, it offers information valuable to direct public efforts. We deprive ourselves of preserving the largest number of organizations contributing to Bogota's economic dynamics.

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Son, H., Hyun, C., Phan, D., & Hwang, H. J. (2019). *Data analytic approach for bankruptcy prediction*. Expert Sytems With Applications. doi:10.1016/j.eswa.2019.07.033

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Chapter 12
Project Management Tools and Techniques to Deal With Disruptive Situations in Projects:
An Applied Research in the Colombian Context

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ABSTRACT

This research work aims to analyze how project management tools and techniques help project managers to deal the disruption in projects in the Colombian business context. Firstly, a detailed literature review about project management and disruption was conducted. Secondly, a comprehensive scientometric analysis of project management and disruptive situations on this kind of endeavor was undertaken. Thirdly, tools and techniques suitable for handling disruptive situations on projects were identified. Fourthly, an extensive fieldwork over 700 organizations from the Colombian organizational context was executed. Fifthly, a detailed statistical analysis was carried out to determinate how project management tools and techniques contribute to handle disruption on this kind of initiatives. And finally, research findings were documented, a positive effect of the use of project management tools and techniques to face disruptive situations on project was found, conclusions were set, and future lines of research were defined.

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INTRODUCTION

On the literature review, some researchers had study project management and disruptive situations on this kind of endeavors mainly from a theoretical perspective, based on unique cases of study far way form the reality of projects in Colombia. The objective of this is research work in to analyze how project management tools and techniques help project managers to deal the disruption in projects.

This applied research, proposes a model to face disruption in projects by implementing suitable tools and techniques in order to improve project's performance, increase value creation for hosting organizations, and align projects in a proper way with corporate strategies in the Colombian context.

This chapter makes a significant contribution to the project management discipline in the country, by addressing, scientifically, the way project managers, key stakeholders, and hosting organizations, may face unwanted effects of disruption in projects, by deploying proven project management tools and techniques, in a comprehensive approach, in order to improve the management of this kind of endeavors performed by organizations from the Colombian context.

BACKGROUND

Disruption in project management, is a topic of research that had been increasing its appearance on the scientific literature on resent years ((Scopus, 2021) and Web of Science (WOS, 2021), in order to identify the suitable project management tools and techniques to deal with disruptive situations on this kind of endeavors, it is required to conduct a details literature review on this regard.

Initially, key terms on the matter of research were defined. Latter, a detailed scientometric analysis was conducted on main bibliometric tools by including, as a search topic, the terms disruption and project management.

Definitions of Disruption on Project Management

Disruptive situations are common in projects. This term can be defined as something "new and original, in a way that causes major changes to how something is done" (Oxford, 2021). Other definition of disruptive is "causing, tending to cause, or caused by disruption; disrupting: the disruptive effect of their rioting" (Thesaurus, 2021).

Uncertainty, change, unpredictability, complexity, and risks emerge as some of the aspects related to disruptive conditions that must be addressed by project managers in order to fulfill project objectives, create value for the hosting organization and related stakeholders, and align projects whit corporate strategies (Rincón-González, 2020).

Uncertainty is described as the "lack of knowledge or understanding of an issue, event, way to follow, or a solution to find. Uncertainty "can increase or amplify issues, risks, behaviors or situations internal or external to a project or program" (PMI, 2014, p. 97).

Change is a "modification to any formally controlled deliverable, project management plan component or project document (PMI, 2017, p. 700). Unpredictability relates to "a typical result of a project or program in a complex environment. Social and political interactions can create issues or results that are impossible to predict" (PMI, 2014, p. 97).

Complexity is defined as "a characteristic of a project or program or its context, which indicates the management difficulty because of human or system behaviors and ambiguity" (PMI, 2014, p. 93). And risk is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives (PMI, 2019). All al the above definitions relate to the effect of disruption on project's objectives.

Other terms such as unmanageable, uncontrollable, out of control, unrestrained and unsettling or upsetting, arise as synonymous of disruptive situations (Oxford, 2021), all applicable in the context of projects, as elements that causes trouble of confusion to related project stakeholders (Thesaurus, 2021).

Project management is "the application of knowledge, skills, tools and techniques to project activities to meet the project requirements" (PMI, 2017, p. 716). Therefore, this discipline involves dealing whit disruption in order to achieve project's goals.

Tools and techniques, as part of a defined project management methodology, are designed to solve situations that may occur on a given project, included those of a disruptive nature.

On one hand, a tool is defined as "something tangible, such as a template or a software program used in performing an activity to produce a product or result" (PMI, 2017, p. 725). On the other hand, a technique is defined as "a systematic procedure employed by a human resource to perform an activity to produce a product or result to deliver a service, and that may employ one or more tools" (PMI, 2017, p. 724). As a result, the combination of tools and techniques, as part of a project management methodology, set a proper path to face disruption in projects, and improve the management of this kind of initiatives.

As a consequence, it is required to analyze, from a scientific perspective, the effect of project management tools and techniques, when dealing with disruptive situations in this kind of endeavors, in order to define a suitable approach to enhance project performance and achieve project objectives, instead of placing an empirical approach based on test and error, compromising project capacity to achieve business goals.

Scientometric Analysis of Disruption on Project Management

A detailed scientometric analysis about disruption and project management was conducted. Main topics, key authors, principal publications, top subgroups of research, and countries and organizations leading contributions on this matter of study were identified.

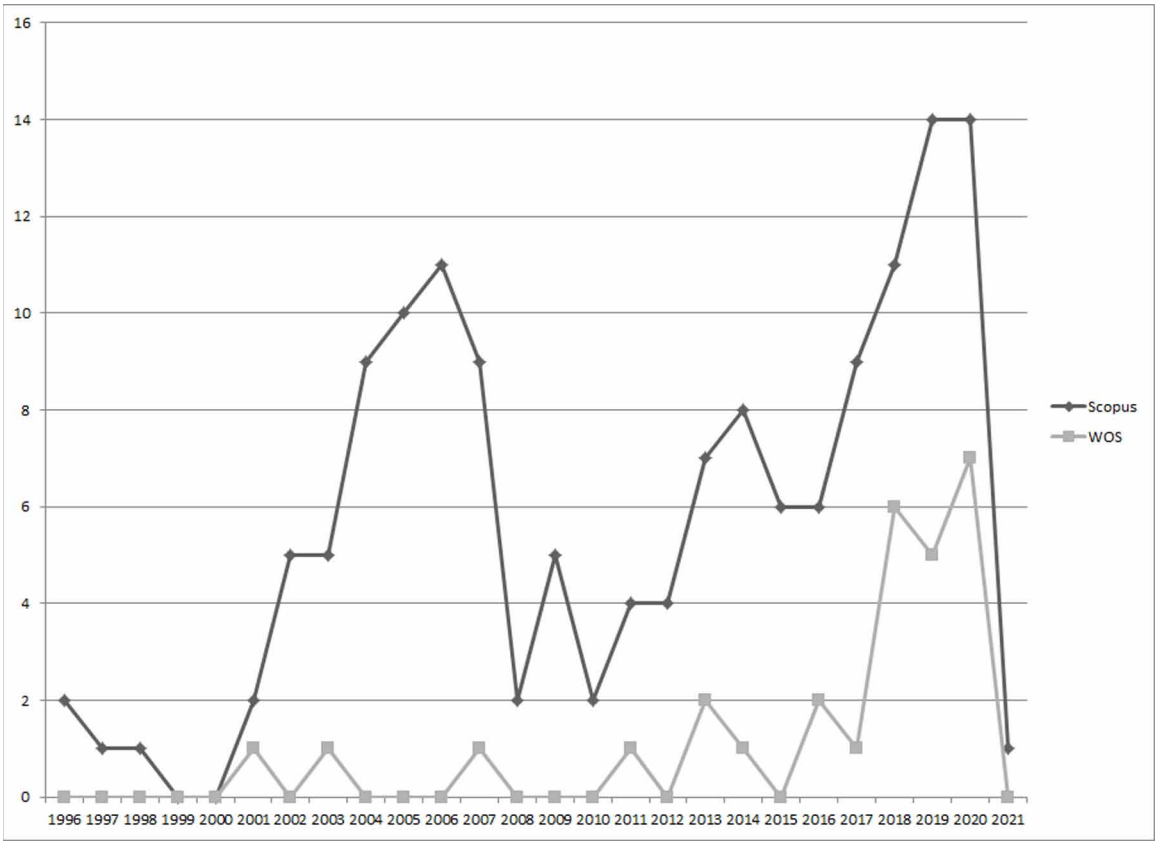
176 scientific publications, on main bibliometric tools Scopus (2021) and WOS (2021), about project management and disruption, were identified on the period between 1996 and 2021 as sowed on Figure 1. First publications on this matter of study appeared on Scopus on 1996, 5 years later, WOS presented articles on this regard. From 2012, both Scopus and WOS, showed a significant increase in the number of published documents. This remarks the importance of the study of disruption on project management as a scientific topic of research.

Main Topics of Research of Disruption on Project Management

A bibliometric analysis of main topics of research about disruption and project management was conducted. Scopus and WOS, showed keywords used on the publications about disruption and its effect on project management as presented on Figure 2.

As most significant terms on the research about project management and disruption appeared: (a.) construction industry, (b.) decision making, (c.) risk management, (d.) societies and institutions, (e.)

Figure 1. Publications per year about disruption on project management - Scopus and WOS (1996-2021)
Source: The authors on VOSviewer from Scopus (2021) and WOS (2021)



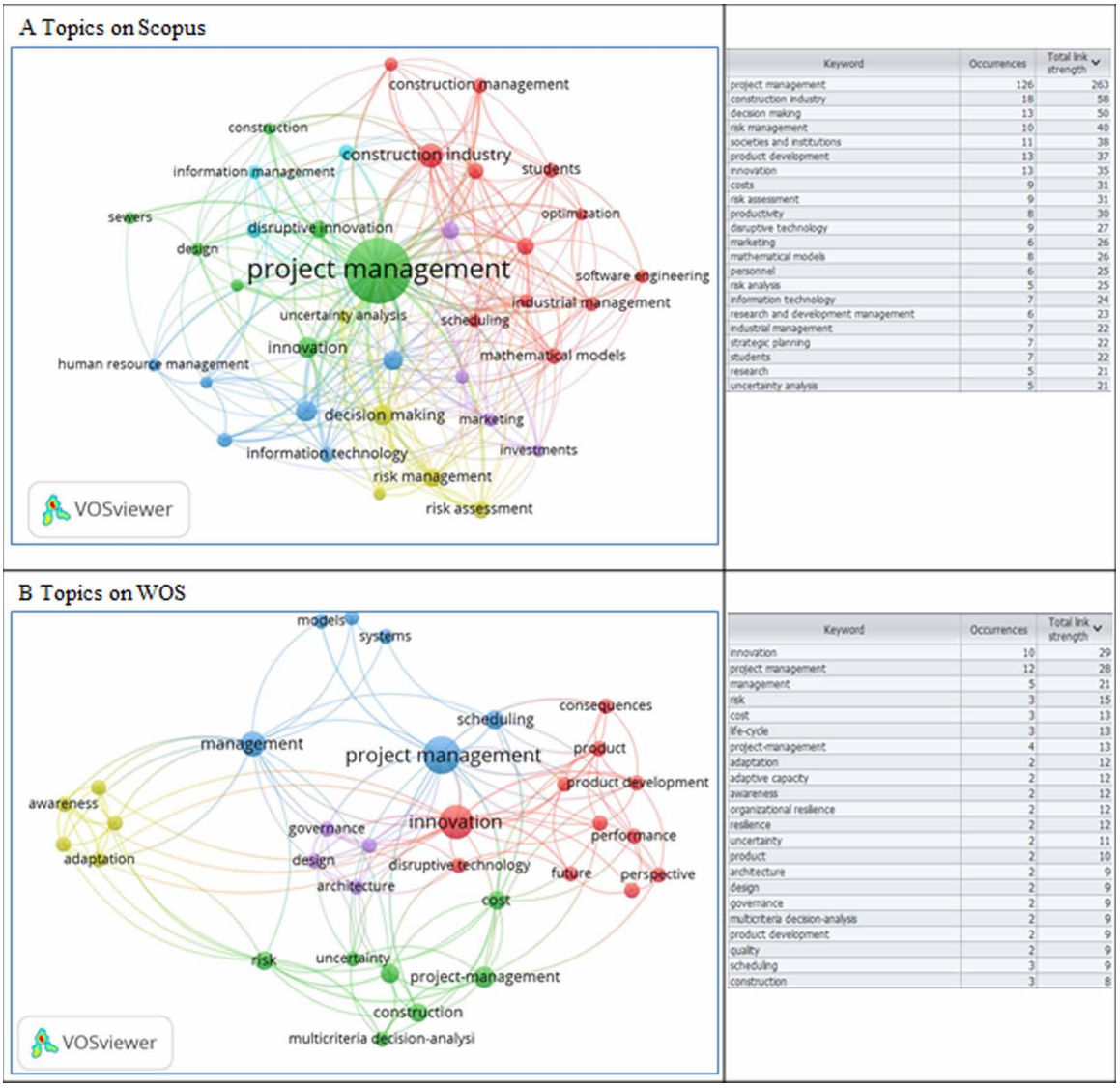
product development, (f.) innovation, (g.) cost, (h.) risk assessment, (i.) productivity, (j.) management, (k.) life-cycle, (l.) adaptation, (m.) awareness, (n.) organizational resilience, and (o.) uncertainty. These terms were taken into account to define variables of study.

Key Authors of Research of Disruption on Project Management

A bibliometric analysis of main contributors of the disruption on project management was conducted. The bibliometric tools used on this study, showed researchers working on understanding the way disruption affects project management as presented on Figure 3.

As most significant authors on the research about project management and disruption showed up: (a.) Doherty K., (b.) Kelder J., (c.) King C., (d.) McInerney F., (e.) Phillips R., (f.) Robinson A., (g.) Vickers J., (h.) Walls J., (i.) Angeloudis P., (j.) Aurisicchio M., (k.) Bernard C., (l.) Dawande M., (m.) Ferguson R., (n.) Hsu P., (o.) Leidig J., (p.) Leidig P. (q.) Mookerjee V., (r.) Williams M., (s.) Xia H., (t.) Collier Z., (u.) Lambert J., and (v.) Rahi K.

Figure 2. Main topics of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)

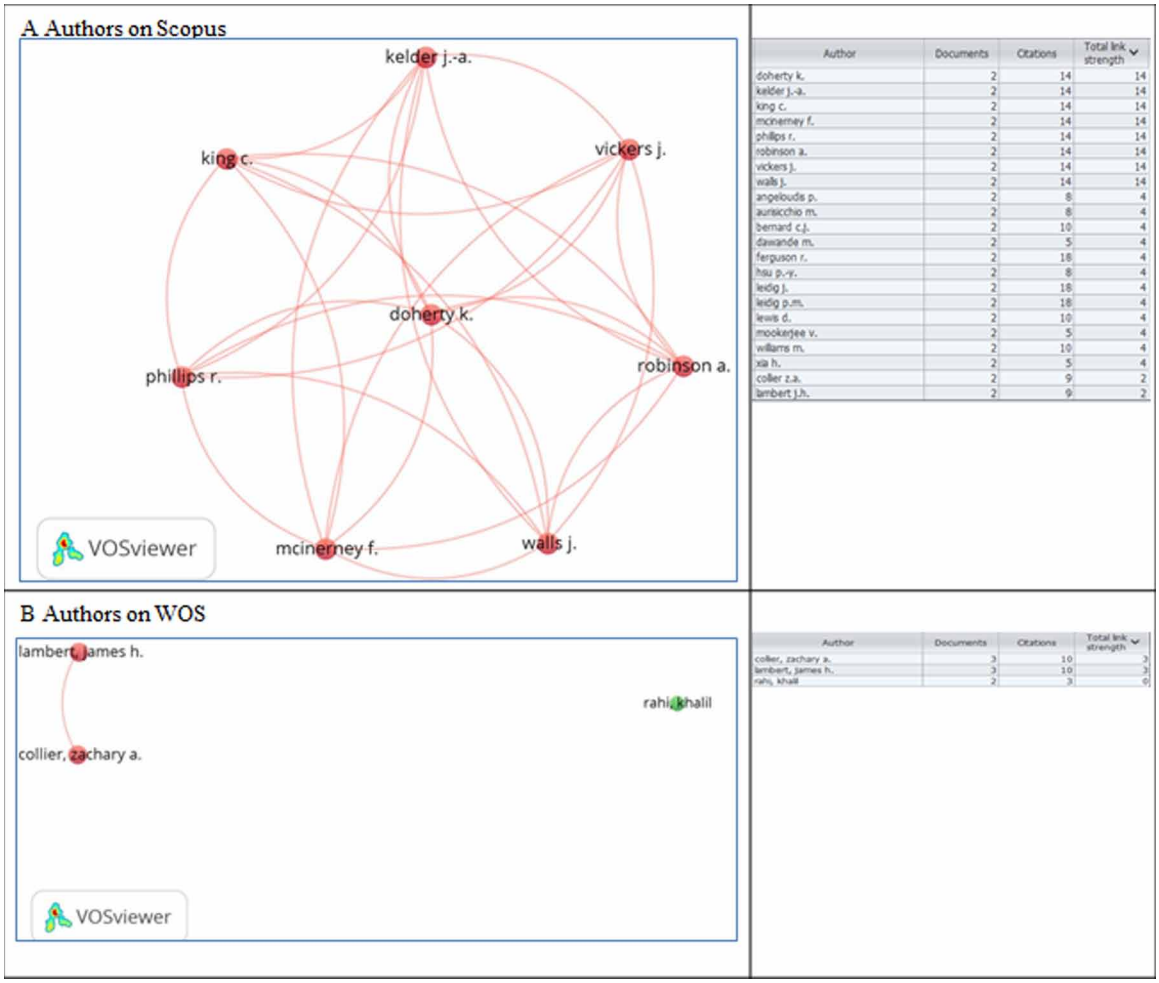


Principal Publications of Research of Disruption on Project Management

A bibliometric analysis of top sources on the research about disruption on project management was directed. Scopus and WOS, showed sources publishing articles on the way disruption affects project as illustrated on Figure 4.

As most influencing sources on the research about project management and disruption appeared: (a.) Engineering, construction and architectural management, (b.) Journal of construction engineering and management, (c.) Procedia computer science, (d.) ASCE - ASME journal of risk and uncertainty in engineering systems part, (e.) IEEE systems journal, (f.) IEEE international engineering management conference, (g.) International journal of project management, (h.) Lecture notes in computer science, (i.)

Figure 3. Key authors of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)



Proceedings of the ASCE pipeline division specialty congress - pipeline engineering and construction, (j.) Project management journal, and (k.) Sustainability (Switzerland).

Top Subgroups of Research of Disruption on Project Management

A bibliometric analysis of top subgroups of research about disruption and project management was conducted. The bibliometric tools, showed aggregations used to group publications about disruption and its effect on project management as presented on Figure 5.

As top subgroups on the research about project management and disruption emerged: (a.) Engineering, (b.) Business, Management and Accounting, (c.) Computer Science, (d.) Social Sciences, (e.) Environmental Science, (f.) Decision Sciences, and (g.) Operations research management science. This implies that disruption on project had been studied mainly from the engineering, business and science perspective.

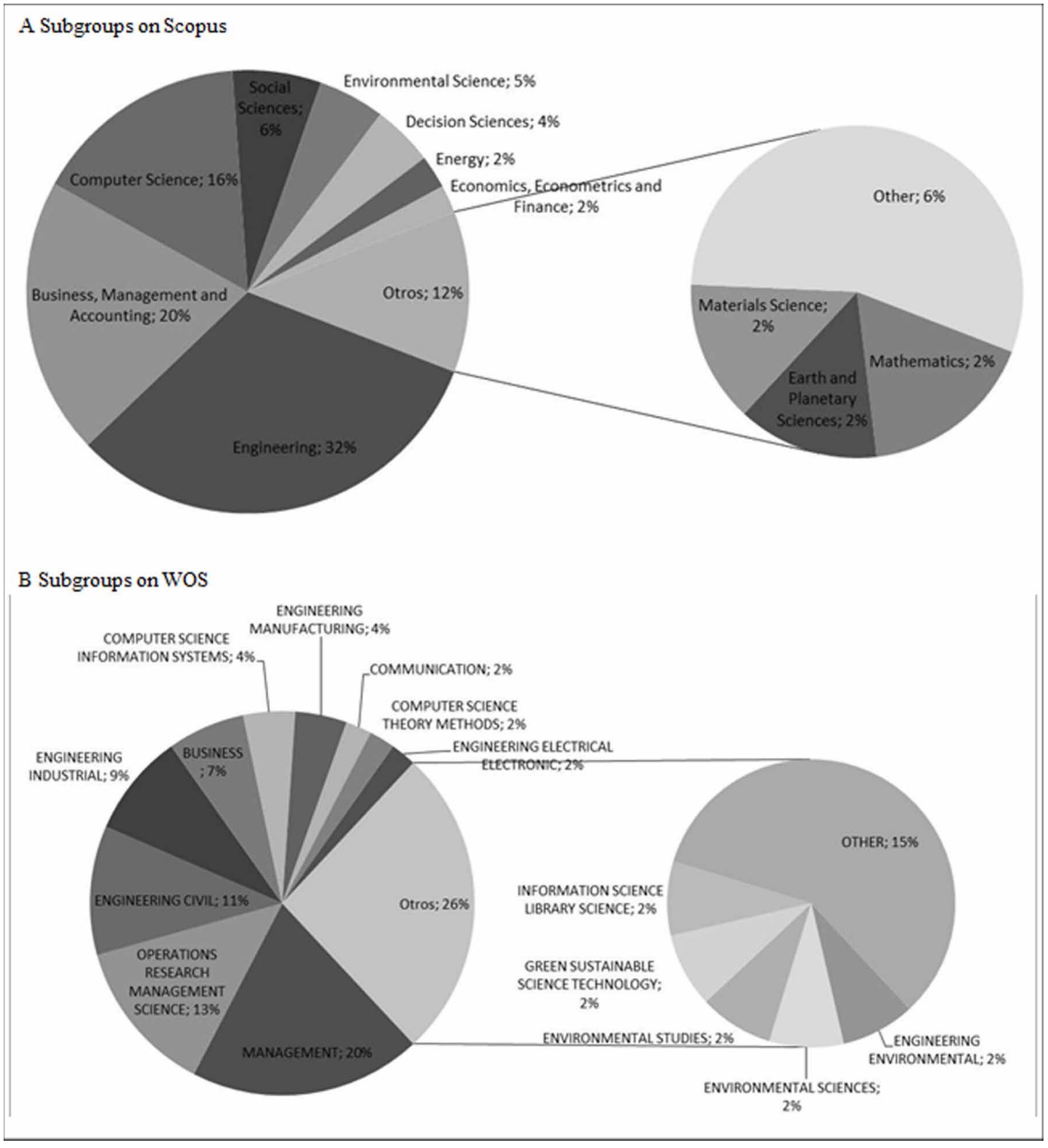
Figure 4. Principal publications of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)

Leading Counties on the Research of Disruption on Project Management

The bibliometric tools, presented countries leading the publications on the research about disruption and project management, as illustrated on Figure 6.

As countries leading the research about project management and disruption, emerged: (a.) Australia, (b.) Canada, (c.) China, (d.) France, (e.) Germany, (f.) Italy, (g.) Norway, (h.) United Kingdom, (i.) United States, (j.) Brazil, and (k.) England.

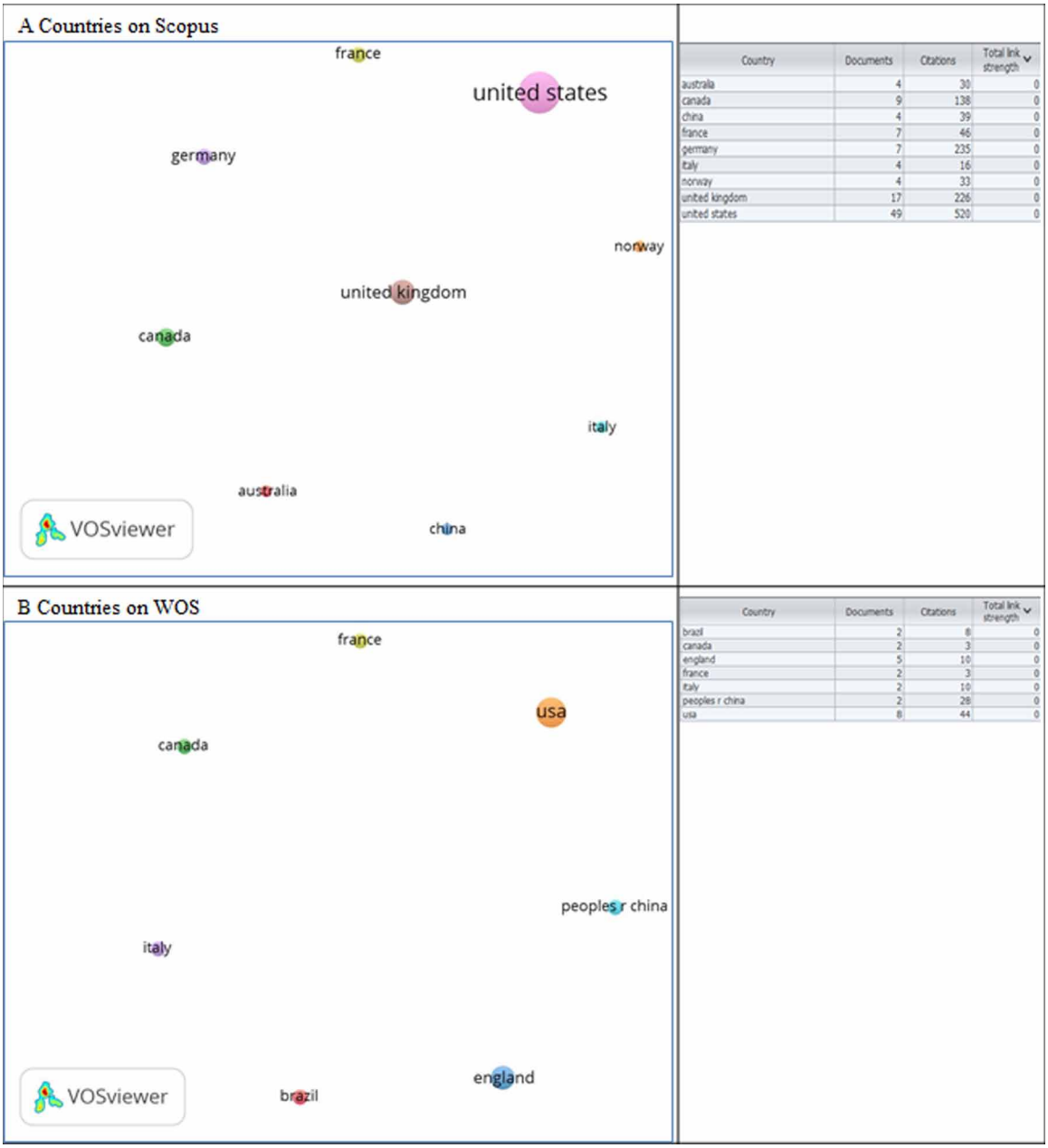
Figure 5. Top subgroups of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)



Leading Organizations of Research of Disruption on Project Management

As seeking on the terms disruption and project management on Scoups and WOS, organizations heading the research on this regard, are those presented on Figure 7.

Figure 6. Leading counties on the of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)



Organizations worldwide that lead the research about disruption and project management are: (a.) University of Virginia, (b.) Commonwealth Ctr adv Logist Systems, (c.) Port Virginia, (d.) ASCE, United States, (e.) Halliburton energy services, inc., United States, (f.) Murdoch University, Perth, Australia, (g.)

Naveen Jindal school of management, University of Texas at Dallas, United States, (h.) Sages solutions llc, (i.) University of Johannesburg, South Africa, (j.) Aalborg University, Bi Norwegian Business School, (k.) Cambridge Judge Business School, CRN Imati, (l.) Duke University, Ecole Polytechnic Montreal,

(m.) Fore School of Management, (n.) Free University of Berlin, (o.) Harbin Institute of Technology, (p.) Hong Kong Polytechnic University, and (q.) Imperial College of London.

Figure 7. Leading organizations on the of research
Source: The authors on VosViewer from Scopus (2021) and WOS (2021)

Organization	Documents	Citations	Total link strength
asce, united states	2	96	0
halliburton energy services, inc., u...	2	10	0
murdoch university, perth, australia	2	14	0
naveen jindal school of managem...	2	5	0
sages solutions llc	2	10	0
university of johannesburg, south ...	2	0	0
wicking dementia research and ed...	2	14	0

Organization	Documents	Citations	Total link strength
univ virginia	3	10	2
commonwealth ctr adv logist syst	1	3	1
port virginia	1	3	1
aalborg univ	1	19	0
bi norwegian business sch	1	3	0
cambridge judge business sch	1	3	0
cnr imati	1	10	0
duke univ	1	10	0
ecole polytech	1	0	0
ecole polytech montreal	1	3	0
fore sch management	1	1	0
free univ berlin	1	112	0
harbin inst technol	1	5	0
hong kong polytech univ	1	23	0
imperial coll london	1	0	0
ind bebidas nutraceut spa	1	0	0
insead fontainebleau	1	3	0
ipm	1	1	0
jku johannes kepler univ linz	1	1	0
leeds metropolitan univ	1	5	0
loughborough univ	1	0	0
michigan technol univ	1	14	0

Summary of Scientometric Analysis of Disruption on Project Management

In summary, the scientometric analysis of disruption and project management, covering: main topics, key authors, relevant sources, main subgroups of research, leading counties and organizations, can be seen on Table 1.

MAIN FOCUS OF THE CHAPTER

The focus of this chapter, is to analyze disruption in the context of projects, and later, propose a model of project management tools and techniques in order to face disruptive situations on this kind of endeavors, so as to improve project's performance, increase value creation for hosting organizations, and align projects in a proper way with corporate strategies, in the Colombian context.

Problem of Research

The lack of applied researches on the matter of disruptive situations in projects, in the Colombian business context, makes relevant to define a model of project management tools and techniques in order to deal with disruption, and consequently, to improve the performance of this kind of endeavors conducted by organizations in the country.

Research works conducted in other geographical contexts, are far away from the reality of the endeavors executed by organizations in the country, and do not approach the way disruptive situations affect project performance in Colombia.

The project management tools and techniques identified on the literature review, were proven as suitable to face disruption, later incorporated in to a model, and afterwards applied on a sample of projects nationwide, to analyze the way organizations deal with disruptive situations in Colombia. The results of this research contribute to the discipline of project management in the country by addressing, scientifically, how to deal with disruption in projects.

Methodology of Research

The methodology of research used on this investigation, involved a detailed scientometric analysis of 176 scientific publications on main bibliometric tools, related to disruption on the context of projects; topics of research, key authors, main sources, subgroups of publications, leading countries and organizations, were identified. Latter, variables of study were defined, and incorporated into an information gathering instrument. Afterwards, and extensive fieldwork, covering 702 organizations that conduct projects nationwide, was deployed by semi structured interviews and surveys with project managers, project sponsors and/or PMOs from the studied organizations, that were selected randomly. Subsequently, a detailed statistical analysis was conducted, with high confidence levels, in order to determinate the behavior of organizations when dealing with disruptive situations in projects in Colombia, clusters to group the studied organizations, according to the way they deal with disruption were established. And finally, results of the research were documented, a model of tools and techniques to face disruptive situations in projects was proposed, concoctions were defined, and future lines of research were established.

Table 1. Summary of scientometric analysis of disruption on project management

Key topics of research	Principal authors	Sources with most citations and references
(a.) Construction industry, (b.) decision making, (c.) risk management, (d.) societies and institutions, (e.) product development, (f.) innovation, (g.) cost, (h.) risk assessment, (i.) productivity, (j.) management, (k.) life-cycle, (l.) adaptation, (m.) awareness, (n.) organizational resilience, and (o.) uncertainty.	(a.) Doherty K., (b.) Kelder J., (c.) King C., (d.) McInerney F., (e.) Phillips R., (f.) Robinson A., (g.) Vickers J., (h.) Walls J., (i.) Angeloudis P., (j.) Aurisicchio M., (k.) Bernard C., (l.) Dawande M., (m.) Ferguson R., (n.) Hsu P., (o.) Leidig J., (p.) Leidig P. (q.) Mookerjee V., (r.) Williams M., (s.) Xia H., (t.) Collier Z., (u.) Lambert J., and (v.) Rahi K.	(a.) Engineering, construction and architectural management, (b.) Journal of construction engineering and management, (c.) Procedia computer science, (d.) ASCE - ASME journal of risk and uncertainty in engineering systems part, (e.) IEEE systems journal, (f.) IEEE international engineering management conference, (g.) International journal of project management, (h.) Lecture notes in computer science, (i.) Proceedings of the ASCE pipeline division specialty congress - pipeline engineering and construction, (j.) Project management journal, and (k.) Sustainability (Switzerland).
Top subgroups of research	**Countries**	**Organizations**
(a.) Engineering, (b.) Business, Management and Accounting, (c.) Computer Science, (d.) Social Sciences, (e.) Environmental Science, (f.) Decision Sciences, and (g.) Operations research management science.	(a.) Australia, (b.) Canada, (c.) China, (d.) France, (e.) Germany, (f.) Italy, (g.) Norway, (h.) United Kingdom, (i.) United States, (j.) Brazil, and (k.) England.	(a.) University of Virginia, (b.) Commonwealth Ctr adv Logist Systems, (c.) Port Virginia, (d.) ASCE, United States, (e.) Halliburton energy services, inc., United States, (f.) Murdoch University, Perth, Australia, (g.) Naveen Jindal school of management, University of Texas at Dallas, United States, (h.) Sages solutions llc, (i.) University of Johannesburg, South Africa, (j.) Aalborg University, Bi Norwegian Business School, (k.) Cambridge Judge Business School, CRN Imati, (l.) Duke University, Ecole Polytechnic Montreal, (m.) Fore School of Management, (n.) Free University of Berlin, (o.) Harbin Institute of Technology, (p.) Hong Kong Polytechnic University, and (q.) Imperial College of London.
Main publications		
Alburquenque Morales, A. (2020); Boas Viveiros Lopes, Kissimoto, Salerno, de Carvalho & Barbin Laurindo (2016); Bon (2020); Castro-Leon (2014); Chan (2020); Collier & Lambert (2018); Collier & Lambert (2019); Collier, Hendrickson, Polmateer & Lambert (2018); Dobre & Sorin Dragomir (2017); Feinbuam (2004); Gahagan, & Herrmann (2007); Grosse (2016); Haddara & Staaby (2018); Hsu, Aurisicchio & Angeloudis (2017); Hsu, Aurisicchio, Angeloudis & Whyte (2020); Iamratanakul & Kocaoglu (2006); Ismail, Bandi & Maaz (2018); Jinasena, Spanaki, Papadopoulos & Balta (2020); King, Kelder, Doherty, Phillips, McInerney, Walls & Vickers (2014); King, Kelder, Phillips, McInerney, Doherty, Walls, & Vickers (2013); Klastorin & Mitchell (2013); Leidig, Ferguson & Leidig (2006); Ma, Xiong, Olawumi, Dong & Chan (2018); MacInnes (2005); McLoone (2009); Midler (2019); Mukhopadhyay, Repetto, Luez & Chatelard (2006); Nguyen, Kneppers, García De Soto & Ibbs (2010); Orstavik (2014); Palomo, Rios Insua & Ruggeri (2007); Panneerselvam, Smith, Coker, Kunay, Nishimoto, Neathery & Carpenter (2019); Perides, de Vasconcellos & Vasconcellos (2020); Rahi (2019 a); Rahi (2019 b); Rechard & Tierney (2005); Rockström, Andersson, Erixon & Lindblad (2006); Sakamoto (2018); Sharma & Kumar (2020); Smit, Bond-Barnard, Steyn & Fabris-Rotelli (2017); Sommer, Dukovska-Popovska & Steger-Jensen (2014); Tang, Cass & Mukherjee (2013); van Oorschot, Sengupta & Van Wassenhove (2018); Villar-Fidalgo, Espinosa Escudero & Domínguez Somonte (2019); Williams, Lewis & Bernard (2004); Williams, Ackermann & Eden (2003); Willis & McKie (2011); Windeler & Sydow (2001); and Xia, Dawande & Mookerjee (2016).		

Source: The authors with Scopus (2021) and WOS (2021)

Proposed Model

Key topics of research documented on Table 1, were used as a base to define variables of study (Scheduling (T Total), Costs (C Total), Quality (Q Total), Personnel (RE 3), Human resource management (RE Total), Uncertainty analysis (RI 2), Risk assessment / Risk analysis (RI 4), Resilience (RI 5), Risk management (RI Total), Performance (I 3), Multicriteria decision-analysis (I 3), Success factors (I 3), Management (I 4), Life-cycle (I 5), Innovation (O 1), Investments (O 1), Strategic planning (O 2), Governance (O 4), Mathematical models (O 9), Information technology (O 9), Research and development management (O 9), Information management (O9), Information systems (O 9), Models (O 9), Systems (O 9), Optimization (O 10), and Project management (PM Total)), to analyze the way organizations in Colombia face disruptive situations in projects. Those elements were included into the proposed model presented on Table 2.

Variables of study describe on Table 2, were included into the information gathering instrument, and grouped on categories as presented on Figure 8. On one hand, triple constrain elements (T Total, C Total, and Q Total) emerged same as resources (RE 3 and RE T), and tools and techniques related to the management of other sources of disruption management (I 3, I 4, and I 5) and (O 1, O 2, O 4, O 9, and O 10). On the other hand, risk management emerged as key element to face disruptive situations in project by dealing with uncertainty and ambiguity (RI 2, RI 4, RI 5, and RI Total). The instrument, with the variables of study, was applied on the sample organizations, projects manager, sponsors and/or PMOs were consulted about the way the elements of the proposed model helped their organizations to manage the effects of disruption when executing projects, the measurement of the fieldwork were presented on Figure 9 as part of the results of this research work.

Results

A statistical sample was defined in order to reflect a representative view of Colombian organizations oriented to projects, the sampling method was simple random in order to assure that each organization of the study had the same probability of been selected. The size of the sample end up to 702 organizations, enough to assure the assumption of normality needed to provide robust results of the conducted statistical analyses. The information collection instrument applied remotely included a section for demographic data, another section identify the project management practices within the organization, and a last one to inquire about the way studied organizations face disruptive events in projects.

The authors of this research considered important to reduce the number of variables included into the information collection instrument, therefore a Principal Components Analysis (PCA) was confuted, and as a result, 2 factors from the linear combinations of the original variables were identified. The first one explains the 51.58% of the total variability of the data, and the second one, explicates 8.91%, for a total of 60.41% of the accumulated variability explained by the 2 factors. Figure 8, presented the correlation of the variables included into the PCA and indicates the strong relation within each of the 2 factors.

The PCA proposed 2 factors or components to explain the 60.41% of the total variation of the data. The first factor explains the 51.58% of the data and analyzed the square of the cosines of the variables it can be identified that the original variables that conforms it are: Risk management (RI Total), Resilience (RI 5), Risk assessment / Risk analysis (RI 4) and, Uncertainty analysis (RI 2). As presented, the variables that integrate the first principal component are oriented to the identification and analysis of

Table 2. Proposed model for disruption on project management in the Colombian context

Source	Tools and techniques of the model	Variables of study
Alburquenque Morales, A. (2020)	R&D+I management system; instrument; innovation.	I 3 I 4 O 9 O 10
Boas Viveiros Lopes, Kissimoto, Salerno, de Carvalho & Barbin Laurindo (2016)	Innovation; Innovation Management.	I 3 I 4
Bon (2020)	Decision-making, governance approach.	I 3 O 4
Castro-Leon (2014)	Project management, IT.	O 9 PM Total
Castro, Rincón-González & Diez-Silva (2020)	Project management.	PM Total
Castro Silva & Velásquez Pérez (2018)	Project management, IT.	O 9 PM Total
Chan (2020)	Project management.	PM Total
Collier & Lambert (2018)	Time management, Risk, Schedule, Cost.	T Total C Total RI 2 RI 4 RI 5 RI Total
Collier & Lambert (2019)	Decision-making, Project management, Uncertainty analysis.	I 3 PM Total RI 2
Collier, Hendrickson, Polmateer & Lambert (2018)	Planned investments; Precedence; Critical path analysis; Investments.	O 1 T Total
Dobre & Sorin Dragomir (2017)	Systems.	O 9
Feinbuam (2004)	People.	RE 3 RE Total
Gahagan, & Herrmann (2007)	Cost, Quality, Computer networks.	C Total Q Total O 9
Grosse (2016)	Project management, people.	PM Total RE Total
Haddara & Staaby (2018)	Disruptive innovations, Information management; Information systems.	O 9
Hsu, Aurisicchio & Angeloudis (2017)	Schedule, Cause-effect relationships; delays; Information systems; Chains; Factor analysis; Fault tree analysis; Information.	T Total I 3 O 9 O 10
Hsu, Aurisicchio, Angeloudis & Whyte (2020)	Schedule, Design/methodology/approach; Fault tree analysis; Factor analysis.	T Total RI 2 RI 4 RI Total I 3 I 4 O 9 O 10
Iamratanakul & Kocaoglu (2006)	Innovation; New Product Development; Technological evolution; Computer networks; management; Product.	I 4 O 1 O 9 O 10
Ismail, Bandi & Maaz (2018)	Big Data; Construction Industry; Disruptive Technology.	O 1 O 9 O 10
Jinasena, Spanaki, Papadopoulos & Balta (2020)	Business value; Case study approach; Disruptive; Fintech; Project management.	RI 2 RI 4 RI 5 RI Total I 3 I 5 O 1 O 2 O 9 O 10 PM Total
King, Kelder, Doherty, Phillips, McInerney, Walls & Vickers (2014)	Quality, IT.	Q Total O 9
King, Kelder, Phillips, McInerney, Doherty, Walls, & Vickers (2013)	Decision making; Design.	I 3 O 9

continued on following page

Table 2. Continued

Source	Tools and techniques of the model	Variables of study
Klastorin & Mitchell (2013)	Algorithms; Cost accounting; Managers; Complex projects; Direct labor cost; Disruptive events; Costs.	C Total RE 3 RE Total RI 2 RI 4 RI 5 RI Total I 3 I 4 O 2 O 4 O 9 O 10 PM Total
Leidig, Ferguson & Leidig (2006)	Capstone projects; Community-based projects; Information systems; Computer science; Optimization; Problem solving.	RE 3 RE Total I 3 I 4 O 9 O 10 PM Total
Ma, Xiong, Olawumi, Dong & Chan (2018)	BIM-based project management (BPM); Building; Cooperative communication; Information management; Lifecycle Project Management.	RE 3 RE Total I 3 I 4 I 5 O 9 O 10 PM Total
MacInnes (2005)	Dynamic business model framework for emerging technologies, Disruptive technologies; Dynamic business models; Electronic commerce; Computer networks; Information technology.	RI 2 RI 4 RI 5 RI Total O 1 O 2 O 9
McLoone (2009)	Teamwork, risks; Product design; Product development; Project management; Design process; Life-Cycle; Product definitions	RE 3 RE Total I 4 I 5 PM Total
Midler (2019)	Time, Cost, Quality, Innovation, projects.	T total C Total Q Total RI 5 O 1 PM Total
Mukhopadhyay, Repetto, Luez & Chatelard (2006)	Core disruptive accidents; model; Validation program; Codes (standards); Project management.	RI 2 RI 4 RI 5 RI Total O 9 PM Total
Nguyen, Kneppers, García De Soto & Ibbs (2010)	Schedule, Cost, Risk, Project Management.	T total C Total RI 2 RI 4 RI 5 RI Total I 3 I 4 O 9 O 10 PM Total
Orstavik (2014)	Construction innovation; Creative destruction; Project management; Innovation.	I 3 I 4 O 1 O 9 O 10 PM Total

continued on following page

Table 2. Continued

Source	Tools and techniques of the model	Variables of study
Palomo, Rios Insua & Ruggeri (2007)	Risk, Model, Project Management, Bayesian analysis; decision analysis; risk assess; Bayesian networks; Costs; Decision making; Estimation; Bidding processes; Global forecast; Modern project; Risk analysis; Bayes theorem; cost benefit analysis.	T total C Total RI 2 RI 4 RI 5 RI Total I 3 I 4 O 9 O 10 PM Total
Panneerselvam, Smith, Coker, Kunay, Nishimoto, Neathery & Carpenter (2019)	People.	RE 3 RE Total
Perides, de Vasconcellos & Vasconcellos (2020)	Digital transformation; Change management; Organizations.	RE 3 RE Total RI 2 RI 5 O 9 O 10
PMI (2014)	Complex project management. Human, System, Ambiguity, communications, Stakeholders, Risk, Governance, Team, resilient mindset.	RE 3 RE Total RI 2 RI 4 RI 5 RI Total O 4 O 9 O 10 PM Total
PMI (2017)	Project Management.	T Total C Total Q Total RE 3 RE Total RI 2 RI 4 RI 5 RI Total I 3 I 4 I 5 O 1 O 2 O 4 O 9 O 10 PM Total
PMI (2019)	Risk management, project management.	RI 2 RI 4 RI 5 RI Total PM Total
Rahi (2019 a)	Adaptive management; empirical analysis; literature, resilience.	RI 2 RI 4 RI 5 RI Total I 3 O 9 O 10
Rahi (2019 b)	Resilience, Project Management.	RI 2 RI 4 RI 5 RI Total I 3 O 9 O 10 PM Total
Rechard & Tierney (2005)	Risk management; calculation.	RI 2 RI 4 RI 5 RI Total O 9
Rincón-González (2020 a)	People, project management.	RE Total PM Total
Rincón-González (2020 b)	People, project management.	RE Total PM Total
Rincón-González (2020 c)	People, project management, performance.	I 3 RE Total PM Total

continued on following page

Table 2. Continued

Source	Tools and techniques of the model	Variables of study
Rincón-González (2020 d)	Complex project management.	RE 3 RE Total RI 2 RI 4 RI 5 RI Total O 4 O 9 O 10 PM Total
Rincón-González, C. H. (2021 c)	Projects, portfolios.	I 3 I 4 O 1 O 2 PM Total
Rincón-González, C. H. (2021 d)	PMOs, projects, programs, portfolios.	I 3 I 4 O 1 O 2 PM Total
Rincón-González & Díaz-Piraquive (2020)	PMO, people.	RE T PM Total
Rockström, Andersson, Erixon & Lindblad (2006)	Mathematical models; Public policy; Project management; Early life-cycle phases; Governance models.	I 3 I 5 O 9 O 10 PM Total
Sakamoto (2018)	IT, Project Management, Human, performance.	RE 3 RE Total I 3 O 9 O 10 PM Total
Sharma & Kumar (2020)	IT, Project Management, performance.	I 3 O 9 O 10 PM Total
Sarmiento & Rincón-González (2021)		C Total O 1 O 2 PM Total
Smit, Bond-Barnard, Steyn & Fabris-Rotelli (2017)	IT, Project Management, Project success, Cost, Time, communications, people.	T Total C Total RE 3 RE Total I 3 O 9 O 10 PM Total
Sommer, Dukovska-Popovska & Steger-Jensen (2014)	Case study methods; Complex problem solving; Human resource management; Project management; Product development; governance approach; holistic approach; integrate management.	RE 3 RE Total O 4 PM Total
Tang, Cass & Mukherjee (2013)	Costs; Project management; Construction management.	C Total RE 3 RE Total I 3 I 4 PM Total
van Oorschot, Sengupta & Van Wassenhove (2018)	Time, Team, Project Management, Systems, simulations, Performance, Quality, Cost, life-cycle.	T Total C Total Q Total RE 3 RE Total I 3 I 5 O 9 O 10 PM Total
Villar-Fidalgo, Espinosa Escudero & Domínguez Somonte (2019)	Quality, Project Management, methods; Concurrent activities; Concurrent ; Concurrency control; Application programs; Concurrent engineering; decision-analysis.	T Total Q Total I 3 O 9 O 10 PM Total

Source	Tools and techniques of the model	Variables of study
Williams, Lewis & Bernard (2004)	Issues, Team, life-cycle, Project, disruptive technology, Management.	RI2 RI 4 RI 5 RI Total I 3 I 4 I 5 O 9 O 10 PM Total
Williams, Ackermann & Eden (2003)	Cause-mapping; Delay and disruption; Scheduling; Computer simulation; Mathematical models.	T Total RI 2 RI 4 RI 5 RI Total I 3 I 5 O 1 O 9 O 10
Willis & McKie (2011) Castro-Silva (2018)	Innovation, Management, Stakeholders, IT, Project Management.	RE 3 RE Total O 1 O 9 O 10 PM Total
Windeler & Sydow (2001)	People, Project Management.	RE 3 RE Total PM Total
Xia, Dawande & Mookerjee (2016)	Coordination in teams; Coordination policies; Human resource management; Information technology; Project management.	RE 3 RE Total O 9 PM Total

Source: The authors

possible disruptive events caused by uncertainty from the environment that surrounds the studied Colombian organizations. This principal component is named by the authors as uncertainty management.

The second principal component identified includes the following original variables: Project management (PM Total), Human resource management (RE Total), Scheduling (T Total), Costs (C Total), Quality (Q Total) and, Innovation (O 1). These original variables are related to the management of disruptive events caused by the impacts of these situations generate changes on project planning, particularly on the knowledge areas related to the projects iron triangle, such as resource, schedule and quality management. The authors of this research labeled this second principal component as project iron triangle management.

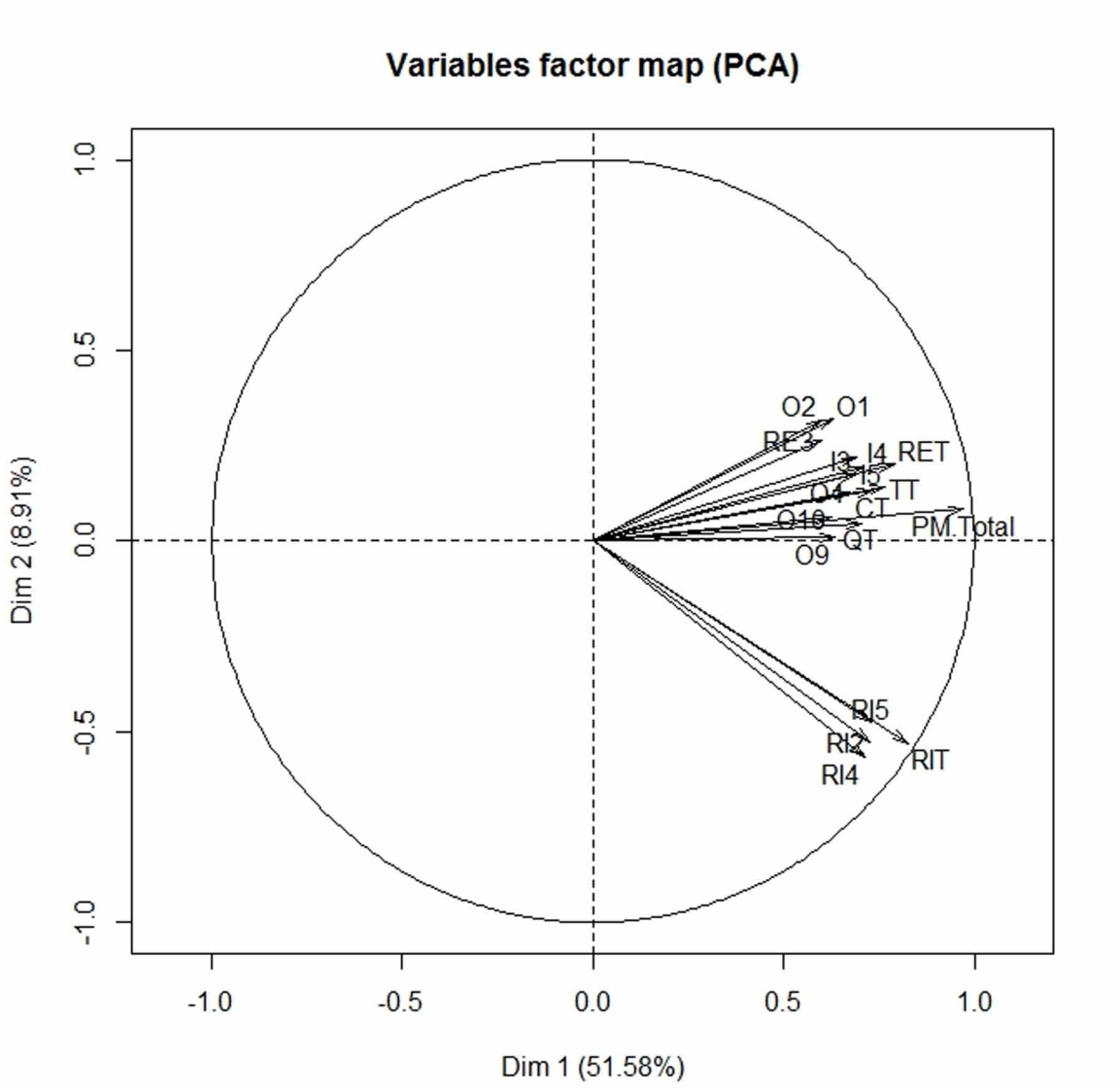
From this empirical study it was identified that the Colombian organizations, in order to face the impact of disruptive events in projects, conduct uncertainty analysis and latter project management plan components related to the project iron triangle.

Figure 9 presents the dispersion of the organizations from the sample, distributed according to the 2 dimensions identified on the PCA and named as uncertainty and project iron triangle management. Figure 9 shows the concentration of the organizations in 3 sectors, this condition leads to a conglomerate analysis in order to verify the existence of clusters within the organizations of study.

Figure 10 presents a dendrogram result of the conducted conglomerate analysis. In a coherent way the presented on Figure 9, it was evidenced the existence of conglomerates of organizations differentiated by the level of utilization of tools and techniques for the management of disruptive events on projects. The authors of this research identified 3 specific clusters of organizations: the first one with low levels of implementation of tools and techniques, the second one with an intermediate level of implementation, and the third one with characterized by a systematic use of project management processes and techniques oriented to manage disruptive events.

Figure 11 shows individual boxplots per each of the identified clusters of organizations. If so the range of the 3 clusters is similar, the quartiles of the factor or principal component related with the analysis

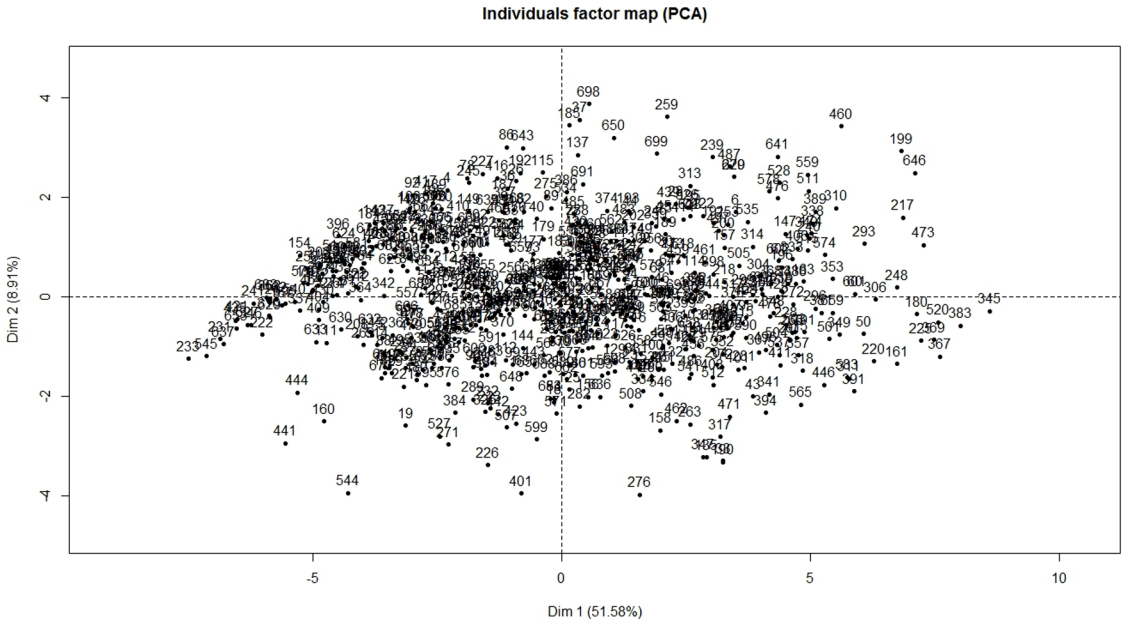
Figure 8. Variables factor map(PCA)of disruption on project management in Colombia
Source: The authors



of uncertainty, it is observed that the median of the increases as it moves forward from the first cluster (low level of implementation) up to the third cluster (high level of implementation). Figure 11 presents a significant differentiation on the level of implementation of tools and techniques to manage disruptive events on projects; nevertheless, it is needed to corroborate this finding by conducting a variance analysis (ANOVA test).

Table 3, shows the results from the variance analysis with a significance level of 5% (α=0.05). The observed value of the significance p_value $\approx$ 0.00, allowed to deduce that there is sufficient sampling evidence to reject the hypothesis of equality of means of the 3 identified clusters. Therefore, the results from this study allowed to conclude that within the sample of Colombian organizations oriented to

Figure 9. Individuals factor map (PCA)of disruption on project management in Colombia
Source: The authors



projects, there are 3 significant differentiated clusters related to the average use of tools and techniques to manage disruptive events on projects.

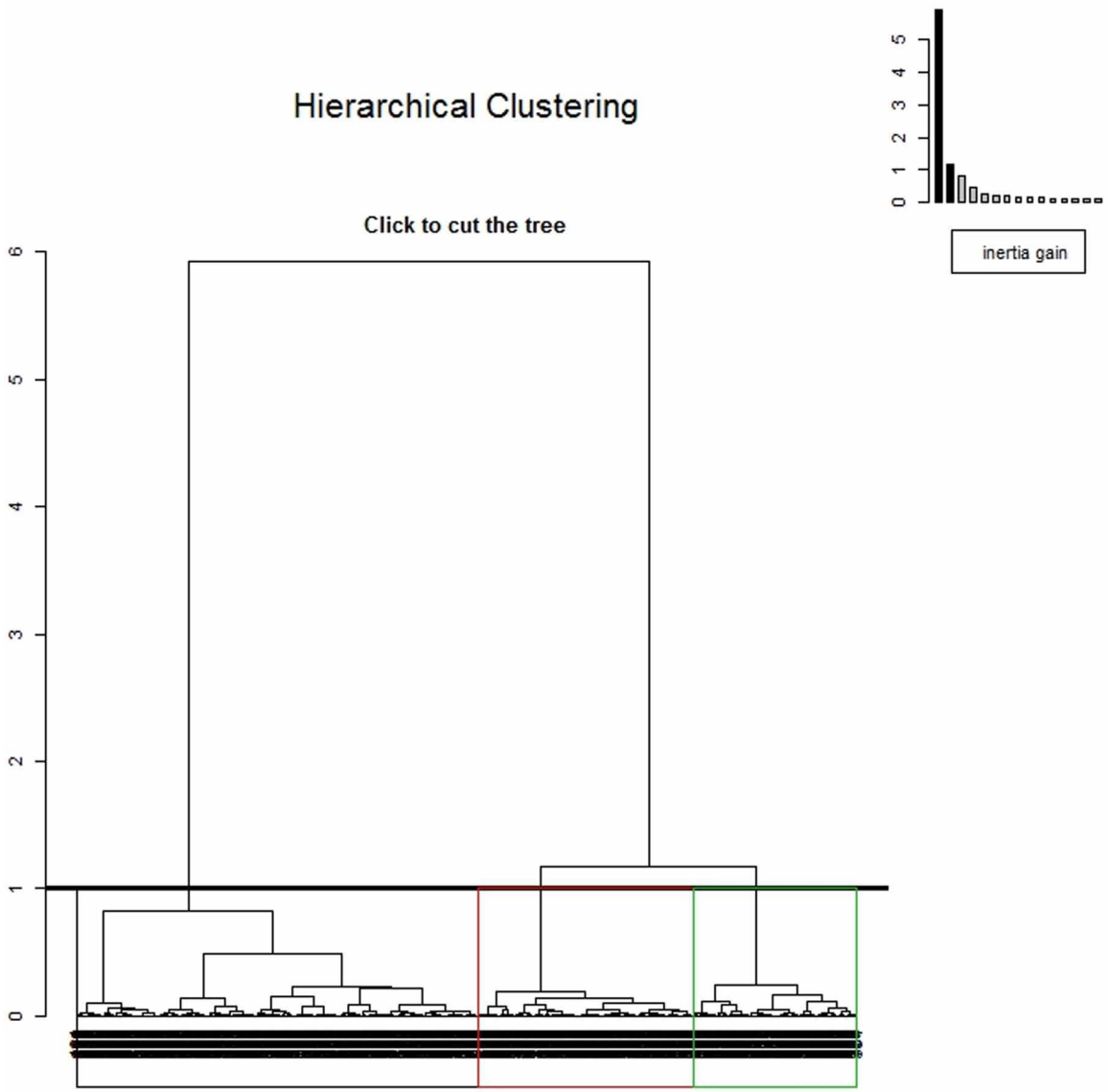
With the primary information collected on the extensive fieldwork covering 702 organizations nationwide, 3 clusters for the analysis of disruption on projects in Colombia were identified. On each group, a description based on characteristics of the clustered organizations, were documented, and a diagnosis, from the effect of disruption on projects were defined, as presents on Table 4.

Figure 12 presents a general diagram of the proposed model and its interrelation with project management in organizations. The project management office (PMO) must support and enforce compliance with the necessary procedures to ensure that appropriate and timely strategies are identified, evaluated, and generated for disruptive events that may occur during the project life cycle. As can be seen in Figure 12, constant monitoring of uncertainty in the environment in which the project is developed is essential.

Figure 12 identifies the two factors resulting from both the analysis of the scientific literature and the empirical work carried out in Colombian project-based organizations. The first factor corresponds to the uncertainty management processes where techniques and tools focused on identifying and evaluating disruptive events that may affect project performance are used. Using creativity and innovation techniques and tools, strategies should be proposed that allow minimizing the negative impact of disruptive events and maximizing the positive impact of these events.

Factor 2 or management of the iron triangle of the projects, shown in Figure 12, implies the evaluation of the impact of the strategies proposed to manage the disruptive events of the project. The results of this evaluation generally have consequences for updating project plans in knowledge areas such as: resource management, schedule management, and quality management. The PMO must direct the man-

Figure 10. Hierarchical clustering of disruption on project management in Colombia
Source: The authors



agement of changes generated by the occurrence of disruptive events that affect programs, portfolios or the organization's strategic plan beyond the project.

SOLUTIONS AND RECOMMENDATIONS

Project management implies managing change and in the current environment of organizations change occurs constantly. Although there are bodies of knowledge that compile the best generally accepted project management practices, the development of a management plan does not, by itself, guarantee protection

Figure 11. Boxplot of the clusters of disruption on project management in Colombia
Source: The authors

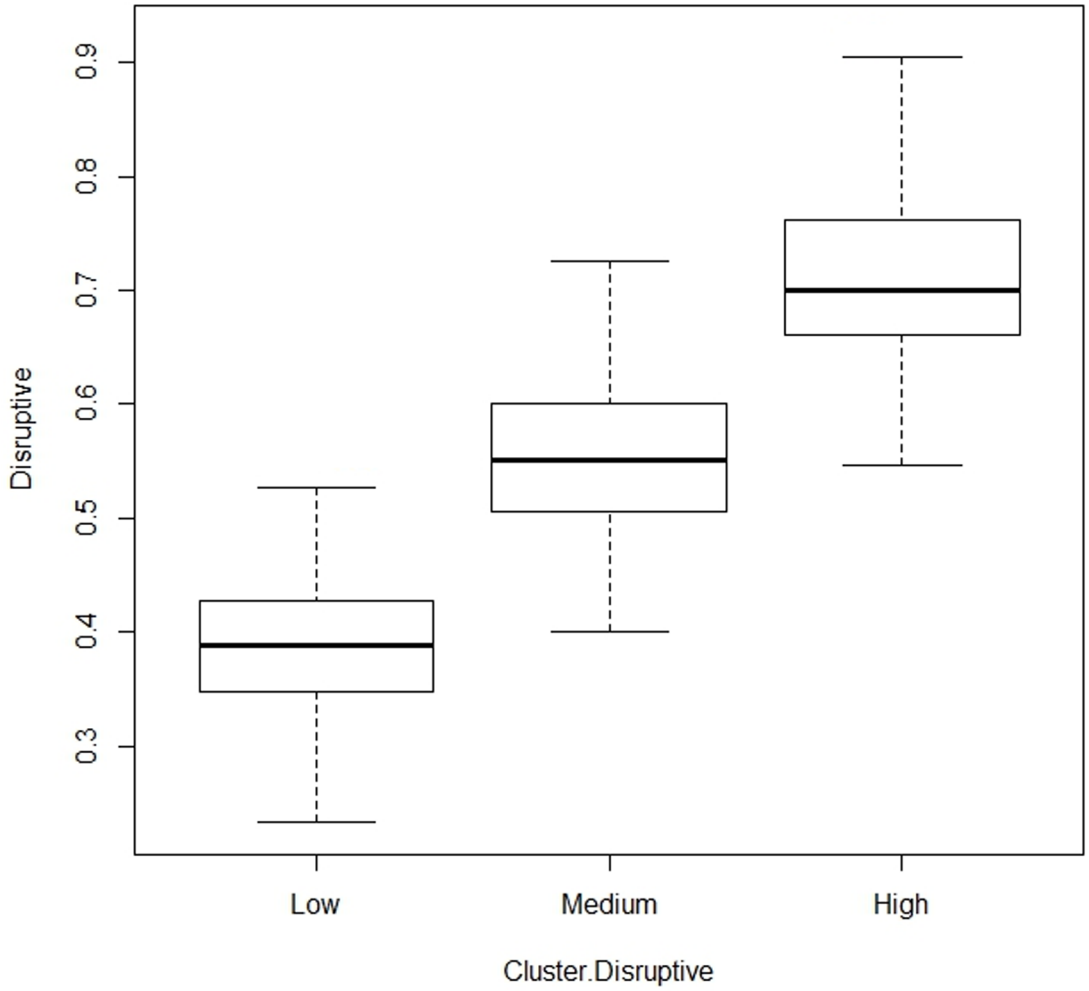


Table 3. Variance analysis of disruption on project management in the Colombian context

Source of variation	Freedom degrees	Sum of squares	Mean square	F	P_value
Clusters	2	10.698	5.349	1205	<2e-16
Residuals	699	3.103	0.004		

Source: The authors

Table 4. Clusters analysis of the model of disruption on project management in the Colombian context

Cluster	Description	Diagnosis
Low	Lack of project management tools and techniques to deal with disruption was evidenced in aspects such as: iron triangle elements (scheduling, cost and quality); insufficient human resource management tools; reactive uncertainty and risk management practices; inadequate performance measurement and decision making tools; poor project life-cycle management; lack of strategic planning and investments improvement artifacts; absence of governance approach; and deficient use of mathematical, systems, IT and optimization tools.	Reactive approach when dealing with disruption in projects, evidence of lack or inadequate use of suitable project management tools and techniques.
Medium	Presence of some tools and techniques to face the effect of disruption on projects on basic elements such as scheduling, cost and quality management; use of some elements of human resource management; some practices of risk management used to deal with uncertainty; basic projects performance indicators and measurements; decision-making based on performance indicators; definition of stages related to project life-cycle; some sort of alignment of projects with strategic planning; basic practices of project governance; use of IT tools and systems to deal with disruption in projects.	Some tools and techniques had been incorporated in order to increase levels of control over project conducted by organizations of this cluster. Control measurements and tools help to deal, up to some point, the unwanted effects of disruption on projects.
High	Strong use of tools and techniques to deal with disruption on projects on triple-constrain elements; use of human resource management; comprehensive use of practices of risk management used to face uncertainty; detailed projects performance indicators and measurements; predictive decision-making processes in place; life-cycle approach to manage projects; strong alignment of projects with strategic planning; reliable practices of project governance; wide-ranging of IT tools and systems to deal with disruption in projects.	Proactive approach when facing the effects of disruption in projects, evidence of a structured approach and use of suitable project management tools and techniques to deal with disruptive situations in projects.

Source: The authors

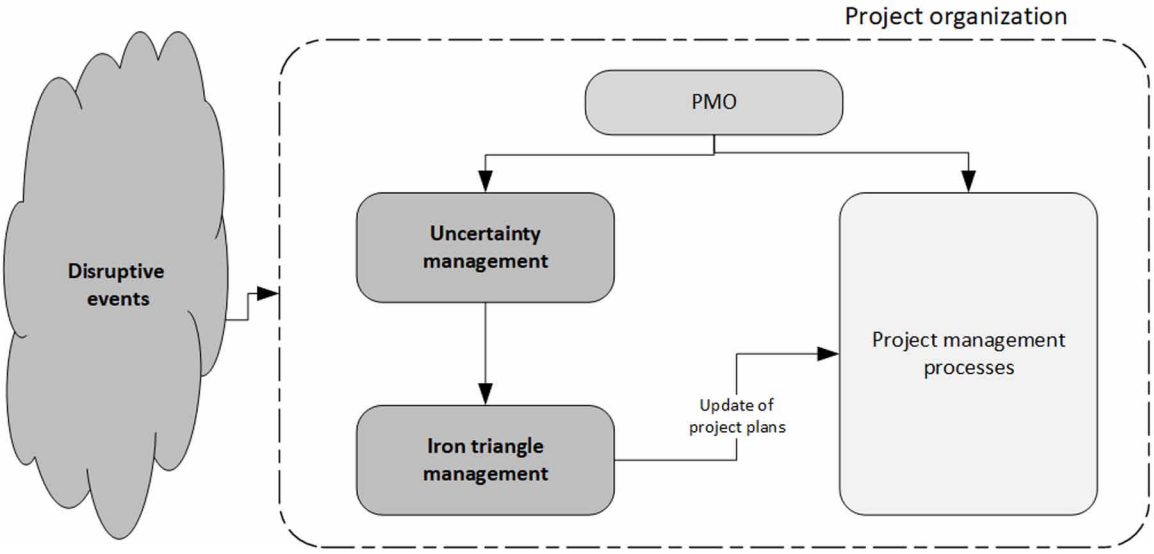
against the impacts that the occurrence of a disruptive event during the life cycle of the project. For this reason, it is essential in today's world that every project manager has the skills to identify disruptive events and to generate strategies that allow a high percentage of project performance to be guaranteed.

In countries such as Australia and some in Europe, in recent years the interest on the part of the scientific community to carry out research related to disruption in project management has increased, however, it is a reality that in Latin America there is lacks this type of study. Therefore, it is necessary to implement strategies to encourage academics and project management practitioners to share their experiences related to the implementation of strategies in organizations to deal with disruptive events.

The authors of this research highlight as one of the possible strategies to increase the number of investigations and publications related to the management of disruptive events in projects: a) the realization of international scientific events focused specifically on this topic and b) the generation of networks academics made up of universities, research groups and entities interested in the subject, in order to optimize scarce resources for research and to be able to investigate both the impact and the use of techniques and tools to manage the impacts of disruptive events on projects .

It is important to highlight that the projects contribute significantly to the social, technological and economic development of the countries. In this sense, and given the social, economic and health crisis generated by the COVID19 pandemic, felt with greater rigor in Latin America, any contribution that

Figure 12. Scheme of the proposed model for disruption on project management in the Colombian context
Source: The authors



seeks to improve project performance is very important. On the other hand, according to the result of the scientometric analysis, it was found that the research work carried out in other geographical contexts is far from the reality of the efforts carried out by organizations in Colombia and does not come close to the way in which disruptive situations affect the performance of projects in Colombia.

The authors of this research contribute as an alternative solution to this problem in Latin American organizations, the implementation of a management model that allows project managers to plan actions to face potential and real disruptive events in order to guarantee project success. The proposed model includes the integration of project management techniques and tools in areas such as risk management, schedule management, risk management, and risk management.

The results of this research show that there is a high percentage of Colombian organizations that require proposals related to the systematic implementation of techniques and tools for managing disruptive events in projects. For this reason, it is necessary to sensitize project managers to the need to include strategies to deal with disruptive situations within project management processes. In addition, the implementation plan of the proposed model must include a change management plan in the organizations, training sessions and the adaptation of programs to monitor the environment and generate early alarms to adjust the project plan to the possible impacts of disruptive events.

FUTURE RESEARCH DIRECTIONS

Disruption as a common element on projects must be address decisively by project manager and organizations in order to fulfill project objectives, create value, and align projects whit corporate strategies. Therefore, suitable project management tools and techniques should be set on place, integrated, complemented, and measured, with the purpose of face disruptive situations and enhance project performance.

It is so, that the results from this research work are suitable to be replicated in other geographical contexts, in order to conduct correlation analyses, to compare the how project management tools and techniques reduce unwanted effects of disruption on projects and contribute to a better performance of this kind of endeavors in other business environments.

CONCLUSION

The scientometric study on the disruption and management of the project, carried out on 176 publications in two of the main scientific databases, allows us to identify that the interest in the subject in the academic community began around 1996. Also, this analysis shows that in the last decade there has been a significant increase in scientific publications related to disruption in project management.

The five terms used most frequently in research on project management and disruption correspond to: (a.) Construction industry, (b.) Decision-making, (c.) Risk management, (d.) Companies and institutions, (e.) Product development. This shows that the interest in this subject is found in the engineering and business administration sectors.

The foregoing is also evidenced when analyzing the result of the scientometric analysis on project management and disruption, where the five main most influential sources are identified as: (a.) Engineering, construction, and architecture management, (b.) Engineering and Construction Management Journal, (c.) Procedures Informatics, (d.) ASCE - ASME Journal of Risk and Uncertainty in Engineering Systems, (e.) IEEE Systems Journal. As can be seen, the areas of construction engineering and computer science are those that collect the greatest interest from the academic community.

Also, it is important to note that the result of this analysis shows that the countries leading the research on project management and disruption are: (a.) Australia, (b.) Canada, (c.) China, (d.) France, and (e.) Germany. This finding highlights the lack of research related to this issue in Latin America and therefore in Colombia. This situation poses a challenge for the academic community of this region and also highlights the importance of this document. Scientometric analysis highlights the need to study the Colombian context to identify the strategies, techniques and tools used to face disruption in project management.

With this objective in mind, an empirical study was conducted involving 702 project organizations in Colombia. This study made it possible to identify three conglomerates of organizations that differ significantly in their level of performance when facing disruptive situations in the projects.

The first group of organizations is characterized by their reactive approach when facing disruptive situations in projects. In this conglomerate of companies, there is evidence of the lack or inappropriate use of adequate project management tools and techniques to manage these disruptive situations. In general, these types of organizations have low levels of planning and implementation of tools to manage disruptive events in areas of project management such as: human resource management, risk management, schedule management, budget management and quality management of the project.

The second group of organizations identified in this study is characterized by incorporating some tools and techniques to face disruptive events in their projects to increase the levels of control throughout the life cycle of the projects. In general, the organizations belonging to this cluster have some type of alignment of projects with strategic planning, basic practices of project governance, and use of IT tools and systems to deal with interruptions in projects.

Finally, the third group of Colombian organizations is characterized by having a proactive approach to the impact of disruptive events on projects. The organizations that were located in this cluster also evidenced the implementation of a structured approach and the systematic use of adequate project management tools and techniques to deal with disruptive situations in the projects.

The results of the scientometric analysis and of the empirical study directed to project organizations in Colombia, justify the realization of proposals that tend to increase the level of implementation of techniques and tools to face disruptive events in the projects. As a result of this research, a model of project management tools and techniques is proposed to face disruptive situations in the context of Colombian organizations. The proposed model aims to improve both the internal and external performance of the projects; increase the creation of value in project organizations and; guarantee the alignment of the project objectives with the strategic approach of the companies.

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KEY TERMS AND DEFINITIONS

Change: A situation in a project that modified its planning generated by a disruptive situation on the project itself and/or its environment.

Complexity: A characteristic of a project that implies difficulty on its management and therefore demands enormous effort to lead it to a successful closing.

Disruption: A characteristic of a project that affects its planning, baselines, assumptions, constrains, and other project management artifacts, that may compromise the ability of the project to reach its objectives.

Project Management: The application of knowledge, skills, tools and techniques, to deal whit disruption, as a way to achieve project's goals.

Risk: An uncertain event or situation that if occurs, may have a positive or negative impact on project´s objectives and/or goals.

Tools and Techniques: Part of a defined project management methodology, designed to solve situations that may occur on a given project, included those of a disruptive nature.

Uncertainty: A characteristic of a project related to the lack of knowledge, understanding, and/or awareness, that affect its ability of fulfill project goals, by increasing the impact of issues and risks.

Unpredictability: A result of a project caused by disruption and or complexity, that makes difficult to predict the way the project will follow.

Chapter 13
Chaos Management Leadership Resulting From the Pandemic in Ibero-American Universities

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ABSTRACT

The pandemic and its effects on the development of a new normality in the Latin American education sector has transformed the traditional education systems creating new means of communication, coordination, and learning assessment. This study uses a qualitative methodology with descriptive basic statistics, applied to 16 leaders (deans and directors) responsible for the direction and management of universities in an atmosphere of chaos. The above allows creating a conceptual model that explains context components, leadership, and initiatives. At the same time, the variables and their connections are defined establishing a novating flexible, technological, and inclusive education strategy in the region that is here to stay for management and building of knowledge.

INTRODUCTION

People need to have control over their life; presence of control is linked with wellbeing and correct psychological functioning, its absence is related with dysfunctional anxiety, stress and depression. Having

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control means having the ability to predict what events may occur and what behaviors should be carried out to control the situation (De Miguel et al, 2012; Ajzen, 1985). This way, human brain attempts to minimize uncertainty, and does it as a large prediction to satisfy the psychological need of control has been building a social order that acts as conduct guide, reducing uncertainty based on socially accepted conducts. Nevertheless, circumstances caused by the pandemic COVID-19 have a notable effect on the capacity of the institutions to preserve this social order. When social order loses its ability to guide people's conduct, uncertainty is the fundamental characteristic of the social scenario and fear its psychological translation (De Miguel, 2012; Beck, Giddens, & Lash,1994). We may consider that Covid-19 has created more complexity in the system and has opened the door to chaos.

Complex systems constantly change over time, chaos occurs when these changes are unpredictable and do not follow a fixed and predictable pattern for which there is a prior planning of the actions to follow. Chaos is not generated, but exists naturally, by itself (Turnheim, 2013). Now, leadership and decision-making of the directors of the organization is important, since it is necessary that they learn to sail in the dynamism of a systemic structure and recognize no total stability or linearity of the system.

In the current context of universal dynamism and global chaos due to untimely and unpredictable changes caused by COVID 19 pandemic, the conventional leadership model has become obsolete; it is no longer viable to speak only about personal attributes of a leader, it is necessary to analyze aspects such as flexibility in decision making, adjustment to change and remote or virtual team management; this has led to a new model of chaos leadership within the world chaos. Leadership of Ibero-American universities faced to challenges of the COVID-19 pandemic (and variants in the region) becomes an ideal scenario to analyze leadership in terms of chaos management, which has modified the educational strategy for new perspectives affected by disorder, instability, dynamism, and the need to get adjusted to a new reality (Harry, John, & Keegan; 2013).

At this time there is evidence that university leadership in different Ibero-American countries have undertaken things that without crisis possibly would have not done, they have made quick decisions, adjust to current conditions, lead on-line, innovate, diversify, taking into account needs and expectations of their group of interest, continuous learning, enhance collaborators skills and transform new challenges into adjustment opportunities and changes, creating future positive options and communicating them in an appropriate manner.

According to Prigogine, "…systems contain subsystems that continually fluctuate. Sometimes a single fluctuation or a combination of them can become so magnified by the feedback that the pre-existing organization is strongly affected. The speed of context changes and its impact on the organization itself is such that chaotic situations and disorder are generated. These are the ones that allow organization directors obtain flexible and fast opportunities. On the contrary, those who remain in bureaucratic and planning schemes lose the opportunities" (Prigogine & Nicollis, 1895).

Because of the pandemic, university education sector in Ibero-America has faced challenges, problems, experiences, and questions regarding leadership of higher education institutions in times of economic, social, cultural and political crisis. There is little literature may allow contributing with knowledge in the process of decision-making on this matter subject.

Consequently, there is an incentive to study leadership models in the education sector in the region in order to find concepts and strategies that contribute, from the administration of chaos, with the positioning and development of university educational institutions. Hence, the following research questions arise:

Which have been the leadership models to manage the chaos in the Ibero-American educational sector during the pandemic?

Which have been the hard and soft skills characterizing leadership in university organizations, based on MUSHIN leadership model as a reference?

METHODS

This is a qualitative research (Moen & Middelthon, 2015), based on descriptive basic statistics developed in 16 universities of Ibero-America with answers from directors and deans that have leading functions in the administration and management of chaos and is analyzed during the pandemic and the economic reactivation processes. Three phases were developed; during the first one there was a conceptual analysis based on research from Research Center for Effectiveness Talent Organization UAM, University of Madrid, afterwards an instrument to collect information in selected universities regarding leadership role of its directors during 2020 and 2021 was developed; in the last phase results were validated and a conceptual model was proposed by a focus group of experts; these are the founding to continue the study of education in the region. Methodology phases are set up in the following.

Table 1. Methodological phases

Phases	Description	Population	Instrument
Literature Review	Articles and documents with leadership perspective in education, theory of chaos, Ibero-America Universities in Covid 19 Framework, leadership, Mushin model was the reference in this research and Management and building of knowledge with the pandemic	21 articles ProQuest Science Direct	Data matrix collected
Design of collection tools	Survey forms were defined through virtual app	16 universities	Data base
Data collection and analysis	Group of experts in education and from the university	4 experts in Ibero-America.	Model

Source: authors herein (2021)

This research considers different higher-level education institutions of Ibero-American countries. The study is carried out by PHD students of Autonomous University of Madrid, Faculty of Pshychology and School of Business Administration in Bogotá and is conducted by the Director of Research Center for Effectiveness Talent Organization UAM, University of Madrid. We seek to provide knowledge to the university sector in Ibero-America regarding chaos management. From a co-building approach and an integral vision, the research will set typical leadership models of the Ibero-American University Institutions because of COVID-19 pandemic.

For the present investigation the main objective is analyzing leadership models for chaos administration in University Institutions of Ibero-America, in times of pandemic. To achieve this the research team develops the following specific objectives: reviewing existing literature concerning leadership models for chaos management, defining leadership chaos administration models in the University Institutions in Ibero-America, and confirming lessons learned and good practices in chaos management in the university sector per country.

LITERATURE REVIEW

Theory of Chaos

Ilya Prigogine (1917-2003), Chemistry Nobel Prize in 1977, is the main representative of the theory of chaos or the theory of dissipative structures, which states that "the world does not strictly follow the model of the clock, predictable and fixed, but rather has chaotic aspects" (Prigogine & Nicollis, 1985; Prigogine, Vivanco & Sanz, 1999). Recognition of dynamic systems that behave in an unpredictable way is therefore determined. The concept of change is inherent in organizations, while chaos is defined as the possibility to predict the future and determining in advance measures that need to be carried out to solve it. Nonaka (1988), Singh & Singh (2002) state that chaos and disorder are regular properties of organizations and when properly managed they can bring innovation and productivity.

For Mintzberg (1991) organizations are a system comprised by interrelated elements that generate entropy when one of its elements is negatively modified creating instability, value and growth loss. Cocieru, Katz, & McDonald (2020) point out that it is necessary to adopt strategic models and chaos management plans aimed at complying with organizational objectives.

Thietart, & Forgues, (1995) affirm that organizations, as complex systems that adequately manage chaos, generate innovation and adjustment to the market and generally meet the following characteristics: (i) flexibility opposed to the rigidity of the system, (ii) dynamic and unbalanced organization, (iii) dependence on initial conditions, (iv) unstable behavior of the system, (v) non-existent or inapplicable long and medium-term planning, (vi) adaptability ability and, (vii) creativity.

The educational sector in Ibero-America has kept a direct connection with the chaos, dynamism of the pandemic and economic reactivation, especially if we consider the need to move towards a society of knowledge, convergence of the agendas of the new leaders, the strengthening of a common cultural space and the need to keep up and running un educational system and science. For Davies (2018) and Karp & Helg (2008), university institutions are chaotic organizations by nature that face constant changes in highly uncertain environments, making it difficult to fulfill long-term plans.

MacIntosh, Maclean, Stacey & Griffin (2013), understands the complexity in university organizations under the following parameters: "a) the multiplicity of goods it produces, which denote the variety of its organizational purposes and its role in society and economy. b) The decision-making process in which, thanks to the specific status that academic and institutional autonomy gives to them, multiple actors intervene, inside and outside the organization, each of which has a different weight depending on the internal structure of the government and in accordance with the degree of coordination exerted by the State or the market (Wan, 2016). c) The variety and specificity of coordination and motivation mechanisms for the economic production of the university educational service. d) Institutional differentiation and diversification of programs that characterize higher education, where public and private, third parties and university establishments coexist and in all of which, a wide variety of undergraduate and graduate degrees in diverse disciplinary fields are offered."

Musselin (2007) the university is analyzed as a black box in higher education studies. At the same time, it is the main responsible for indicators of scientific productivity (publications, recognition of research groups, patents and grading of researchers). For example, Latin America provides 1% of the planet's scientific production and Colombia only represents 1% of the region, that is, with 0.62% of the planet's population its contribution is 0.01%. The educational sector in Ibero-America has evolved in parallel with public administrations. In the 80s, Latin American universities recognized the importance

of educational quality as pillar that guarantees knowledge in the region (Torres, & Schugurensky; 2002), while in the 90s the concern was university efficiency, which in countries such as Argentina, Bolivia, Chile and Mexico reached a new paradigm in a high percentage, faced to the change of public university identity towards a global business context, in which the university administration changed to be self-sufficient and a generator of value. (Breakwell & Jaspal, 2020).

Ibero–America Universities in Covid-19 Framework

With the pandemic of COVID-19 all different social systems have been impacted as well as the world's daily life and higher education has not been the exception (Farseev, Chu-Farseeva, Qi, & Loo; 2020). According to UNESCO (2020), approximately 1.5 billion students from 165 countries have not been able to attend teaching centers because of the Covid-19. With the arrival of the pandemic universities all over the world are exploring new ways of teaching with new challenges for university leaders, teachers and students. More than one year after the beginning of the pandemic, we can clearly say that challenges have been overcome and Ibero-American universities have managed to keep afloat the education system, long distance, virtual and semi-in-person teaching, although no preparation existed. This job has been possible because universities function as organizations and certainly due to its leaders.

For Iglesias-Pradas, Hernández, Chaparro & Prieto (2021) all changes in higher education teaching, leadership and management process have been of vital importance since they dictate the vision to face COVID challenges; this has been recognized by the guide to assess university quality programs given at distance prepared by OEI in collaboration with Red Latinoamericana para el Aseguramiento de la Calidad de la Educacion Superior (RIACES) and Sistema Iberoamericano de Asegurameinto de la Calidad de la Educacion Superior (SIACE) that consider facilitating leadership and management process as one of the common indicators of assessment; different sub criteria are taken into consideration in the quality excellence model adjusted for education, as follows:

- Commitment to excellence culture of leaders and people responsible for the programs in the framework of the policies and strategies of the institution (Williams, Berger & McClendon, 2005).
- Active work of leaders and people responsible for the program with inside and outsiders to promote and develop interests and satisfy current and future expectations from the implied agents organizing the program (Bass, 2000).
- Guarantee from leaders and people responsible for the program that the organizational structure is developed and is sufficiently flexible to support an efficient policy and strategy, in harmony with the values and culture of the institution (Su, Yang, Yang, 2012).
- Guarantee that the programs processes are managed, systematically, improved and keep in line with institution's management and continuous improvement (Lehan, 2020).

On the other hand, United Nations Academic Impact initiative has studied the effects of Covid-19 on students, teachers, and researchers, as well as lessons learned, positive results of Covid-19 and its consequences on higher education. It has established the need to create new ways to divulge knowledge, creation of new teaching methods and education alternatives (Pokhrel & Chhertri, 2021). The UNESCO report "COVID-19 and Higher Education": From the immediate effects to the day after: an overview about the impact of the pandemic on universities", highlights that Covid-19 generated the temporary transition to a virtual educational system in the universities, as well as the strengthening of psychological

help to teachers and students and also brings into account the need of financial and technological assistance for universities, psychological help that students and teachers will require and the transformation of universities in terms of quality and equality.

LEADERSHIP

For Kaul, Shah & El-Serag (2020) leadership and decision-making of organizations directors become important, since it is necessary to navigate in the dynamism of a systemic structure and recognize there is no overall stability or linearity of the system.

We understand leadership as the "psychosocial phenomenon that revolves around influence and power processes" (De Miguel, 1999), to understand those situations where the individual exerts influence over a group that accepts said influence through interaction. Influence understood as "any change in the person (thinking, attitude, emotions or action) as a result of the actual, implicit or imagined presence of others". (Latané & Nida, 1981; Fernández & Shaw, 2020). The above is summarized in figure 1

In such situations, the phenomenon of power is also present, which in traditional organizations is held by the institutional power of the position, and it is necessary that, in the event of the leader, institutional power and personal power fall to him.

This way, the subject is identified, that is, the leader, who in the case of universities in Ibero-America responds to rectors, deans and directors of departments, programs, or research centers. It is important to specify that among the directors who hold the institutional power, there may be agent directors and leading directors.

Yang & Wang (2014) points out the topics and assumptions concerning the differences between directors as managers and directors as leaders and specifies that some of the characteristics of directors as leaders are: they define the vision/mission, they inspire the vision in the organization, motivate and inspire, provoke change and innovation, create commitments, stimulate additional efforts, greater attention to intuition, active orientation towards environment, do the right things, are interested in efficiency, innovate/develop, focus on people, align with people with a purpose, pay greater attention to philosophy, values and objectives, have a long-term vision, focus on the future with eyes on the horizon, develop visions and strategies and encourage people to change, among other things.

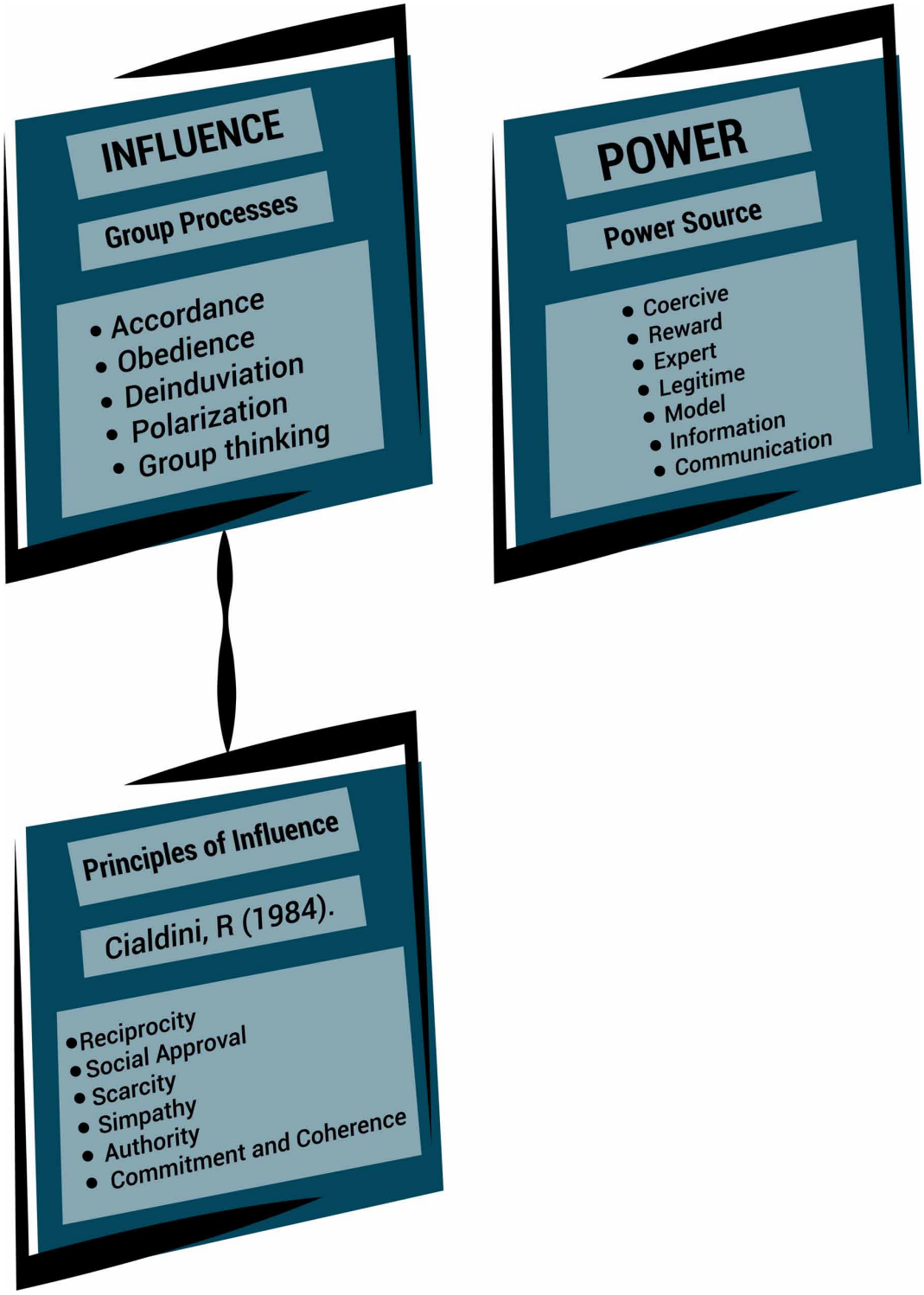
Nowadays organizations need leaders who know how conduct them effectively. Organizations Directors are responsible for maintaining stability and order, ensuring continuous operation, and ensuring that the organization complies with policies and guidelines set. From their side, leaders are responsible for adopting new perspectives and ideas, motivating work teams, and making decisions to strengthen and develop organizations (Palacios, Perez, Ramírez & Salcedo, 2020).

Once the subject is clear, analyzing leading action comes after because the MUSHIN leadership model interprets leadership as a phenomenon of

psychosocial nature managed as a system made up of actors and actions in each setting. Hence, leadership does not only contemplate management as action, but includes actions such as "communicating, motivating, resolving conflicts, developing teams, guiding actions" (De Miguel, 1999), adjusting to the group, promoting innovation and creativity, achieving objectives, and accepting new challenges, among many other things (Adams, 2005).

If we review the actions from the behavioral perspective of leadership, we could well say that leaders' actions are focused on tasks and production, on relationships and people, hence from these two large

Figure 1. Leadership dimensions
Source: *Authors Herein (2021).*



action groups the Management Grid designed by Blake and Mouton (1969) leadership styles are defined as: i. Impoverished, ii. Country club, iii. Produce or perish, iv. Balanced and v. Team.

Actions may also be seen through Hersey and Blanchard leadership model: situational leadership and according to it four leadership styles are defined: i. To Conduct, high on tasks low on relationships, ii. Persuade, high on tasks and relationships, iii. Participate, low in tasks and high in relationship and, iv. Delegate, low on tasks and in relationships. This leadership model is based on the three-dimensional relationship, task-oriented behavior, relationship-oriented behavior and the third dimension, which is the maturity of the group, operating as a situational or context factor and is "the skill and willingness of people to accept the responsibility for directing their own behavior" (Hersey and Blanchard, 1981).

This third dimension of maturity of the group or of the followers, has two dimensions: technical maturity and psychological maturity; technical maturity understood as the experience, knowledge and skills that individuals contribute to the development of a task; psychological maturity is understood as the commitment, motivation and confidence of individuals to carry out a task; sub-dimensions must always be analyzed faced to a specific task.

Regarding the decision-making process, we could well take as a reference Vroom and Yetton leadership model according to which the form and participation in decision-making sets leadership style, classifying the decision-making processes as: i. Autocratic, ii. Consultative and iii. In Group. All styles are effective, depending on four variables applicable to each style: "-quality or rationality of the situation, -collaborators' acceptance of the decision, -amount of time required to make decisions, - significant differences of results obtained according to these methods, any of them remaining constant from one to another situation" (De Miguel; 1999, Bakanic, McPhail & Simon; 1987).

The ability to exert control over the environment is considered a basic motivation (Adler 1930). Thus, individuals plan their behavior to obtain the desirable consequences from the environment, to be effective making changes in their environment and preserve social order. Likewise, the need for control as motivation, united to dominance motivation create power motivation (Madsen 1973), as well as the need to exert control and influence over others, through influence and persuasion over decisions of third parties. Therefore, we find power is an expression of the need for control.

Based on this, we may understand leadership as a process of influence (change) focused on improvement, development, and continuous learning with the purpose that people and groups achieve excellency in their goals: vital, professional or entrepreneurial, personal and commons goals contributing to the mission of organizations (De Miguel and Ortiz, 2020; Ramírez, et al; 2020).

For Akbari, Bagheri, Imani, & Asadnezhad (2020) leadership as influence process shall consider both group processes and principles of influence. For group processes of influence, we may point out that they are the social psychological processes in which one or more people influence the behavior, attitude, feelings, opinion and/or attitudes of others and may find different types of processes such as: i. Consent, ii. Obedience, iii. Deindividuation, vi. Polarization, and v. Group Thinking. Likewise, there are six principles of influence presented by Cialdini (1984) that is: i. Reciprocity, ii. Social validation, iii. Scarcity, iv. Sympathy, v. Authority and vi. Commitment and coherence.

The New Normal in Latin America

The new normal in Latin America develops in a context of economic, political, cultural, and social uncertainty in the region (Baldwin & Di Mauro, 2020). Organizations and educational institutions have been affected since the beginning of the pandemic (Varela, 2020; León & Cárdenas, 2020).

For Montenegro (2020), the education sector in the region has been one of the most affected by the pandemic. The insolation and quarantine measures placed by governments, the transformation of society towards virtuality, travel restrictions, social distancing and the economic and purchasing consequences of the population (Unger & Meiran, 2020).

The International Monetary Fund - IMF, presented that the economic prospects for the planet in 2020 were 3.6%. However, COVID 19 and its effects have shown a significant decrease. For example, in the United States of America it decreased to -5.9%, Germany to -7%, France to -7.2%, Japan to -5.2%, the United Kingdom to -6.5% among others (IMF, 2020)

The Economic Commission for Latin America and the Caribbean-ECLAC for the year 2019 shows that exports and imports in the region has decreased by 3% (ECLAC, 2020). The foregoing determines an example that affected the education sector, especially in Brazil, Mexico, Venezuela, Ecuador, and Colombia.

Face-to-face universities needed to reinvent themselves, for Hodges et al (2020) the concept of emergency remote teaching was created. The teachers modified their strategies and mechanisms to expand the socialization and dissemination of knowledge, to achieve true learning management processes with their students. On the other hand, UNESCO (2020) describes the transformation of students, who approached educational platforms, breaking in many contexts the traditional education systems in the region.

One of the great challenges of this new normal for learning has been experienced by people who were not used to or did not know about digital culture (Beltrán, Venengas. Viallar, Cabello, Jareño & Gracia 2020). For Zubillaga & Gortazar (2020), distance education modifies teaching planning, seeking to create spaces for online interaction. These practices have presented the closure of universities that failed to adapt to these new forms of relationship with the academic community (Cabrera, 2020). The most critical factors are social inequality, the typology of the students' homes, access to computers and internet connection (Asanov, Flores, McKenzie, Mensmann & Schulte (2021).

Management and Building of Knowledge With the Pandemic

For Key & Runsten (1999), organizations in Latin America, understood as social systems that seek to achieve a common goal. Based on Tracker (2020), the economic situation resulting from the effects of the Covid has generated a devaluation of currencies in the historic region, as well as an increase in the prices of educational services, which had to create significant reduction schemes.

Globalization understood by Kelman & Friedman (2009) as a multidisciplinary process that modifies the factors and systems that make up a country and their relationship with the world. Together with dynamism, hyper competition, the strengthening of technology, the opening of markets, the flow of capital and innovation, they promote new scenarios for the construction of the political agenda of a country that seeks its economic development and the increase of social well-being. .

The new context of the world requires the modernization and transformation of organizations, which must be focused on strengthening their structural processes and internal and external relations actions (Wargadinata, Maimunah, Eva, & Rofiq, 2020). The new normal alters the public health (physical and mental) of the workers and the procedures of the organizations. For Armstrong (2008) and Yielder & Codling (2004), leadership and knowledge management allow the design, implementation, and evaluation of management models, oriented towards organizational learning.

Management in Education

Management is understood by Grumbine (1994), as the integral work action necessary to comply with the principles of administration. Sallis & Jones (2013) defines it as the set of specific and coordinated actions that a work group implements to achieve proposed ends. Bonstingl (1992) adds to the above, that management coordinates work processes, classifying it into roles, tasks, times and responsible.

For Thompson & MacMillan (2010) and Harvey, Royal & Stout (2003), university leaders must create new educational organizational management models that enhance the administration of their resources in opening up to new actors, horizons and markets through alliances, synergies and cooperation between entities, generating means to increase the wealth of the organizations and the fulfillment of their strategic planning. According to DaSilva & Trkman (2014), a model is a theoretical representation or demonstration scheme of a system or a complex reality, which allows the abstraction and operation of its objective.

In this order of ideas, organizations need to analyze and re-potentiate their models, defined by Zott & Amit (2010), as the set of interdependent activities that transcend the very object of the organization, allowing the expansion of its borders and seeking the maximization of social benefit (public organization) or business productivity (private organization).

Organizational Management Models

According to Baden & Morgan (2010), the MGO has been the most studied concept in management today, especially in terms of strategy and business prospects. The main reason for this is the discussion of a replicable model in other areas of human development that accelerates the achievement of benefits and results.

Precisely the MGO, is the main piece in the decision of a new undertaking or a comprehensive strengthening of an organization; requiring leaders to reflect on the current context of organizations and rethink how to achieve an ideal state in the future business (Zott & Amit, 2010). For Boud & Molloy (2013) and Hooshyar, Pedaste, Saks, Leijen, Bardone & Wang (2020), the models must rethink the current situation, and seek the synchronization of technological actions and information systems that collaborate not only for the bridging the digital divide if not for a collaborative deployment of real-time solutions, as shown in the following.

INFORMATION ANALYSIS AND DISCUSSION

The scope of the research is 16 Ibero-American Universities, 6 Deans answered, and the rest were higher education institutions directors. 35% of the responses came from women, and 9 countries participated.

According to the questions the findings were:

1. Considering the guidelines explained in the theoretical framework on leadership in the education sector, people who answered the instrument with a minimum of 0 and a maximum of 10 in autonomy, decision-making power and degree of influence in their sector, they reached 8 points on average, that is, their self-rating on a leadership scale. This is important for the research because it allows first-hand evidence regarding responsibility and decision-making level in the Universities of the region.

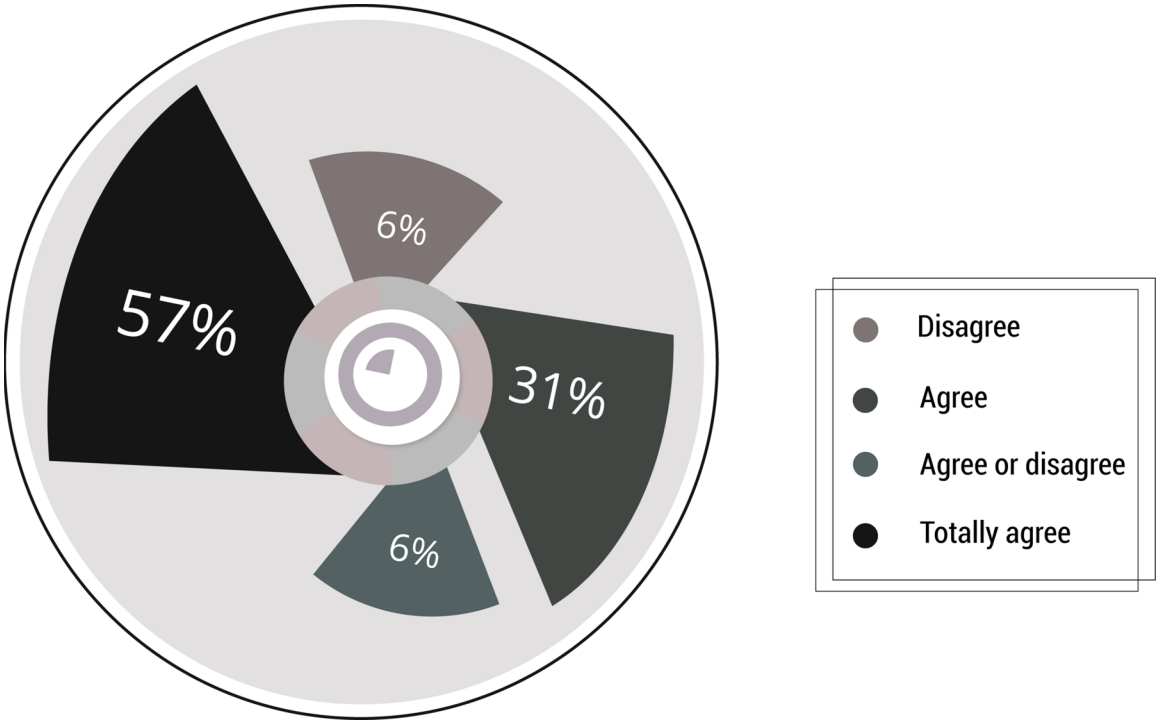
Table 2. Concepts for updating MGO

Items	Description	Description
1	Outside in	Organizations must change the perspective that the business model is created from the internal competencies of the organization, it is on the contrary that clients define and outline the structure that the organization must implement in order to meet their expectations
2	Models cannot be anticipated in advance	Organizations must learn over time, which emphasizes the centrality of experimentation in discovery
3	Appreciation of the dynamism of competitive advantages	The organization should not be content with generating temporary competitive advantages, it is essential that firms have internal innovation processes to encourage advantages that are sustainable and that accelerate the improvement of each of the organizational areas.

Source: Author's own elaboration based on McGrath (2010), Boldureanu, Ionescu, Bercu, Bedrule-Grigoruță & Boldureanu (2020) Shehzadi (2020), Valdivieso & Vargas (2020) y Azorín (2020).

2. Regarding the question, "Describe how you are perceived as a leader during COVID-19 pandemic in the education sector?" We established that 60% indicate that despite the crisis caused by the economic, social, cultural and health situation, they were able to develop strategies that allow managing the problem, using technology, exploring new means of communication among the academic community, approval of tuition deferrals and financial allowances for students. On the other hand, 25% indicate that their actions have not been enough to alleviate the consequences, especially economic, so they foresee a crisis that could place the University in total instability, since there are loses for the end of the period. Others surveyed answered they remained on the sideline, seeking to comply with their initial planning, based on their technological platforms and their initial course.
3. For the question, which have been the purposes of your leadership in the framework of the SARS COV 2 pandemic? In a general, universities directors and deans answered that their main purposes have been: 1) Consolidating flexible educational strategies that tend to preserve human life by self-care, collective protection and monitoring systems, 2) Being an example of positivism, creating communication channels where motivation and persistence are the basis for new connection mechanisms between students and university teachers.
4. Rewiwing the actions developed by the population under study, we established that 30% are aimed at reducing the capacity of education facilities seeking virtual and safe scenarios, 23% develop exercises that seek reorganizing plans, curricula, and study modules, understanding the need for an update current circumstances and the post-pandemic processes. The other actions are evenly distributed between creating new lines of communication and student management, developing conventional activities and functions, organizing new work plans, and simplifying teachers and administrative staff
5. In a separate analysis, the relation of compliance with objectives and actions developed around planning processes based on the pandemic, the results are as follows in figure 2:

Figure 2. Objectives compliance vs. activities presented during COVID-19 pandemic
Source: *Author herein (2021).*

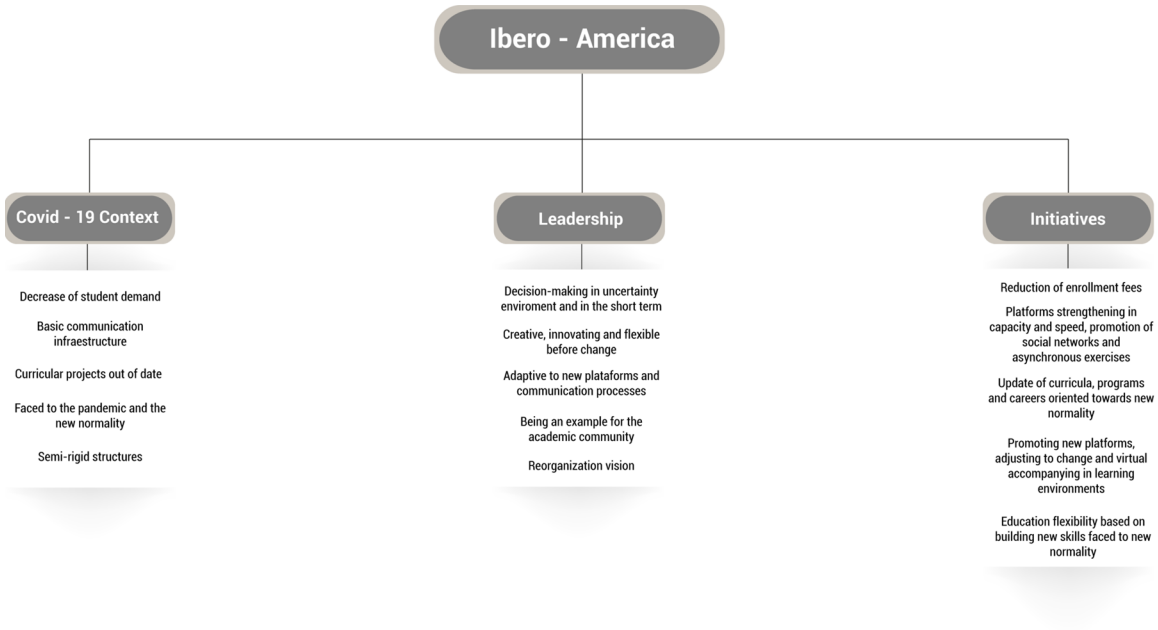


6. f) To keep a positive dynamic in work groups with their respective state of mind, people who answered the survey recommend 5 minutes active breaks every 45 minutes, holding meetings that do not last more than 2 working hours, developing activities allowing constant two-way interaction, use of social networks as new coordination mechanisms and decreasing activities which do not create value to the context.
7. g) In the new normality, information technologies have modified the structure and communication channels among those involved in training processes. Most frequent strategies are social networks, videoconferences on Meet, Zoom and video calls. Most common topics are keeping the institutional community informed about economic activities, student support offers or services, prevention and biosafety schemes and strengthening trust in virtual pedagogical processes.
8. h) Students' response to the new dynamics, tools and interaction with teachers, has been positive in a 75% when new, interactive strategies that involve the entire community are achieved. It is evident that directors and deans agree that creativity, innovation and breaking pedagogical paradigms have been a constant practice, and curricula renewal, class preparation and even the student's assessment have allowed establishing adequate learning processes, especially in postgraduate and extension programs.
9. Feedback processes between students and work teams concerning new teaching dynamics are carried out in 90% of the universities studied; directors and deans refer that it is positive in 60% of the cases, middle level in 35% and negative in 15% of the cases. This last indicator is linked to

assertive communication by teachers in the virtual classroom and the appropriate use of tools for knowledge building through platforms use.

Once the proposed results were analyzed, a focus group was developed to create a decision-making model by leaders in education sector in Ibero-America, identifying COVID-19 Context, Leadership, and Initiatives components. The following graph presents the direct connections between variables that describe the processes of each component and the respective interconnection. The leadership model is in the figure 3:

Figure 3. Leadership model in education sector during the pandemic
Source*: Authors herein (2021).*



The model shows how each of the variables of the 3 components are related and therefore subject matter of assessment in a sample of 30 universities, during the 2021 term, in Ibero-America. Covid-19 context is established by the decrease of student demand, university basic communication infrastructure with incapacity to offer high-speed connections and to interact with hundreds of students at the same time, curricular projects short to address a public health situation of these dimensions; on the other hand, we found that learning spaces have to address the challenges of the new normality and the organization structures are not very flexible faced to virtuality, especially for traditional subjects that use in person and contact schemes, such as biology, chemistry, physics and communication sciences.

The leadership component by deans and directors is making decisions in environments of uncertainty in the short term, as well as being creative, innovative, and flexible faced to change, adapting to new technological platforms, and for example, building confidence in digital transformation, changing the

vision of the university with new teaching paradigms and synergies between professors, students, and the knowledge.

Finally, the initiatives of the leaders in the universities have been aimed at reducing student tuition costs, new scenarios to ease credits or encourage scholarship schemes in time of the pandemic. On the other hand, a lot of money has been invested in strengthening technological systems, digital platforms and use of social networks as learning mechanisms. The foregoing allows developing new digital content, academic programs updating and design of new subjects allowing promotion of new skills for students, in order to satisfy challenges of the new normality.

This theoretical model has been discussed in different scenarios, with experts; during 2021 the processes are taking place to validate it, building a scheme that represent the governing body of the region's universities, in the context of the pandemic and its effects on the education sector. Achieving validation of connections between the variables of the 3 components shall be an important contribution to continue improving the educational system and foster bases for dynamic teaching processes and better relationships among the members of the academic community

The model shows how each of the variables of the 3 components are connected; the model is the subject of assessment in a sample of 30 universities, during 2021, in Ibero –America, the model is in the figure 4.

Figure 4. Mushin model for universities in times of pandemic
Source: *Authors herein (2021).*

In the previous image you may see the three axes of the Mushin leadership model; leadership exists regardless of the leadership style exerted, the existence of the actor or leader endowed with power is

essential as well as leadership actions, actions to maintain control of the environment, achievement of the objectives and recognition of the context, specifically the SARS-COVID 2 pandemic.

The power comes from different sources as suggested by John French and Bertram Raven, realizing that power in organizations comes from five sources: i. Rewarding power, from the ability to assign rewards and incentives to work teams. ii. Coercive power, such as that obtained from the possibility of sanctioning behavior or results of the team within an organization. iii. Legitimate power, from team's recognition of the superior's ability and influence, backed by social norms or authority. iv. Expert power, due to the possession of knowledge, experience and intellectual capacities in a relevant way and v. Power of reference, leader's ability to become an example to emulate. Later, vi and vii sources of power have been added: vi. Contacts or connections and vii. Information: ability to influence due to information resources.

The Mushin model for universities in times of pandemic becomes an ideal scenario to continue studying the relationships, paradigms, actors, and strategies that universities in the region require to face the crisis, moments of chaos, and uncertainty. Organizations need to learn to coexist and handle chaos, as a natural and constant element in the development of educational processes. In the same way, Leaders, Directors and Program Directors require the highest levels of digital updating, which allow them to continue transforming teaching channels.

CONCLUSION

Leadership in chaos management by university leaders in times of pandemic and economic recovery in Ibero-America allows identifying transformation and modernization processes of Higher Education Institutions. Each of them is mainly featured by the strengthening of skills and information systems for virtual teaching, adjustments of the education community and the need to make traditional learning channels more flexible.

The components of current education are Covid-19 Context, Leadership, and Initiatives. The first component presents common conditions in education that different leaders have evidenced in their daily processes; second is Leadership, represented by i: leaders, that is deans and directors of these Universities, ii: leadership actions for chaos management and initiatives mainly used and iii: situational context.

Chaos is understood as disorder and confusion. In organizations, it is posed as part of the challenges that must be avoided to achieve the maximum levels of productivity and effectiveness. However, chaos theory states that irregularity and dynamism are inherent properties of organizations, and that they become unpredictable elements for managers. Therefore, decision makers need to adapt to these realities continuously and turn them into opportunities for organizational positioning and growth.

For Dolan et al (2003) this theory allows organizations to transform through chaos and order, order, and chaos respectively. COVID-19 in the education sector has generated a re-conceptualization of the university system in Ibero-America, creating spaces for pedagogical innovation, asynchronous collective learning processes, use of platforms, information systems and construction of unprecedented learning processes in the region. University managers in general, have managed to adapt to these circumstances, which invite them to develop strategies to achieve better levels of coverage and quality of the same.

The research allows concluding that the incorporation of technology and the flexibility in education are the pillars of knowledge building processes. Leaders in education have sought biosafety protocols,

motivational strategies and educational activities that guarantee compliance with academic programs as well as knowledge demand in times of crisis.

The model proposed in the research presents an opportunity to analyze the main components in the management of chaos in universities in times of the pandemic. The actors, their actions and the context generate a series of concepts that describe the processes of adaptation and transformation of leadership in universities in the region

Studies in the management of chaos for the education sector become a constant input for reflection, adaptation, planning and adaptation of systems, platforms, tools, information systems and pedagogical material for teaching

On the other hand, there is the high availability and receptivity by students and work teams to participate in changes at universities, recommending assertive communication, use of friendly pedagogical tools and active participation in class. Finally, a conceptual model is created based on the results of the research by the group of experts and the information obtained in the surveys, validated in 30 universities in the region, which demonstrates in quantitative manner connections and significance.

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Chapter 14
Managing Human Resources as a Business Strategy in Times of Disruption

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ABSTRACT

This chapter establishes a tripartite relationship of high impact and validity in the business world. The three concepts that are intertwined are the management of human talent, the concept of disruption, and business strategy as drivers in organizations that seek to fulfill the visionary unit that has been proposed in the existing conditions of a particular environment that presents new movements, questions, and events derived from factors such as public health, the fourth industrial revolution, caring for the environment, generational social interaction. Once the concepts described above have been understood, the authors proceed to establish the relationship that allows them to intertwine and find the points of convergence so that they can have the proposal to manage human talent in times of disruption as a business sustainability strategy.

INTRODUCTION

This chapter, managing human talent as a business strategy in times of disruption, establishes a tripartite relationship of high impact and validity in the business world. The three concepts that are intertwined are the management of human talent, the concept of disruption and the business strategy as drivers in organizations that seek to fulfill the visionary unity that have been proposed in the existing conditions of a particular environment that presents new movements, questions and events arising from factors such as public health, the fourth industrial revolution, care for the environment, generational social interaction from the meaning of sustainability.

The relationship of these three concepts intends that entrepreneurs, managers, academics and other stakeholders observe the importance of developing, motivating and maintaining the appropriate people in order to guarantee a productive and competitive path in organizations that travel in contexts of per-

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manent movement and uncertainty, they experience irreversible processes that ultimately lead to what is not expected or not projected and, nevertheless, can generate environments of business sustainability.

The approach to these issues begins by establishing what is related to the concept of disruption and its respective contextualization at this time, that is, which factors can be considered that provoke or derive in the enabling conditions in times of disruption. Next, a description of the global trends on business human capital is made, the appropriate elements and conditions to consider in the management of the multivariate available human talent, the characteristics of human talent are presented considering that today different generations coexist in it. job context. Subsequently, the elements that are supporting the tendency to establish social enterprises are reviewed.

Once the concepts described above have been understood, it proceeds to establish the relationship that allows to intertwine and find the points of convergence so that can have the proposal to manage human talent in times of disruption, as a business strategy aimed at fulfilling the purpose. vision of organizations.

METHODOLOGY

A literature review was carried out using primary and secondary sources through academic databases of authors and their respective research, in addition to the review of documents from prestigious multilateral entities. Once the concepts were established, the meeting points that would allow the construction of the relationship proposal between them were analyzed, in order to establish a proposal that serves for companies to guide their organizational strategy considering managing human talent in a way that seeks business sustainability in times of disruption.

THEORETICAL FRAMEWORK

Disruption and Turbulence

Being respectful to those who precede on this issue, it is appropriate to present different positions of reputed authors who have studied about it. Therefore, from different stages, a brief overview of the different meanings of disruption and turbulence depending on their applications is made. It can be indicated in a general approach that disruption can be understood as the lived experience of irreversible processes that ultimately lead to the unexpected or not projected. Next, in Table 1, concepts of disruption are presented, what is found in the literature on the interpretation of the meanings of disruption is expressed.

Both (Laverde-Verástegui & Rivera-Rodriguez, 2016) and Hu, Y.; Li, J.; Holloway, L.E. (2008) are coincident in pointing to the deplorable consequences that an organization that is impacted by a disruptive event is exposed to. Generating with this, instability, sudden changes and even the disaster of disappearance so fast that even, alone, desolation will be the feeling experienced among the organization's stakeholders.

The other coincident element found in the sources and that ratifies the express approach by the author of this document on disruption, is the condition of being sudden: unexpected, unthinkable, unforeseen, sudden, unpredictable. Highlighting that this condition makes management theories that promote planning and organizational projection face the question of how to address the so-called disruptive events. That is,

Table 1. Concepts of disruption

Author	Description
(Laverde-Verástegui & Rivera-Rodriguez, 2016)	"the occurrence of one or several unexpected events that arise suddenly, within a limited space of time and, whose strength is such that it manages to cause a degree of destabilization sufficient to jeopardize the existence and continuity of the company."
Hu, Y.; Li, J.; Holloway, L.E. (2008) en (Sanchis & Poler, 2011)	"Disruptive event is a situation that will result in the partial loss of network components or that will render some of the connections between components unusable in a short period of time and that can cause a significant impact on the economy, so that the company need to reconfigure your network."
(Vidal, Carmota, & Rodriguez, 2019)	"Is used to define a decisive or abrupt change. Then, the technology that fosters profound changes in processes, products or services is a disruptive technology and generally entails an introduction, penetration and use strategy that consolidates it and displaces the previous technology, which makes it a disruptive innovation. This innovation becomes an advance that makes the old seem archaic in terms of its benefits and is incorporated into new forms of action and social thought "
(Martinez, 2019)	"Disruption is an alteration of statism that cancels the future, that is, it opens and starts the condition of change: the possibility of different futures. Disruption is also openness and possibility; however, it can be ephemeral when reflection on what is questioned and broken, on what conceptually catalyzes the revolutionary is absent. "
(Sanchis & Poler, Origins of Disruptions Sources Framework to Support the Enterprice Resilience Analysis, 2019)	To refer to disruption in the business context is to understand it as the disturbance with negative effects for the company that has an origin that causes it, an event that causes it to be activated and to consider the consequences that remain of the alteration of the normality that the company had.

Source: self-made

the projection of future stages vs the possibility of events that may occur suddenly or unpredictably. Today, these types of events tend to be more frequent and are putting different organizations in risky positions.

Now, it is found that Hu, Y.; Li, J .; Holloway, L.E. (2008) cited by por (Sanchis & Poler, 2011) indicate that disruptive events could be classified into three groups as indicated in Table 2, Classification of disruptive events, making it clear that the author of this document add other events to the list, expanding the classification.

Certainly, whether the origin of the disruptive event is caused by natural catastrophes, accidents or deliberately caused by human beings, the consequences for people will be of high caliber depending on their degree of relationship with each event. That is, its level of geographical proximity in the case of natural disasters, its proximity to the possible source of the accident or, proximity of those who are causing the situations that trigger the deliberate disruptive event.

In the same way, whatever the type of event, the impact on organizations will also be reflected as mentioned above. In addition, the impact will vary depending on the size, the stage of the life cycle that the organization is going through, the economic sector where it is located and the market conditions given at the time of the event. Therefore, although disruptive events will generate imbalances, interruptions, turns in the daily life of the affected companies, it will not necessarily mean that the impacts are of equal similarity for all organizations and consequently their repercussions.

Table 2. Classification of disruptive events

Natural disasters	Accidents	Man-made situations
hurricanes	fires	terrorism
floods	power outages	wars
storms, tornadoes	equipment failure, machinery	epidemics, pandemics
earthquakes	water dam failure	sabotage
tsunamis	pandemics	strikes
Volcanic eruptions	nuclear plant leaks	economic or financial panics
other events of nature in each region of the planet	other situational events that did not have adequate prediction and prevention plans based on risk studies.	other events created intentionally by people who, knowing the implications, caused them

Source: prepared by the author from: Hu, Y.; Li, J.; Holloway, L.E. (2008) cited by (Sanchis & Poler, 2011).

Considering what has been described, it is appropriate to consider the concept of turbulence, closely related to disruption, therefore, it is necessary to make an approximation.

For the purposes of this document and with the aim of having a successful approach to the concept of turbulence in terms of organizational management, it is appropriate to establish a comparison of some scholars of this topic on their interpretations, below, in Table 3 Concepts of turbulence, some approximations.

Disruption and turbulence, two concepts that describe the current conditions in which the world is moving. Indicating that for the purposes of this dissertation it is considered that both terms can be used in a similar way, it is clear that when it refers, it is intended to specify the meaning according to the sense of its use.

Now, disruption and turbulence must be considered in the current organizational situation due to the impact that they generate in the present and next future of any type of company, whether public or private, large or small, in the food, energy, services sector, just to name a few.

Consequently, disruption and turbulence are variables to consider when it comes to considering the management of human resources, in terms of their soft skills: their levels of adaptation, resilience, reaction to the changes generated and, on the other hand, the skills known as hard: specific knowledge and experience achieved in accordance with the needs of the changes generated.

Concomitant Factors

In the next part of the document, four factors are addressed which, because they are of global significance and of the first transversal line in the business context, are considered critical and highly relevant to the changes that organizations are experiencing due to the uncertainty in the face of the possibility of unexpected events. These impact organizations directly, and in turn, are capable of provoking immediate reactions or that have to be considered to incorporate contingency plans that allow the outlining of structured actions that somehow manage to mitigate consequences in a better way than, not having had at least a basic data on the existence and behavior of such events.

Table 3. Turbulence concepts

Author	Description
Emery y Trist (1965)	"instability or underlying rate of change in the organization's environment; it is a situation where resources and constraints are constantly changing, forcing companies to react."
Terreberry (1968)	"It is characterized by an accelerated and complex rate of interactions that the company presents, exceeding its ability to predict and control the consequences of its actions."
Galbraith (1973)	"it originates from economic growth, scientific advances, and modern communications systems."
Khandwalla (1976/1977)	"it is characterized by rapid and unpredictable changes in many aspects of the environment."
Ansoff (1979)	"It is the raison d'être of management, and that it was in the leader to manage the surprises and discontinuities typical of this condition."
Dess & Beard (1984) y Bourgeois & Eisenhardt (1988)	"turbulent environment presents a high degree of sporadic changes generating uncertainty and difficulty in prediction."
Waterhouse (1992)	"it is a state, which is achieved when there is a high degree of complexity and uncertainty, accompanied by a low level of prediction, autonomy and control."
Dante (2002)	"turbulent environment such as one in which a series of abrupt and unpredictable changes take place that impact destabilizing the system in which the company operates, hindering its ability to adapt."
Calantone, Garcia & Droge (2003)	"A turbulent environment is one in which there are frequent and unpredictable changes in the market and technology that affect the development of new products."
Camillus y Datta (1991); Grant, (2003)	"a changing, volatile and unpredictable environment."
Caldart & Ricart (2006)	"It is a consequence of the difficulty that many industries have in reaching a congruent vision of the external conflicts with which they face."
Buganza, Del'Era & Verganti (2009)	"indicates the level of variability of the state of the environment, which depends on its dynamics and complexity."

Source: prepared by the author from: (Porporato, 2015), (Rivera, 2010)

They are the following factors on which you want to make a presentation of each one and its impact with the work of organizations: Public health, the fourth industrial revolution, the environment - sustainable development, generational social interaction. Then, proceed to the description of each one of them.

Public Health

In the first instance, the two definitions on public health that have been expressed by the World Medical Association - WMA and the Pan American Health Organization - PAHO are described, in order to have a starting point as to what the affectation of public health in the work of companies in current turbulent times, there is a presentation of the assessments of two renowned organizations with worldwide coverage.

According to the (Asociación Médica Mundial, 2021) public health is understood as the care and promotion of health applied to the entire population or to a specific group of the population. WMA points

out that: today public health analyzes a whole range of health determinants and concentrates on promoting health and adopting preventive measures. It adds that: it is necessary to consider public health from a general perspective that, in addition to including contagious diseases and health, should include the social determinants of health, non-communicable diseases and lifestyles. Finally, the WMA in relation to public health indicates that: it deals with the control of pandemics, anti-smoking, harmful abuse of alcohol, nutrition, obesity and physical inactivity, and multidrug-resistant tuberculosis.

Now, the (Organización Panamericana de la Salud, 2020) in the document called, The essential functions of public health in the Americas: a renewal for the XXI century, affirms that: public health is the practice and field of knowledge of action collective state, together with civil society, to protect and improve people's health and guarantee the right to health of the population. Additionally, PAHO indicates that: population and individual actions to promote health, prevent diseases, pay attention to disease (diagnosis, treatment, palliative care, and rehabilitation) and offer short-term care are constituted as comprehensive public health services, medium and long term necessary. Complementing, PAHO affirms that: public health services can be characterized by identifying five levels of intervention.

At the first level, interventions focused on addressing the social determinants of health (for example, poverty reduction and improvements in education) are identified; in the second, interventions that seek to change contextual factors that affect health (for example, access to safe drinking water and roads); in the third, protection interventions with long-term benefits (for example, access to immunizations and screening services); in the fourth, individual care; and finally, at the fifth level, health education interventions, usually managed from health facilities, to promote changes in behavior (for example, increasing physical activity and adopting healthy diets).

Regarding public health, it was wanted to bring up in a timely manner the dimension of the meaning of public health from two perspectives, although related, each one with the intention of seeking clarifications regarding this issue that today is fully valid on behalf of the Covid-19 pandemic that is affecting humanity and that for the purposes of this document is to be made aware of the impact that its implacable effect has generated on all companies on the globe.

In this sense, the (World Health Organization, 2021) - WHO, at the closing of the 74th World Health Assembly, issued more than thirty resolutions related to public health. For the purposes of this document, the total interest in putting an end to the Covid -19 pandemic and, additionally, preventing what may be the next one is highlighted. The WHO Director General affirms that a healthier, safer and fairer world must be built.

At the 74th World Health Assembly, two issues of high importance are highlighted, the first one affirms that a generational commitment must be reached that is above the budget, electoral and other cycles, which allows connecting the political mechanisms financial and technical resources needed to strengthen global health security. The second issue refers to the vital importance of the mental health of the population seeking psychosocial support and mental health itself; in fact, there is a comprehensive mental health action plan 2013-2030.

When observing the relevance that health has acquired and especially public health due to the implications and impacts that Coivd-19 has generated in all levels of society worldwide, it is necessary to consider how this global phenomenon has also touched one of the fundamental social axes for the development of people, that is, business organizations, which are a source of employability, social and economic growth, drivers of productivity and competitiveness and, which today are thinking their work and commitment in a new model of sustainable development of a global order. For the management of human resources as a business strategy, it is essential to consider, in each of the organizations, health

conditions as a business policy, accompanied by concrete and effective plans that go beyond what is stipulated as labor regulations in each country.

Fourth Industrial Revolution

The second factor to deal with is the so-called fourth industrial revolution or also known as Industry 4.0, with the particularity of being an avalanche of innovations combined between physical and digital technologies, entering not only the business productive apparatus but also all members of society without I distinguish between race, socioeconomic status, gender or age. This section will detail its accelerated penetration in communities and the impacts on development and business activities.

(Deloitte Insights, 2018) in his article called the fourth industrial revolution is here- are you ready? reflects the results of a survey of more than 1600 executives from 19 countries in America, Asia and Europe on Industry 4.0. The results are conclusive on the panorama that is observed on the exponential penetration of the fourth industrial revolution.

(Deloitte Insights, 2018) states that: a newcomer idea can disrupt an established industry, or a broad set of digital data augmented by artificial intelligence and sophisticated models can rival the experience gained from many years of hands-on experience. It points out that: Industry 4.0 represents the ways in which smart, connected technology is embedded in organizations, as well as in people's daily lives. In addition, it points out that: this revolution in digital and physical technologies also creates enormous possibilities - but it can also change the status quo and create almost as much uncertainty as opportunity.

The research results of (Deloitte Insights, 2018) focused their attention on the following aspects: social impact, strategy, talent and workforce and technology. Four highly relevant perspectives for anyone responsible for business management and their purpose for moving the organization forward in times of disruption and turbulence. Of course, the great paradox is that this fourth industrial revolution, in itself, is disruptive and turbulent, thus causing organizations to find themselves on a circular and two-way path where they are impacted by an external factor that in turn and simultaneously it becomes a resource of the organization. The genius of entrepreneurs and managers lies in developing the necessary skills for the correct administration of an externality that is nested as a resource and that may or may not generate value in organizations.

Additionally, it is appropriate to bring up the declaration on the universal purpose of companies in the fourth industrial revolution in the framework of the 50th meeting of the World Economic Forum held in the City of Davos in 2020, known as the Davos 2020 Manifest. (Word Economic Forum, 2021) sends a direct message and with a sense of commitment to companies in the world about their role in the face of Industry 4.0, in the following Table 4 a refinement of the Manifesto is carried out, guiding the relevant aspects of interest in this document on the management of human talent in times of disruption.

Environment - Sustainable Development

The third factor is the so-called Sustainable Development, for this the review is made from the 2030 Sustainable Development Agenda promulgated by (United Nations General Assembly, 2015) in its general assembly of 2015 affirms that: it is an action plan in favor of people, planet and prosperity. It refers to who are the responsible participants, in this sense, it makes it clear that private business participation is essential from multinationals to small companies. Additionally, the 17 Sustainable Development Goals

Table 4. Universal purpose of companies in the fourth industrial revolution

Postulate	Description
"The purpose of companies is to collaborate with all their stakeholders in the creation of shared and sustained value."	- "Treating your staff with dignity and respect." - "Respecting diversity and striving for continuous improvement of working conditions and the well-being of employees." - "Interceding for continuity in employment through continuous improvement of skills and the acquisition of new ones."
"A company is more than just a wealth-generating economic unit."	- "Attending to human and social aspirations within the framework of the social system as a whole." - "Noting that executive staff salaries reflect responsibility to stakeholders."

Source: prepared by the author from: (Word Economic Forum, 2021)

- ODS are established, it should be noted that there are 169 related goals of an integrated and indivisible nature. Next, Table 5 presents the SDGs grouped into the three dimensions of sustainability.

Table 5. Sustainable development goals

Social Dimension	Environmental Dimension	Economic Dimension
3. Health and Wellbeing 4. Quality Education 5. Gender Equality 10. Reduction of Inequalities 11. Sustainable Cities and Communities 16. Peace, Justice and Strong Institutions	6. Clean Water and Sanitation 7. Affordable and Clean Energy 13. Climate Action 14. Underwater Life 15. Life of Terrestrial Ecosystems.	1. End of Poverty 2. Zero hunger 8. Decent Work and Economic Growth 9. Industry, Innovation and Infrastructure 12. Responsible Consumption and Production

Source: prepared by the author from: (Word Economic Forum, 2021)

Therefore, it is key to involve all the members of the companies beyond the awareness and knowledge of the meaning of sustainable development, in undertaking a programmatic path for the development of competencies in all the employees of the organizations so that their contribution Real allows mitigating and eliminating the actions that are causing the accelerated deterioration of the environment and its corresponding impact on the other two dimensions.

Intergenerational Interaction

Finally, the fourth concomitant factor that is considered is the generational social interaction that occurs in organizations and that today, due to the rapid changes, is appropriate to review. Some organizations that are more sensitive to observing and analyzing the behavior of their collaborators are finding it important to review the implications of coexistence of several generations in their organizational structure. Realizing this situation brings with it several situations with respect to the collective capacity to face disruptive events and assume them with integrity and the willingness to move forward.

Before expanding on the above, it is important to make a description of the characteristics of the different generations that today can be in organizations. For this, in the following Table 6 a comparison of the generations found is observed.

Table 6. Characteristics of the present generations

Generation name	Born in range of years	Characteristics
Silent	1928 - 1945	"Delivered to carry out a task of rebuilding the nations affected by the two world wars."
Baby Boomer	1946 - 1964	"Dedicated and addicted to work. Empowered. They seek status, loyalty, and quality of life."
X	1965 - 1980	"Cynical, distrustful. Materialists and consumerists. Individualistic, and at the same time inclined towards group support and mentoring. Practical, pragmatic. Seekers of personal and organizational goals, balance between work and personal. They value being recognized."
Y o Millennials	1981 - 1996	"They are multicultural. They seek work flexibility and pleasure at work. They embrace diversity. Of minor political and religious affiliations. Connected to social networks. They prioritize personal interests over those of organizations. They need ongoing feedback and they need professional growth."
Z	1997 - 2004	"Adaptable to work environments. Digital natives even in their work, social, cultural and other stages of life."

Source: prepared by the author from: (Brosdahl & Carpenter, 2011); (Dimock, Pew Research Center, 2019); (Diaz-Sarmiento, López-Lambrano, & Roncancio-Lafont, 2017); (Almaguer & Cervera, 2018).

It is vitally important to realize that people of different ages coexist in organizations who, like it or not, have certain particular characteristics that identify them as particular generations. Each of these generations has been motivated and influenced by the realities experienced in its growth and formation process in accordance with the events that have surrounded it, be it political, religious, social, cultural, economic. With this, their worldview, the way they face life, interpersonal relationships are reflected in the behaviors of the different stages of life, be they academic, family, social or work, among others. This last aspect, the labor one, must be considered for the purposes of this chapter. How to achieve and take advantage of multigenerational interaction in the workplace beyond the particularities of each generation?

Human Talent Management

In this section, for the purpose of the intentional development of this document, two components are proposed to consider with the management of human talent, global trends on human capital and the skills to be developed in human talent. Within each of these topics, what is relevant is deepened for its understanding and link with the general purpose of the chapter.

Global Trends on Human Capital

First of all, want to place special emphasis on the path of different trends that have been developing worldwide on human talent and its leading role in organizations. Therefore, a review is made of what was expressed between the years 2017 and 2020 on human resources. For this, the annual reports that the international consulting firm Deloitte has been preparing are taken as a basis, these reports derived from periodic studies and the approach to different business leaders from different economic sectors around the world. This comparison is accompanied by other global studies and by some authors who are introduced according to the topic in which it is desired to specify a particular aspect.

In this review of global trends in human capital, the first finding is that the fourth industrial revolution / Industry 4.0 and the concept of social enterprise are the transversal axes and at the same time the referents on which global trends gravitate. For the purposes of better methodological understanding and thematic ordering of trends, a description is made for each year. For the year 2017 the trends are grouped and presented in five perspectives of organizational management. The first has to do with the redesign of the organization and its leadership in the future, the second with the construction of an organizational culture of learning, adaptability and growth, the third perspective unifies the collective exercise of management to consolidate and empower teams. the fourth refers to the individual on the way to strengthen commitment, productivity and their development, finally, the fifth perspective brings what is pertinent to the relationship of technologies at the service of improvement at work, both in its contents and in its forms, (Deloitte University Press, 2017). Table 7. shows the trends consolidated by the organizational thematic perspectives.

Now, being consistent in the way of presenting the information on human capital trends, the following is a summary of the 2018 Deloitte report. This year, the theme that focuses attention as a general conclusion is social capital that derives from the purpose of organizations and relationships with stakeholders to build social enterprises.

(Agarwal, Bersin, Lahiri, Schwartz, & Volini, 2018) state that: a social enterprise is an organization whose mission combines revenue growth and profit making with the need to respect and support its environment and the network of parties interested. In addition, they indicate that: it is an organization that assumes its responsibility to be a good citizen (both inside and outside the organization), which serves as a model for its peers and promotes a high degree of collaboration at all levels of the organization.

Considering the above and to facilitate the presentation of the ten trends, these are set out in Table 8 Global trends in human capital year 2018, it can be seen that the trends have three main threads: one focused on the attention of the individual, the second on the social contribution of the organization and the third to the use of technology in the sustainable growth of the organization.

For the year 2019, the study carried out on 10,000 executives in 119 countries determines a clear line on the social enterprise in its reinvention with a human approach oriented to learning in the work experience. Table 9 shows the trends classified into three categories.

Finally, this tour of the considerations of leaders of organizations around the world is completed, who conceptualized the importance of reviewing where the management of human talent should turn and which are those external and internal agents that become trends in business behavior and its intimacy with the main resources that companies must have today, not only because of their key contribution to the success of organizations, but also because of the social commitment to consider the people who serve the purposes of companies as integral human beings . Table 10 presents the consolidated of the central ideas of the study of trends grouped by attributes of the year 2020.

Skills to Develop in Human Talent

After conducting a review of the competencies that could be considered appropriate to relate to the purpose of this chapter, the author consider it appropriate to present three of the different and interesting skills that anyone immersed in the business world can develop. The previous selection is derived, of course, from the theoretical construction immersed in the document, that is, it is not due to chance, but is supported by the content developed throughout this study. considered the most pertinent in their

Table 7. Human capital trends in 2017

Organizational perspectives	Trends	
	The organization of the future	**Disruptive leadership**
Redesign of the organization and its leadership in the future	The organization cannot remain isolated, understand that organizational ecosystems and networks must be built. Move from hierarchically rigid organizations to empowered team and network structures that are able to act quickly.	Leadership needs to change as digital organizational models emerge. Managers consider the importance of leadership. Agile, diverse and youthful leadership with a clear digital disposition is needed that can sustain itself in a rapidly changing world.
	Career and Learning	
Organizational culture of learning, adaptability and growth	Continuous learning for building skills quickly and easily and with your own conditions and plan. Each employee becomes the director of their own particular career plan: skills training, experiences to live and roles to assume.	
Management to consolidate and empower teams	**Performance management**	**Diversity and inclusion**
	Agility in the management of objectives, scheduled and periodic review and constant feedback and coaching, in real time with the purpose of retraining for rapid management and improvement of communication. Strengthen individual performance to improve team results.	Focusing on global cultural diversity, employees welcome considering diversity and inclusion within corporate culture. If organizations begin to operate through networks, then the incorporation of these issues into business practice is facilitated. Diversity and inclusion considered a component in the work and is promoted from the high direction.
	The employee experience	
The individual on the path to strengthening commitment, productivity and development	The employee must have productive and enjoyable work experiences that generate commitment. Strategies such as your own workplace, management practices such as feedback, wellness programs, your own exercise to build your career plan. The search for the balance of personal and professional avid. The alienation of personal goals and corporate purpose.	
Relationship of technologies at the service of improvement at work, both in its contents and in its forms	**RH Digital**	**The future of work**
	Human Resources - HR as an ally in the digital transformation: digital workforce and digital workplace.	Evaluate how each job can change, it is necessary to define its adaptation or elimination in case of being replaced from technological innovation.
	Talent acquisition	**Talent analytics**
	Building an employer brand as a candidate attractor. Cognitive and artificial intelligence, social collaboration and the sharing economy redefine the workforce.	High investment in programs for planning the needs of human talent, as well as obtaining data for talent management.

Source: own elaboration, from: (Deloitte University Press, 2017).

intention to deliver a message about the best way to manage human talent in times of disruption. In this section, three competencies will be addressed: innovation, adaptability and resilience.

Innovation

The first competition to deal with is innovation, it is prudent to have several definitions of innovation at hand, each of them from different perspectives. In table 11: innovation and perspectives, there are some definitions of a concept that today due to the rapid and constant moments of change in the framework of the concomitant factors are of special interest to consider.

Table 8. Global trends in human capital year 2018

Trends	
C-suite	**The workforce ecosystem**
Understanding as C-Suite the team of senior managers of an organization, it must behave like a true team that has a multifunctional vision, extreme connectivity and strong collaboration between its members to address challenges in a coordinated and agile way. C-Suites must lead their teams in replication of their experience.	Make use of the workforce external to the organization, of course it is working to find strategies to align the organizational culture and management practices with this population extrinsic to the organization. This external labor resource can be seen as contractors, freelancers or self-employed workers.
New rewards	**From career to experiences**
The power that workers are reaching as individuals is on the way and this to request personalized, agile and holistic rewards under the concept of fair and open payment. In short, personalized models are being experimented: individual preferences, continuous and flexible.	Unlike development career plans throughout the working life, continuous and shorter cycles are being experienced to achieve experiences, new roles and new challenges. This is key, at a time when Industry 4.0 demands skills consistent with its development and it is necessary to attract an appropriate talent.
The longevity dividend	**Citizenship and social impact**
The population with a longer life expectancy than in previous times is seen as an opportunity. This from the labor point of view is a challenge to take advantage of the experience of the elderly in the interaction with the young people who enter to work.	Consider and incorporate social commitment in the higher purpose of organizations with issues such as diversity, equity, inclusion, inequality, immigration, climate change are factors that can leave good reputational and economic returns.
Wellness	**Artificial intelligence - AI, robotics and automation**
In times where work life and personal / family life intertwine and overlap in their times, oriented programs for physical, mental, financial and spiritual health are more a responsibility than a wellness strategy.	Skills in solving complex problems, cognitive skills and social skills are the most relevant in the face of the arrival of AI, robotics and automation.
hyperconnected workplace	**People data**
Both new communication tools, as well as data processing tools, are entering the market in general, they must be used to use them from a business point of view. It's not just about being hyper-connected, it's about being hyper-productive.	Exponential increase in the availability of people's data means that companies quickly establish policies in the handling of this type of information in such a way that the levels of security, transparency and communication of the appropriate use that this invaluable information must receive are managed.

Source: own elaboration, from: (Agarwal, Bersin, Lahiri, Schwartz, & Volini, 2018).

Having the four approaches to innovation from the perspectives: business, social, education and organizational, makes it possible to understand the great responsibility that companies have regarding the training of human resources, that is, enriching the capacities of all employees, especially innovation, as the spearhead of the skills that today every person must have high standards of development in order to be able to face both the causes and consequences of a disruptive and turbulent world, which is becoming more and more every day.

Innovation from the business point of view is highlighted as the process that intervenes, not only in products and services, but also in the way things are done to guarantee to offer the market something different: unique, seeking business sustainability. From the social point of view, innovation at the service of satisfying collective needs, a social meaning is imprinted on innovation in its reason for being: corporate social responsibility. From the perspective of education, it is very significant that innovation is considered a systemic activity that seeks, together with creativity, to offer the development of people oriented to always propose something new and transformative. Finally, from the point of view of organizational behavior, innovation is presented as a business development strategy, based on the synergy of different internal factors that give each organization its own identity.

Table 9. Global trends in human capital year 2019

Category	Trend
The future of the workforce	**The alternative workforce**
	Organizations seek flexibility to generate labor agreements with freelancers: paid by the hour or by the day, among others; "Gig" workers: they are paid for the performance of a task / micro task that completes a specific work phase and "crowd" workers: online talent networks, work teams that compete to participate in projects.
	From jobs to super jobs
	In the midst of the entry of cognitive technology and robotics, orient conventional work towards integrative and multidisciplinary tasks.
	Leadership
	Achieve objectives in the midst of new contexts through new competencies such as: leadership through change, management of ambiguity and uncertainty, transparency, collaboration, and understanding of technologies based on artificial intelligence.
The future of the Organization	**Trend**
	Human experience
	Make work itself a relevant experience seeking a sense of belonging, trust and experience of human relationships.
	Organizational performance
	Focused on cross-functional teams and networks improve performance. Consider the reward for team members in relation to the definition of the common goal. On behalf of a performance management around the objectives set for the team.
	Compensation
	Beyond money, the pursuit of the satisfaction of individual needs turns compensation into a personalized exercise. The above, considering the realities of the market of each company. Considering that the value that work has for each employee is more important than the same money that he receives for performing the assigned functions.
The future of Human Resources	**Trend**
	Access to talent
	The changing conditions of the environment must be considered, so that within the corporative measures are taken on the type of talent that is needed and check if there is availability in the market with the required skills and, at the same time, the internal review of employees with appropriate or developing skills.
	Learning
	People must change the way they learn. Considering that learning is more incorporated into work on account of the permanent changes that are occurring and that permeate all members of the companies. Learning has become continuous.
	Talent mobility
	Internal mobility is the order of the day as a career development mechanism, inviting despite the fact that opportunities are for everyone. Identify and develop people with the indicated capacities to generate value in the organization.
	Human Resources in the cloud
	Seek to make use of information technologies and data management for the best performance of the information that the Human Resources areas must manage.

Source: own elaboration, from: (Volini, y otros, 2019)

Table 10. Global trends in human capital year 2020

Attributes	Trend
Purpose	**Relevance**
	Strengthening employee connections on their teams and encouraging them to work for a common purpose.
	Wellness
	Focus on the individual at work, Designing work for the employee's well-being. Wellness programs: feel better and perform at your best.
	Post-generational workforce
	Understanding the characteristics that distinguish each employee without labeling by their age or generational classification.
Potential	**Trend**
	Super teams
	Looking for strategies to integrate artificial intelligence in teams to produce better results. Reinventing the employee's career projection to generate value.
	Knowledge management
	Creating the culture of sharing knowledge for organizational and individual reinvention generates a sense of security at work.
	Beyond reskilling
	Provide the employee with new skills to do a different job. Invest in workforce development. Invest in organizational resilience for uncertain futures.
Perspective	**Trend**
	The enigma of compensation
	The value of people in the organization must be the new approach to establish compensation strategies.
	Managing workforce strategies
	Review and put into perspective trends affecting the workforce. It is a matter of clearly understanding each trend and knowing what the degree of impact may be on the workforce.
	Ethics and the future of work
	The ethical challenges in the midst of the hectic changes that arise, especially the relationship between people and technology.
	Future of Human Resources
	Increase the scope of the human resources function beyond operational process tasks.

Source: own elaboration, from: (Volini, y otros, 2020)

Adaptability

Considering adaptability as the second key competency that every employee must develop allows it to be an essential element in the organizational culture of any organization in the current times of turbulence and disruption. They had it very clear (Denison, Haaland, & Paulo, 2003) when in their organizational culture model, one of the four pillars is precisely adaptability. (Denison, Haaland, & Paulo, 2003) define adaptability as the ability to respond to changes in the environment and new customer demands. Expanding such a simple definition they state (Denison, Haaland, & Paulo, 2003) that organizations must take risks, as well as, from the recognition of the mistakes made, an organizational learning is

Table 11. Innovation and perspectives

Autor	Descripción	perspectiva
(Seclén, 2016)	"Process through which a company improves or creates new products, processes, ways of marketing and making organizational changes, to adapt to the environment, respecting the environment, society, and above all, to generate sustainable competitive advantages in the time to ensure its survival "	business
(Blanco, Cruz, Martinez, & Parés, 2016)	"The capacity for social innovation, in short, depends on the availability of a series of resources for collective action that cannot be taken for granted. The commitment to social innovation as a strategy to satisfy collective needs, we could conclude, should be accompanied by community strengthening policies in those urban areas where such resources are scarcer due to the socioeconomic characteristics of the population. "	social
(Hernández, Alvarado, & Luna, 2015)	"Innovation becomes the tool that incorporates a creative solution, that is, a transformation that is carried out in order to overcome existing situations; it has become a systematic activity, consistent with a determined and planned purpose. "	education
(Maya, Vallejo, Ramos, & Borsic, 2019)	"Innovation is a strategy that promotes business development, which contributes to improving productivity levels; however, its effectiveness depends on the chain of different factors, depending on the capacities and characteristics of the organizations. "	organizational

Source: self-made

configured, this makes it feasible that they can generate changes. Adaptive organizations continually seek change internally.

This leads to reflect on what to do when an organization is very well integrated into its interior, it can cause some resistance when untimely movements occur and even some of a soft nature. This leads to consider that all the members of the organizations cannot be confident that they are doing well and the best thing is to have a sense of urgency, this is to always be aware of what is happening in the environment and also permanently be internally considering changes with a tone that what exists can always be done better.

Resilience

The third competition that closes this proposal is resilience. Starting by getting closer to understanding what is understood by resilience is appropriate, considering from the disciplinary scope that is addressed can provide the appropriate descriptors for the construction of the key elements of human talent management in times of disruption. For this, different authors who have conceptualized about resilience must be considered, this consolidated is found in the Table 12.

In summary, the three skills exposed, in the first instance, are the essential basis for all the people in a company to understand that by being developed they can guarantee that they will face the disruptive and turbulent times in which companies are immersed in the present and the near future. Second, organizations that understand that working on the development of skills: innovation, adaptability and resilience, is a strategy that will make a difference with its competitors. Finally, the three skills are the basis for the development of other skills that each organization should work on to mark its distinctive differential in the market.

Table 12. Concepts of resilience from the individual and the organizational

Author	Description	Ambit
(Dalziell & McManus, 2004)	"The objective of an organization is to continue operating in the face of a disruptive situation in order to achieve its purpose and defined goals."	business
(Erol, Sauser, & Mansouri, 2010)	"the ability of a company to connect systems, people, processes and information in a way that allows the company to be more connected and respond to the dynamics of its environment, stakeholders and competitors."	business
(Morgan, 2020)	"it is summed up in resisting, learning and transcending in the midst of adversity."	psychological
(Piña, 2015)	"adaptive response when a person faces adverse or risky conditions, even when it has not been specified whether it is ultimately about: a) a process or a result; b) an attribute of the person, which is there, latent, waiting to be activated by some internal and / or external force; c) if it is a concept of reactivity, that is, the way in which it responds to those external forces that are conceived as adverse and potentially harmful, disturbing, stress-generating, or d) if it is a consequence of the person's interaction with the environment in its different modalities."	psychological
(Serna, Zenozain, & Schmidt, 2018)	"An organization is resilient when it has the ability to resist uncertainty, to face crises successfully, to face changes and conflict situations; as a path to progress and not just as a survival mechanism."	business
(Medina, 2012)	"the ability of organizations to recover from an unexpected event can also be considered as a trigger for forecasting actions or as an integral part of a strategic process."	business
(Cabanyes, 2010)	"The ability to recover from extreme traumatic situations. It can be understood as the dynamic confluence of factors that promote positive adaptation despite exposure to adverse experiences. It is associated with mental health as a component of psychosocial adaptation."	psychological

Source: self made

Organizations Walking towards Sustainability

This section of the document describes three factors to be considered by any organization that wishes to undertake a responsible and determined exercise of generating a change of mentality about the work of the company in the current vertiginous times in which the world finds itself. The three factors are the Higher Purpose of the organization, the organizational culture, and the organizational structure.

Higher Purpose of Organizations

Faced with this convulsive world of sudden changes, disruptive events and trends influencing people's behavior, organizations face a major challenge: to be able to stay in the market, and even more so, to find the appropriate strategies to guarantee their business sustainability. It is about observing where the world as a whole is turning, finding that at a global level it is proposed as a utopia to achieve the one proposed as a higher global purpose: The Sustainable Development Goals. (United Nations General Assembly, 2015) has shown, as a world unit, to walk towards the 17 promulgated objectives considering as appropriate to seek to reduce, mitigate, stop and prevent the wear and tear of a planet in terms of social, environmental and the economic. How to achieve this task? The commitment and participation of the different actors of the societies in each country is considered key, referring specifically to the public institutions whose responsibility is to guide the destinies of society in each territorial district and to the private actors headed by the companies of all the economic, academic, religious, political sectors, among others.

Regarding what corresponds to private companies distributed in the different sectors mentioned above, the exercise involves guiding all their efforts in reviewing and rethinking, if they have it, their higher purpose and the responsibility that derives from it. Now, in companies that do not have this major postulate, the invitation is to make a deep reflection of their leading destiny as an agent of service and social impact. In this vein, Mr. Peter Bakker, President of the World Business Council for Sustainable Development, states directly, clearly and precisely: The SDGs provide with a new vision that allows to translate global needs and ambitions into business solutions and points out: Leading companies have been striving for a long time to ensure that sustainability occupies a central place in their corporate strategies, their decision-making processes and their governance: (World Business Council for Sustainable Development, 2017).

Anthropogenic processes, objects or materials that result not only in the deterioration of the environment, but also in the health of people and other living beings, added to the different ways of thinking of human beings with or without power, with or without money, and their corresponding behaviors and actions provoke a deepening of the great inequality and inequity that exists in the individuals who inhabit this planet. These are the aspects to be defeated and that today should be on the agenda of all companies for the reconfiguration and approach of its higher purpose as a beacon of its vision and mission within the framework of a declaration of corporate values practicable in the daily life of the company. business exercise.

Organizational Culture

Organizational culture understood as the set of values, beliefs, norms of each organization that allows it to be identified as unique in the market. Additionally, these essential elements make it possible to mark the identity through which all employees must pass and which in turn serve as the basis for the behavior of all members in relation to other stakeholders.

In organizations there must be an intentional purpose that allows to consolidate a business culture oriented to the desired challenges, this is possible to the extent that the personal values of each employee are considered and are closely related to those proposed by the organization. This generates an inventory of people who beyond their generational frame, achieving a competitive advantage at the service of organizational objectives. (Chirinos, 2009).

Organizational Structure

The third factor to consider is the type of organizational structure capable of withstanding disruptive events and their consequent changes. Therefore, considering a structure capable of adapting to the onslaught of turbulent movements in the market has to do with considering flexible structures, organizations with sufficient capacity to rebuild the way in which they have been working their activities. When talking about organizational structure, organizational design must necessarily be considered as the process that senior management uses to create the necessary positions and their respective relationships, considering the relationships of power, authority, communication, (Hellriegel, Jackson, & Slocum, 2017)

On the other hand, the different types of organizational structure, such as by departmentalization (functions), by geographic referencing (market coverage in different local, national or international areas), finally, in table 13: types of organizational structure, different types are observed that are then expressed in a classification proposed by (Robbins & Judge, 2017)

Table 13. Types of organizational structure

Structure type	Description
Simple	"Characterized by a low level of departmentalization, wide extensions of control, centralization of authority in a single person and little formalization"
Functional	"Groups employees according to the affinity of their roles, specificities or tasks"
Divisional	"Groups employees into units according to the product, service, customer or geographic area of the market"
Matrix	"Creates double lines of authority and combines functional and product departmentalization"
Virtual	"Small central organization outsourcing major functions"
Team	"Replaces the departments with prepared teams and that eliminates horizons and external barriers between customers and suppliers"
Circular	"The management positions are located in the center and spread their vision outwards, in rings grouped by function"

Source: own elaboration, from: (Robbins & Judge, 2017)

ANALYSIS AND RESULTS

Link Between Concomitant Factors and Disruptive Event

The first finding is the relationship that can be established between disruption and the concepts associated with the impacts on business activities based on the four factors collected in this research. This is possible due to the impact of factors in the daily life of the company that is affected forever. The Figure 1. Impact relationship of concomitant factors on business organizations shows the causality interaction found.

The three factors Environment, Industry 4.0 and Public Health, bring with them, immersed in their interior, the characteristics of disruption and turbulence that are affecting companies. In the case of Industry 4.0, the visible evidence of the accelerated speed with which they are being presented (robotics, artificial intelligence, automation, among others) and the way in which they impact the organization show the need to immediately rebuild your situation inside to respond in real time to market needs.

Regarding the behavior of the environment, there are organizations a little more sensitive to this factor due to its reason for being. In some cases, its impact involves understanding that organizations are consumers of raw materials directly extracted from nature, on other occasions organizations with their products or services are generators of elements that directly harm the environment.

In the third factor, public health, which until less than two years ago was considered to be affected by the excesses of some products put into circulation by companies, is now the universal protagonist that is affecting the exercise of all companies in the world. The concrete and evident case that is kept in mind, the Covid-19 pandemic. Companies, in general terms, were not prepared for an impact like the one presented in the business world up to now. In this circuit of impacts, the companies that have closed due to an unprecedented disruptive event in public health. Others have had to go out to respond to society, in the case of pharmaceutical companies, providing solutions that only history can judge if they were the most fortunate for humanity.

Figure 1. Impact relationship of concomitant factors on business organizations
Source: self-made

The fourth factor that has been planted is the interaction of the generations, the graph indicates within the company, the existence of several generations in the same organization and that today, more than ever, they must show signs of coherence, tolerance and teamwork.

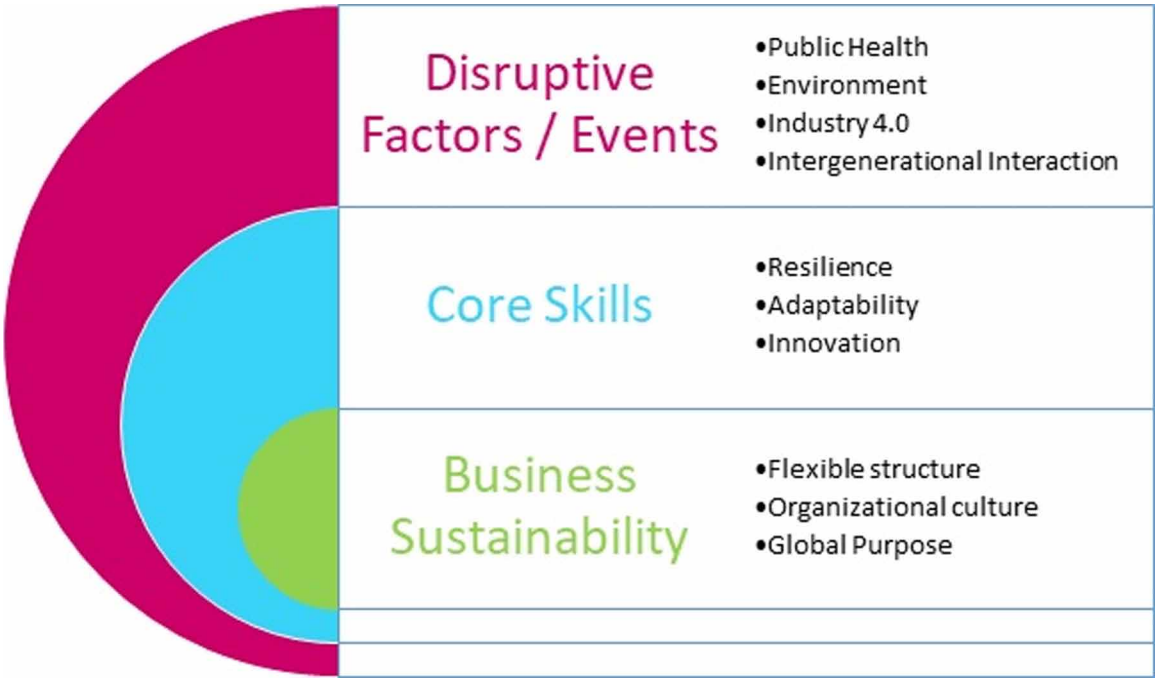
The differences in the way of conceiving the world and the way to face it extend in the workplace, without them, being good or bad, it is simply a reality that must be visualized, understood and taken actions aimed at the common achievement proposed by each particular organization. This leads to finding appropriate spaces and moments to establish open dialogue, with the sole interest of walking fair to the achievement of the proposed objectives, the ways to achieve them are those that must have the richness of difference, ideas, proposals, coincidences, differences of opinion. What is valuable will be the open-minded position that each and every generation involved must have. Depending on the case, the extent of the problem situation to be addressed, the selection of the best mix or the route with the most tendency originating from the proposals of one or another member of this melting pot will be valid. For this, it must be vital to cultivate tolerance, a transversal value to all the generations involved in the specific situation.

Whether it is an individual from the Silent generation, a Baby Boomer, an X, a millennial or a Z, the first commitment to agree on is the position of openness to listening with a clear sense to be built, the open secret must be the organizational purpose. This will be the common denominator so that all the participants of the generations can achieve their productive organizational coexistence.

Link Between Skills, Concomitant Factors and Business Sustainability.

Figure 2. Winning relationship between core competencies concomitant factors disruptive events and business sustainability, illustrates the relationship between the core competencies, their connection with concomitant factors / disruptive events and their influence on the generation of a sustainable company.

Figure 2. Winning relationship between core competencies concomitant factors disruptive events and business sustainability
Source: self-made



Now, facing the realities that are being observed, a world convulsed by a pandemic (public health) that is here to stay and that, at the time of writing this document, it is not known how long it may last, what consequences it may continue to derive, since in just one-year serious imbalances are becoming evident in the economy, education, among other sectors. On the other hand, the devastating future diagnosis of not protecting and caring for the environment or, on the contrary, the hopeful future if it continues exponentially taking the necessary actions to take care of it and revitalize it. In addition to this, the great debate on the responsible and ethical use of services and products derived from Industry 4.0 / Fourth industrial revolution and its consequences in the new social and business order. Only these three disruptive factors make re-evaluate and rethink the role of the company as a social axis that generates opportunities, then, it arises strongly how to strengthen an institution that has demonstrated, with its defects and virtues, to be an entity that can be a sieve and generator of prosperity of societies and development of the individuals that comprise them.

For this reason, empowering the people who make up organizations by working hard on the deep development of the so-called core competencies makes it possible for the concomitant factor called Intergenerational Interaction to be the key link between core competencies and business sustainability.

It is a fundamental decision, both organizational and individual, to assume the commitment to enable the necessary efforts so that each and every one of the members of the companies reach the maximum development of an entrepreneurial culture and all that this means. As well as, it is vital to have permanent spaces and moments to promote innovative ideas, actions, behaviors and thoughts. It is imperative to understand and strive to guarantee business existence by developing the ability to adapt and anticipate events to come and even a world that every day shows signs of being disruptive and turbulent.

For all the above, the fourth competence that must be permanently nurtured is Resilience, the maximum expression of the integrity of the people who, grouped in super-teams forming networks and finding in the higher purpose of each company is the necessary force to get out of the more difficult situations with winning proposals and generating value for companies.

The aforementioned, serves as a strategic platform for the construction of Sustainable Companies, which in order to guarantee its mission must work to consolidate three essential concurrent elements: the higher purpose that calls and brings together all stakeholders, from shareholders, employees, customers, suppliers and a society from which respect and admiration can be earned. The second essential element is the permanent construction of the organizational culture, which differentiates it from the others and at the same time generates a sense of belonging that guarantees the loyalty and growth space of its employees. The third structural element is the redesign or design, as the case may be, of flexible, agile organizations that are easily adaptable to the new realities of disruption and turbulence.

CONCLUSION

Business sustainability is possible as long as there are flexible and agile organizational structures. Flexible when defining super teams willing to form networks both within the organization and with other stakeholders who are willing to identify with common and agile purposes by recognizing that in times of disruption, not a minute can be lost in making the appropriate decisions that allow to react forcefully.

Resilience, as the core skill par excellence, is capable of drawing from each employee the character and tenacity to overcome and get out of the most difficult situations and moments in which they may find themselves. This skill must be worked on in organizations, becoming an institutional value in these times of disruptive and turbulent events.

Companies in the world are questioning the true leading role in society, the social enterprise movement is permeating by different organizations that, although they are clear that they must be profitable, are looking for a much higher sense, a higher purpose that is capable to be a beacon of attraction and contribution to the personal development and professional growth of those who integrate them. The SDGs are the calls to enable this new business orientation.

Leaving aside generational labels and embarking on a path of generational interaction is much more productive because it shows the interest that all people can be contributors based on their skills and experiences without distinction of age, race, gender or any other label. It must continue to turn towards an inclusive world where the important thing is the construction of a new model of sustainable development in a disruptive and turbulent world.

Human resource management must be approached differently so that it can rise to the disruptive and turbulent times in which all companies are immersed, regardless of their size, economic sector, private or public nature, all they, must consider that the concomitant factors: public health, fourth industrial revolution, environment and intergenerational interaction, require business leaders with a total disposition to understand the magnitude of the situation and the moment in which they are living. Therefore, entrepreneurs, managers and new leaders must decide to take on the management challenge demanded by these new times of disruptive change.

RECOMMENDATIONS

Business executives are in a historic, turbulent, disruptive, chaotic moment, full of uncertainty, but at the same time, full of opportunities. Assuming the crisis and facing it will be the challenge that rewards the ability to be resilient and hand in hand with the creation of inter-company networks that walk on the basis of business nobility, it is possible to rebuild what was lost and build new alternatives for purpose-oriented social enterprises. superiors included in the 2030 sustainable development agenda.

NEW INVESTIGATIONS

The present investigation leaves opportunities to continue delving into the topics addressed. Additionally, it is a starting point to carry out a consultation work between companies of different sectors and sizes on what is proposed in the field, with the aim of establishing the closeness of the relationships and impacts exposed in this research.

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Section 3

Management Strategies and Techniques for Managing Disruption

This section is made up of 10 chapters that describe different types of management strategies and techniques to face the phenomenon of disruption from different points of view and different contexts.

Chapter 15
Cultural Values as Strategic Support to Organizational Sustainability in Times of Pandemic:
Case Study of a Company in the Formal Textile Trade Sector in Colombia

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ABSTRACT

The presentation of the COVID-19 pandemic in 2020 has led all organizations worldwide to rethink their strategies and even the products and services they offered, with the aim of surviving and overcoming the economic and social difficulties that guarantee their permanence in the market. The practices framed in the Sustainable Development Goals are more current than ever, given the need to respond to the demands imposed by healthcare, while humanity's battle against the virus is taking place. This chapter details the results found in a case study investigation in a Colombian organization of the textile sector that accesses the national and international market. Its objective was to determine the values of the culture that have guided the management of the company during the COVID-19 pandemic, allowing them to achieve economic and social sustainability. It was evident that values such as solidarity promoted by the founder and integrated into the organizational culture have directed the management of the company in times of pandemic, avoiding the dismissal of its workers.

INTRODUCTION

The presentation of the COVID19 pandemic in 2020 has led all organizations worldwide to rethink their

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strategies and even the products and services they offered, with the aim of surviving and overcoming the economic and social difficulties that guarantee their permanence in the market. The practices framed in the Sustainable Development Goals are more current than ever, given the need to respond to the demands imposed by health care, while humanity's battle against the virus is taking place.

According to Córdoba, Peredo and Chaves (2020), one of the effects of the COVID-19 pandemic in the Andean region has been the prevalence of economic interests that have taken advantage of this circumstance to profit from and reorganize exploitation and capital accumulation dynamics. According to these authors, the initiatives of some organizations based on reciprocity that emerged throughout the region in response to the health crisis and in the context of national blockades have been less visible. This reciprocity was manifested through the definition of strategies aimed at helping workers, at the same time, that sustainability was maintained by seeking to overcome the public health situation.

This chapter details the results found in a case study investigation in a Colombian organization of the textile sector that accesses the national and international market. By collecting primary and secondary information, the study sought to answer the following research question: What values internalized in the organizational culture have led the changes in the management of the company during the pandemic, to maintain social and economic sustainability?

Therefore, the objective of the research was to determine the values of the culture that have guided the management of the company during the COVID19 pandemic, allowing them to achieve economic and social sustainability. It was evident that values such as solidarity promoted by the founder and integrated into the organizational culture, have directed the management of the company in times of pandemic, avoiding the dismissal of its workers through the creation of new products and the strengthening of electronic commerce. Strategic changes and adjustments to internal projects that this organization had to carry out were identified to achieve balance in the perspective of economic and social sustainability, since the COVID19 pandemic began to date.

The theoretical framework that supports the research is presented below, detailing the role of values in the organizational culture, the effect of the pandemic in the textile sector in Colombia, the methodology carried out around the development of a case study, the results found and their corresponding discussion, as well as the author's conclusions and his recommendation for future research.

THE ROLE OF VALUES IN ORGANIZATIONAL CULTURE

According to Schein (2009), values make up the component of culture that indicates what is considered important in the organization, they reflect what the company ideally wants to be and how it wants to present itself publicly. For this reason, values constitute behavioral guidelines for the members of an organization and their follow-up is required for a new member to be accepted into their work group (Ravasi and Schultz, 2006).

Shared values in the organization influence its business practices and decision-making (Rosenthal and Masarech, 2003). However, the values that are considered key do not change, although the strategy does (Rosenthal and Masarech, 2003). The founder of the organization has an important role in defining the key values and the executive level is in charge of disseminating them (Schein, 1983). Values can also be determined from the observation of failed or successful consequences of actions taken in the organization (Schein, 1983).

Rosenthal and Masarech (2003) indicated that organizations with a high performance culture are characterized by the fact that their values follow a continuous cycle within a process that makes it possible to explicitly clarify them, communicate them with tangible examples, model them, that is, turn them into collective behaviors, align them with the day-to-day operations of the organization and commit the entire organization to their compliance.

Values have been associated with organizational sustainability (Florea, Cheung & Herndon, 2013) which, according to Cohen (2010) is achieved through the development of capacities that contribute to society and guarantee permanence in the future. The application of values in acting is considered one of the principles of sustainability (Silvius, Kampinga, Paniagua and Mooi, 2017). To achieve sustainable development, organizations must, in turn, comply with the guidelines of corporate social responsibility (Ebner and Baumgartner, 2006; cited by Silvius et al., 2017).

In particular, the application of ethical values is considered a dimension of social sustainability (Carboni, Duncan, González, Milson and Young, 2018), which is understood as the responsibility assumed by an organization regarding the impact that its decisions and activities have in society and in the environment (International Organization for Standardization, 2010).

One of the values that many organizations promote and that have been considered important from an ethical point of view is respect. A respectful attitude in an individual is characterized by a treatment that allows the development of the other in a healthy environment (PMI, 2006). However, behaviors framed within the value of respect are influenced by the customs of the national culture. Cultures such as Latin, are characterized by a treatment where kindness takes great importance for the cohesion of people. In fact, Vishnubhotla, Mendes and Lundberg (2020) showed that kindness in treatment has an influence on the degree to which team members share a collective vision of the projects and feel free to participate and contribute to the achievement of the project objectives. They concluded that kindness in mutual treatment promotes cooperation and social harmony within a team.

Respect allows maintaining a work environment conducive to the development and satisfaction of the people who make up the teams, so that it is manifested in the adoption of behaviors such as attentive listening and understanding the different points of view of the stakeholders, giving public recognition to the author of an idea (PMI, 2006). The good faith with which people participate in the negotiations, which are carried out within the organization, is also a sign of respect (International Project Management Association-IPMA, 2015; Verma, 1997).

Honesty is another ethical value (PMI, 2006), which refers to the fact that people's actions are governed by the parameters of truth, that is, their behaviors and actions show a correspondence between what is said, does or think with reality (RAE, 2021). This conformity with reality, leads the members of an organization to provide reliable information, within a framework of accuracy and timeliness. Likewise, honest behavior allows people to reach agreements or establish negotiations where there are no hidden interests among the parties.

Another ethical value is responsibility. One of the behaviors associated with the responsibility is to face the consequences of the decisions, whether positive or negative. If the consequences are negative, people are urged to take actions that lessen the effect of a negative decision. In fact, authors such as De Hoogh and Den Hartog (2008) associate decision appropriation with a manifestation of social responsibility on the part of a leader and as a demonstration of an individual's awareness of the consequences that their behavior may have.

Justice is considered another ethical value. The definition of justice is commonly associated with terms such as fairness and fairness (RAE, 2021). In the first case, justice implies giving everyone what

corresponds according to their performance: For the PMI (2006), justice is applied when there are specific criteria that guide decisions and when those criteria are public and disseminated among the affected people. by them. In the second case, justice implies not making a distinction based on race, religion or any other aspect, when norms, procedures or, in general, organizational or governmental guidelines must be enforced by the organization's stakeholders. Similarly, justice implies acting without favoritism or prejudice.

Responsibility is also made tangible through behaviors associated with the fulfillment of the commitments acquired by people in teams based on their experience. Additionally, responsibility implies the care and good use of the resources assigned to the project, both tangible and intangible. Similarly, information understood as a resource requires responsible behaviors in terms of disclosure, access and availability in accordance with the levels of confidentiality defined in the organization (PMI, 2006).

In the same way, other aspects outside of ethics have been defined as values within the organizational culture. One of them is innovation. Azeem, Ahmed, Haider and Sallad (2021), related the organizational culture with the exchange of knowledge among the members of an organization and their degree of innovation. They collected information from the experience of 294 industrial managers. The results showed that knowledge exchange and innovation activities among the workforce can be reinforced when these are part of the organizational culture. Both aspects, information exchange and innovation activities were linked to high-level business processes that lead to the acquisition of advanced manufacturing capabilities.

In fact, some authors have defined specific behaviors in an organization that lead to the constitution of a culture of innovation, beyond considering innovation as a value within the culture. Kashan, Wiewiora, and Mohannak (2021) defined a series of underlying cultural dimensions and specific organizational behaviors that promote a culture of innovation. In an organizational environment, innovation is expressed through specific behaviors, such as actions aimed at learning, sharing knowledge, and the freedom to experiment in order to obtain a result. In their research, they determined twelve cultural values associated with innovation, of which it is worth highlighting risk tolerance, support for creativity, empowerment of the employees, flexibility at the executive level in the face of changes and risks, teamwork and collaboration, openness to diversity and the search for continuous development.

Like innovation, risk tolerance has been treated as a value (Kashan et al., 2021), but some authors such as Teller and Kock (2013) also defined a risk management culture. This is characterized by: (a) awareness of the existence of risks and the need for their management, (b) acceptance and commitment to risk management, (c) communication, openness towards risks, (d) trust among the organization's stakeholders and (e) exchange of information.

Also, empowerment was defined by Kashan et al. (2021) as an organizational value. Empowerment is considered a characteristic of the organizational culture (Denison et al., 2006). Empowerment as a concept has been treated mainly from two perspectives: (a) structural and (b) psychological. From the structural perspective, the focus is on the autonomy that individuals are allowed, on the responsibility delegated to them to carry out their tasks, and on their participation in decision-making. From the psychological perspective, the focus is on the will of an individual to perform their tasks (Wall, Wood & Leach, 2004).

Collaboration and teamwork are considered values by Kashan et al. (2021). In particular, collaboration has been highlighted by House, Javidan and Dorfman (2001), Denison et al., (2006) and Cameron and Quinn (2011), as an important characteristic of organizational culture. Collaboration implies a willingness of the person to offer their effort to help others (Spencer & Spencer, 1993). Collaboration is also considered a basic component of teamwork, in which all members consciously agree to offer their support to achieve the objectives set, share information and provide constant feedback.

On the other hand, in times of crisis, solidarity generally emerges, as a response to a situation that affects a group or community (Bertogg & Koos, 2021). Solidarity is defined as a circumstantial adherence to the cause or the company of others (Real Academia de la Lengua, 2021). At the organizational level, according to Myers and Johnson (2009), solidarity appears intermittently and occasionally, as a result of the degree of cohesion and trust existing between the members of an organization. Depending on the level in which solidarity is promoted by the founder or the executive level, it will become a value that directs the actions of the employees in an organization.

EFFECT OF THE PANDEMIC ON THE FORMAL TEXTILE TRADE SECTOR IN COLOMBIA

It is worth noting the fact that in 2018, the clothing product manufacturing subsector showed an increase of 1.7% at the manufacturing level, 6.9% in terms of exports and 14.5% in imports (Superintendencia de Sociedades, 2019). In 2020, the sale of textile products had a decrease of 13.8% (Sectorial, 2021). At the level of textile exports, in January 2020, these exceeded 15 billion dollars, during 2020 there was a decrease of 31.6%, while in January 2021, exports managed to be close to 13 billion dollars, showing a slight rebound (Sectorial, 2021). The production and sale of textiles has been improving since the pandemic began in 2020 due to the new market needs that require bio-safe and environmentally sustainable products (Sectorial, 2021).

With regard to textile imports, at the end of 2018, these exceeded $ 100 billion dollars, at the end of 2019 they fell to approximately $ 90 billion and in January 2020, they had an increase close to $ 110 billion dollars. The most required inputs in the country correspond to cotton and synthetic filaments (Sectorial, 2021). In 2020, China's imports were 48.8% with respect to total textile imports, followed by India (11.1%), the United States (7%) and Brazil (4.4%) according to Sectorial (2021).

Both the clothing production index and the clothing sales index with respect to 100% of the total at the national level registered an increase between 2018 and 2019 and a significant drop in 2020 (Table 1). Exports exceeded $ 40,000 million dollars in 2018, had a slight decrease in 2019 and an increase of close to $ 40,000 million at the end of 2020. Biosafety garments such as anti-fluids and face masks have been the largest demand with pandemic (Sectorial, 2021).

On the other hand, clothing imports were close to $ 70,000 million at the end of 2018, decreased to $ 60,000 million in 2019 and showed a slight increase in 2020. China is the country from which most of the imports are made. of clothing (SICEX, 2019), corresponding to 70% of the total, followed by Bangladesh (5.7%), Turkey (2.8%), Vietnam (2.8%) and Mexico (2%). The category of clothing to be at home "loungewear" is the one that is currently in greatest demand as a result of quarantines and the cancellation of face-to-face meetings.

Regarding footwear production in Colombia, there has been a decrease in recent years, starting with a negative index of -7.1% in 2018 to -31.7% in 2020. The behavior is similar at the level of footwear sales, which showed a negative index of -5.5% in 2018 to -31.7% in 2020 (Table 1). Exports of footwear decreased from approximately $ 3 billion dollars in 2018 to $ 2 billion in 2020, with Ecuador (29.5%), the United States (25.1%) and Costa Rica (8.9%) being the main three destinations for the sale of footwear abroad, among others. For their part, footwear imports have had a more stable behavior, in which the approximate volume was $ 30,000 million in 2018, of $ 39,000 million in 2019 and a decrease close to

$ 30,000 million again in 2020. On 45, 5% of imported footwear comes from China, 10.4% from Brazil and 7.9% from Vietnam, among others.

According to Sectorial (2021, cited by INEXMODA 2021), in the leather goods subsector, that is, the manufacture and sale of leather products, the production and sales indices increased between 2018 and 2019 and had a significant decrease in 2020 (Table 1). At the end of 2020, exports had a rebound to $ 5 billion of dollars compared to the $ 4,000 of 2019. 66.1% of exports were made to the United States, 7.3% to Mexico and 4.1% to Peru among other countries. For their part, imports registered a significant fall from $ 18,000 million to $ 10,000 million approximately between 2019 and 2020. It is important to note that 79.3% of leather goods imports were made from China during 2020. A 2021, an improvement is expected in both manufacturing and sales, derived from the reactivation of tourism and the recovery of nightlife social life (INEXMODA, 2021).

Table 1. Index of production and sale of clothing in Colombia with respect to 100% of total national production

Indices at the clothing manufacturing level	2018	2019	2020
Garment production index	0.1%	3,9%	2,92%
Garment sale index	1.5%	2.4%	1,85%
Footwear production index	-7,1%	-6,7%	-31,7%
Footwear sale index	-5,5%	-2,7%	-31,7%
Leather goods production index	5%	15%	-37,7%
Leather goods sale index	9,9%	7,5%	-31,6%

Source. Elaboration from Sectorial (2021).

In summary, the textile, clothing, footwear and accessories trade, since the beginning of the pandemic in March and during 2020, had monthly falls of more than 50%, achieving a small recovery towards the end of the year (Federación Nacional de Comerciantes-FENALCO, 2020a). According to the Colombian Association of Footwear, Leather and Manufacturing Industries (ACICAM, cited by Sectorial, 2021), this recovery is due to the change in consumer preference in 2020, derived from isolation and restrictions on social life, in which consumers choose to purchase informal clothing and footwear.

In line with sales, household spending on fashion for January 2021 was 2.19 trillion pesos, according to the Fashion System Observatory as of January 2021. There was a decrease of 6.4% compared to January 2020 but higher than 2019. The rise in the dollar during the same period also led producers of goods and services to seek the development of local suppliers to have a greater speed of response in supply.

Commercial establishments were affected by the continuous preventive isolations decreed by the Colombian government to face COVID-19. According to the Asociación de Centros Comerciales de Colombia (ACECOLOMBIA), in April and May 2020, attendance at shopping centers decreased to 8% in April and May 2020, increased to 17% in June, and as it was achieved greater control of contagions in the country, attendance was recovered to an average of 55% during the last months of 2020. However, on average 5000 stores had been closed nationwide at the end of 2020, so that the closure of premises was 15% (La República, 2021).

For its part, the Colombian government created the Formal Employment Support Program (PAEF) in May 2020, by which the state grants monthly and up to three times, a contribution per employee corresponding to 40% of the minimum wage. This financial aid allows legal entities, natural employers, non-profit companies, consortia and temporary unions to pay the salaries of their employees, as long as the decrease in their income is proven (Ministerio de Hacienda de Colombia, 2020). The program has allowed, as of March 2021, the protection of 3,960,411 jobs in the country (Unidad de Pensiones y Parafiscales-UGPP, n.d.).

RESEARCH METHODOLOGY

Research Design

This research has a qualitative approach, it is exploratory and descriptive in the sense that it seeks to determine how the values have directed the strategies, projects and actions of a company to face the pandemic generated by the coronavirus and ensure the social sustainability of the environment in which it develops and guarantees its own sustainability over time (Hernández, Fernández and Baptista, 2014). The study also follows a case study design, in which the unit of analysis is the organization.

Sampling and Data Collection

The information gathering was carried out through the review of primary and secondary sources. The analysis of seven interviews was carried out with high-level officials of the organization under study, published on the internet and which included the founder, the general manager of the company, the manager of the shoe factory and the logistics manager in one of the plants. Besides databases of government entities, information published in specialized magazines and sites in Colombia were consulted. The information collected corresponds to a period between August 2014 and June 2020.

The information analysis was carried out to identify the following four aspects: (a) values instilled by the founder of the organization, (b) management practices derived from the values promoted from the executive level, (c) problems faced during the pandemic and (d) strategies to cope with the pandemic.

Characteristics of the Organization Under Study

The organization under study is a family business found in the textile sector and specifically in the clothing subsector. It was founded in 1938 and has been dedicated to the design, manufacture and marketing of clothing and accessories for more than 50 years. The company began with the sale of products from existing manufacturers in the market, but the need to innovate in design and improve their prices, led it to venture into manufacturing, through an alliance with manufacturing and clothing companies in Colombia. From the beginning of the business, the tailoring service was offered, in order to respond to the specific needs of its clients.

The company has evolved with fashion during its stay in the market offering suits, jeans and formal and casual shoes for men initially, and for the last five years, for the female and children's market. Its products also include accessories such as sports caps, wallets, fragrances, suitcases, umbrellas, glasses and handles, among others.

It has 92 warehouses located in Colombia and five warehouses internationally, 4 factories and a laundry and dry cleaning plant. It employs an average of six thousand collaborators distributed in, in the administrative areas, the warehouses and the points of sale. Of the total number of employees, approximately 42% work in the commercial area.

The company's overall strategy against threats from internal and external competitors is focused on selling products of excellent quality, innovative designs, and affordable prices. Its strategy also includes the implementation of cutting-edge technologies, the launch of new brands and the development of a territorial expansion plan with international projection. Regarding the expansion of its markets, it has a corporate business unit that offers clothing and endowments for the main companies in Colombia, Costa Rica, Salvador, Guatemala and Panama. One of the services offered on some of the products, such as belts, is their customization by the customer.

In 2007, the founder handed over the general management of the company to his eldest son, who assumed this position when the company had eleven warehouses located in Bogotá. Today, the executive levels of the company are run by the founder's sons. The company produced an average of six million garments a year, before the pandemic.

RESULTS

Founder's Values

A consensus was found among the interviewees that the values that have been explicit by the founder of the organization have been those of patience, honesty, respect, a vocation for service and solidarity. These values have become business management practices, which the organization has applied during its stay in the market.

- Honesty

The meaning of honesty in this organization is to act with integrity and righteousness. Honesty is made explicit in the contracts established with employees and contractors, complying with the law and the procedures defined in the internal processes that support daily operations.

- Respect

Respect has been defined in the organization as friendly and cordial treatment between workers, contractors and clients.

- Service Vocation

The vocation of service has been defined as the attitude promoted in all employees and business partners towards identifying customer expectations and solving their needs.

- Solidarity

Solidarity has been understood in the organization as supporting its employees and people outside the organization in difficult situations. In 1981, the company created a social foundation that offers support to initiatives that promote education, health and the acquisition of own home, through its monthly contribution to 200 foundations nationwide. Donate approximately 2000 million pesos annually.

- Permanent Innovation

One of the initiatives carried out by the company was to create a plant for the manufacture of footwear in alliance with a third party, so that the need for shoes was supplied internally at the different points of sale. The organization launches an average of 200 new references a year, manufacturing from 50 pairs of shoes a day to 1500 a day. State-of-the-art technology has been adopted to improve production volumes, without sacrificing hiring, according to the testimony of those interviewed.

Business Management Practices

The guidelines with which the founder guided the management of his company and which are now followed by the executive levels of the organization, could be summarized like this:

- Maintain a zero level of indebtedness.
- Avoid incurring unnecessary expenses by promoting savings.
- Maintain a fixed profit percentage, the same for all products.
- Have a wide portfolio of products that must be renewed frequently.
- Ensure that the locations required for the operation are owned and that no rent is paid.

Problems Faced During the Pandemic

The first person infected with SARS2 in Colombia was detected on March 6, 2020, date from which the coronavirus containment phase began, which was preceded by a government preparation period that lasted an average of eight weeks (Ministerio de Salud de Colombia, 2020). A consensus was found among those interviewed that one of the main problems that the organization has faced during the pandemic stems from the uncertainty to carry out the planning of the work generated by the continuous closures decreed by the government, in response to the changes. in the number of infections and availability of intensive care units in hospitals.

Another problem faced by the organization was the payroll of approximately six thousand employees. During a period of time of approximately three months, the company did not receive any income. During this time, the executive level reacted quickly to implement actions that would allow it to have its production plants active and to make products that were being demanded to generate the cash flow required to survive.

Strategies to Face the Pandemic

As a result of the review of the information obtained, the following were determined as key strategies of the company to remain sustainable over time during the pandemic: (a) reinvest profits to pay operating expenses, (b) take advantage of the financial aid given by the government, (c) update and transform

the product portfolio, (d) improve the customer experience through electronic commerce and advice through social networks.

- Reinvestment of profits to pay operating expenses.

The company used the partners' retained earnings for vendor pay, employee payroll, administration fees, and government taxes. The administration fees of the premises were reduced to 50% by the administration of the shopping centers, which facilitated the payment. It was not necessary to go to bank loans.

- Achievement of non-operating income to support spending

This strategy was achieved through the use of financial aid provided by the government. The first program created by the Colombian government in May by decree 639 of 2020 was called the Formal Employment Support Program (PAEF), which is aimed at supporting companies with the payment of a percentage of the payroll (FENALCO, 2020b). According to the testimony of the interviewees, the company subscribed to the PAEF to obtain economic aid from the government and ensure the payment of its payroll while the economy in the country was reactivated.

- Innovation of the product portfolio according to market needs

The company had been producing an average of five hundred thousand units per month distributed in its portfolio of products aimed at offering formal and informal dresses for men, women and children. It was necessary to stop production in the month of March 2020, as soon as the quarantines dictated by the government began. Internal processes were changed very quickly to start producing and distributing anti-fluid products for medical personnel of institutional clients, including gowns, masks, caps, gaiters, among other items. The initial production was approximately 150 thousand protective suits for health personnel in May 2020, reducing the usual production of clothing to 10% compared to the production before the onset of the pandemic. Furthermore, new collections of formal but comfortable clothing were created, designed to meet the needs of people who were working at home.

- Strengthening the electronic commerce platform to improve the customer experience through electronic commerce and advice through social networks.

The sale of clothing and accessories was predominantly through direct customer contact prior to the pandemic. During the quarantines in 2020, the sales rooms were closed for more than 3 months. It was decided to contact customers through social networks, to offer them the products displayed in the rooms and deliver them in a maximum average of 3 hours. The company did not have experience in distribution, since its sale was predominantly direct and electronic commerce represented a very small percentage. Before the pandemic, they had a small warehouse of 100 meters to store the inventory of products that were offered online. With the outbreak of the pandemic, the winery was moved to the company's main building and its size was increased to 1,200 meters. For distribution logistics, the company created a network of collaborators who were in charge of delivering the products with their own transport teams.

In addition, the company developed a strategic alliance with an expert company in distribution nationwide, which would allow it to deliver its products in the minimum time expected by customers. With

the actions taken during the strict quarantines in 2020, the company achieved sales of approximately 30% of the total sales prior to the pandemic, which did not allow the survival of the company, unless economic reactivation occurred. which began in the last months of the year 2020. It is important to highlight the fact that the company's employees proposed a decrease in their income, which helped the company to keep the jobs.

DISCUSSION

The analysis of the information obtained allowed the identification of three values integrated into the organizational culture that directed the management of the company since the beginning of the pandemic in 2020, giving an answer to the research question regarding which values internalized in the organizational culture. they had directed the changes in the management of the company during the pandemic, to maintain social and economic sustainability. The following three values have been proclaimed by the founder and sustained by his executive level in the company's actions: solidarity, a vocation for service and innovation.

It was found that management practices such as the reinvestment of profits in the company, initially allowed the payment of the employees' payroll during the quarantines, in which no income was obtained from the closure of the points of sale. This decision was driven by the value of solidarity, which allowed the company to meet Sustainable Development Goal No. 8, corresponding to decent work and economic growth. Through this objective, the United Nations promotes the payment of living wages and conditions of employment in accordance with the law (United Nations, 2021).

The vocation of service was the second cultural value that particularly directed two management practices carried out to face the pandemic. The first corresponds was to offer direct advice to clients through social networks, to identify their needs first-hand and cover them. The second corresponds to the creation of a line of products related to anti-fluid clothing for the medical personnel of corporate clients. Both initiatives allowed the company to earn revenue during quarantines and point-of-sale closures, ensuring temporary economic sustainability. The third cultural value was that of permanent innovation, which allowed them to adapt very quickly to new public health conditions and to meet market expectations that changed with the pandemic.

The strengthening of the electronic commerce platform through the improvement in information technology, allowed a greater ease of access by customers. The changes in the logistics scheme were aimed at delivering the products to customers in no more than 3 hours. These changes included the creation of a network of employees who assisted in the delivery of the products, keeping them their jobs in the company. Additionally, the creation of a strategic alliance with another company specialized in logistics and distribution, ensured the coverage of market needs at a national and international level. The permanent innovation that was already part of the company's DNA has allowed the company to react and adapt quickly to changes as abrupt as those caused by the COVID19 pandemic.

One of the limitations found in this research was the lack of direct access to company officials and documents, therefore, a bias derived from the researcher's interpretation of public information could be presented. Another limitation that arose was the access provided by people from the executive level of the organization exclusively, which restricted the possibility of verifying the application of the values promulgated in the management of the employees of middle executive levels in the different areas and positions.

FUTURE RESEARCH DIRECTIONS

Future research could be aimed at making a phenomenological analysis of how the values instilled by the founder of the organization are applied by the workers in the day-to-day operation of a company. More over, future studies could be aimed at analyzing how the restrictions generated by quarantines during the pandemic influence the identification of people and their commitment to organizations and to what extent, the application of the values instilled in the company, are taken into consideration by the employees when work is done at home.

CONCLUSION

The values on which an organization is built reflect what is considered important and also what will distinguish it in the market in which it operates. The role that the founder assumes in the definition and dissemination of values is key for their internalization by the other members of an organization. The values guide the strategy and influence the type of management practices that are carried out in the day-to-day life of an organization.

Values understood as aspects that are considered important in an organization, have been defined in the context of ethics and have included behaviors within the framework of respect, responsibility, justice and honesty. But also, other aspects have been considered as organizational values and supported by academic research, such as innovation, creativity, empowerment, risk tolerance, flexibility in the face of change, collaboration, teamwork and solidarity, among others.

When disruptive situations such as a pandemic appear, these values are put to the test and will be the basis for new actions at the executive level. It is required to record the real experience of companies that have managed to maintain social and economic sustainability, based on management practices that respond to values integrated into the organizational culture.

To cover this need, a case study-type investigation was carried out in a Colombian organization of the textile sector and specifically the clothing subsector, which has managed to remain sustainable over time during the COVID19 pandemic, maintaining its payroll. The objective of the study was to determine the values of the culture that have guided the company's management practices to achieve its economic and social sustainability. The research question was answered, finding that the values of solidarity, vocation of service and permanent innovation, directed the changes in the management of the company during the pandemic. Changes in the organization included the reinvestment of profits for payroll payments, the strengthening of the electronic commerce platform, the improvement in the logistics distribution scheme and direct contact with customers using social networks.

One of the limitations found in the present investigation was the lack of direct access to company officials and documents. Another limitation that arose was the exclusive access to interviews conducted with people at the executive level of the organization, which restricted the possibility of verifying the application of the cultural values enacted by middle executive level employees in the different areas and positions.

This research extends the theory at the level of organizational management and culture. The results can guide the efforts of other organizations in different economic sectors to guarantee sustainability over time and face such unforeseen and destabilizing situations such as the appearance of the SARS2 virus, which has affected public health conditions worldwide.

It is recommended that future research include in its analysis, the practices that employees use when organizational values are applied in their daily work. This would make it possible to contrast the practices of the executive level versus the practices of the other levels in the organization and therefore, measure the degree of adoption of the values throughout the structure. Additional studies could focus on identifying changes in organizational values as a result of the pandemic.

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KEY TERMS AND DEFINITIONS

Corporate Social Responsibility: The reflection of the way in which companies take into account the repercussions that their activities have on society, and in which they affirm the principles and values by which they are governed, both in their own internal methods and processes as in their relationship with other actors (International Labour Organization-ILO, 2006).

Respect: Treatment that allows the development of people in the social environment in which they are (PMI, 2006). Tolerance to the customs and culture of the people (PMI, 2006).

Sustainability: Adoption of business strategies and activities that meet the needs of the company and stakeholders today, while protecting, sustaining and enhancing the human and natural resources that will be needed in the future (Deloitte and Touche, 1992; cited by Silvius et al., 2014).

Sustainable Development: That growth capable of satisfying the needs and demands of the present generation without compromising the possibility that future generations will also satisfy their own needs in the short and long term (World Commission on Development and Environment, 1987).

Chapter 16
Happiness:
An Approach to Labor Competence

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ABSTRACT

Happiness, job competence, and emotional competence, from an integrative perspective, are incorporated with the characteristics of the collaborator and the factors of the organization. They are emphasizing the classification of job skills and the opportunity to include emotional skills as a specific section. At the same time, it reflects on the components of happiness proposed by Seligman and the interest in relating it to job satisfaction based on the preceding scientific research. Finally, the usefulness of emotional competence is analyzed as a specific section within the general labor competencies, once happiness is considered as an emotion and therefore labor competency.

INTRODUCTION

This article on the theme of Human Talent Management incorporating the development of Happiness in issues of Labor Competence (LC) and Emotional Competence (EC). The approach to Human Talent and its Management in LC has various administrative, organizational, and psychological processes. In

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this aspect, organizational psychology and positive psychology have provided relevant foundations on Happiness, giving rise to knowledge about Positive Organizations, Happiness, and Job Satisfaction.

However, the approach to the topic of happiness is relatively new in scientific research, which reveals an incipient evidence of its relationship with the educational, labor and social fields, among others. The contributions of Heller, Judge, & Watson, 2002; Peterson, Park, Hall, & Seligman, 2009 suggest that conceptualizing happiness implies identifying the combination of mixed factors such as genetics, personal characteristics, sex, educational level, activities carried out, environment and a long etc. Human Talent management has focused on strategically directing actions that promote job satisfaction, from approaches based on motivation when meeting needs (Maslow, 1943) to those that pay attention to dissatisfaction factors and expectations (Vroom, 1964). There are some contributions to positive relationships between job satisfaction indices and organizational commitment (Mathieu, 1991; Mathieu and Zajac, 1990).

Happiness drives improvement in work centers since happy employees see changes as a source of opportunity (Andía, 2015). Working on Happiness within the organization and through organizational culture increase benefits for the employee and the company (Alayón, 2015; Celada, Gomes, & Varela, 2016; Muñoz, Plata, Ferraro, & Blandón, 2017). Likewise, brought positive relationships between job satisfaction and organizational commitment (Mathieu, 1991; Mathieu and Zajac, 1990)

Today one of the challenges is to ensure that the employees of an organization have the qualities of adaptation to change in the face of uncertain scenarios that arise. Cantú (2019) mentions that competencies change from time to time, and apparently, it is currently the time to consider Happiness and Resilience as new LC. Pardo (2019) indicates that Happiness at work begins from the moment the professional has chosen his career and has identified his purpose. Achieving that the employee's purpose finds alignment with the company's purpose would contribute to such Happiness continuing to develop.

It is intended to approximate the development of Happiness as an EC that is important to include it as a LC within an organization, that is why the objectives of this article are:

1. Raise the problem in question
2. Describe the concepts of Happiness, LC, and EC
3. Analyze the link between LC and CE
4. Propose Happiness as Emotional Work Competence (LCE) and its application in the work environment

PROBLEMATIC

Each organization has a social training specific purpose, so therefore its members manifest behaviors themselves to achieve the objectives of the organization. This causes a determined organizational dynamic, which makes it imperative to speak directly or indirectly about people and the social relationships that occur within the organizational sphere (Marco et al., 2016).

The relevance of aligning the objectives of the organization with those of the collaborator is vital for the adequate development of both. Likewise, the incorporation of a systemic approach from the micro to the macro level of the objectives, goals, expectations, and needs allows one to understand the individual as a person, in order to assimilate that the person is at a level of said system and that the group of people make up the organization at a macro level.

It is pertinent to emphasize the relationship that the employee's strengths, weaknesses, emotional and work competencies have with the organization's own factors.

The organizational factors are administrative and technical, which grant decision-making to Human Talent departments about the personnel.

To approach Happiness as a human competition will be based on the problem involves relating the individual dimension with the organizational dimension, finding moments in the process administrative, which are not linked to the whole. This leads in the first place to the clarification of the concept of happiness, since its definition has a relationship with the subjectivity of each person, historical-social moment, cultural, academic and even political conditions. Therefore, there is not a single concept of happiness, this in scientific research is related to the methodology how it is measured and analyzed. Despite the progress made regarding happiness, the instruments to evaluate it are relatively scarce (Barrera-Gutiérrez et al., 2019). The lack of research on specific data collection instruments and methodologies causes confusion regarding the operationalization of the happiness concept. In addition, there is evidence of the influence exerted by cultural factors, to the point that the instruments lose their psychometric properties when used in cultures other than that of the country of origin (Alarcón, 2006).

Subsequently, it deals with the d esconexión between labor competence and emotional competence feature of the contributor. In addition, the disconnection between the elements of Happiness, job satisfaction, and their influence on job competence will be discussed. Finally, this will be approached as an opportunity to understand the interaction and influence of employee happiness in a work environment.

In the organizational dimension, the LC necessary for each position are determined, directing the employee's talent towards the company's objectives. Currently, some organizations have opted to adopt strategies that identify and develop said talent, stimulating the motivation, satisfaction, and even Happiness of the collaborator within their work. This situation allows us to see a relationship between the organizational and individual dimensions; however, this reflection finds space to discuss this interaction at specific times when managing human talent. For example, the onboarding and staff development phases, not only with a view to the growth of the organization but also to the personal dimension of each collaborator.

The knowledge provided by the study of the organization is the Management of human talent, the P psychology, and other areas of knowledge that allow n understand terms such as job satisfaction and Happiness at work. These contributions provide tools to identify why and where there are circumstances that negatively or positively influence the generation of this Happiness within the organization's system. Previous research has found do that can also speak of Happiness in the field organizational, which is measurable through quantitative or qualitative studies (Dutschke, 2013 & Fisher, 2010).

Positive psychology allows to understand, more and with greater scientific rigor, that the individual as a person has a set of strengths that can improve the development or cultivation of a profile of Happiness. These strengths, according to Martin Seligman (1999), are observed in the construction of Positive Thoughts, Commitment, Interpersonal relationships, Meaning of life, and Achievements. Additionally, this has resulted from interdisciplinary knowledge areas as the psychology of the work and the Positive Psychology in Organizations. Nelson and Cooper define Positive Psychology as the study and application of the psychological capabilities and strengths that can be measured, developed, and effectively managed to improve performance (2007).

Despite this, little is said about the CE that the worker already possesses before entering a company, as well as their ability to be happy and their importance within the organization. This allows us to reflect on the importance of integrating the CE to the individual dimension and, on the other hand, the LC to the organizational dimension.

The current classifications of LC on them do not make clarifications or groups within these on emotional competences. They haven't completely landed a section on emotional competence, probably because some already include emotional traits. However, it is important to ask whether it is necessary to include a special CE section in the LC lists?

Another issue to raise is whether Happiness, job satisfaction, and their influence on labor competition are interlinked. Since there is more and more light on the subject of Job Satisfaction and Happiness at work, the difference between these two concepts is still not entirely clear. For this reason, when an organization is in favor of promoting job satisfaction in its collaborators, it maintains the vision of provoking positive attitudes from its collaborators towards the work they do (Kreitner and Kinicki, 1997). It should be noted that this is already significantly positive, but the collaborator's previous beliefs and capacities for Happiness are not considered.

Following Seligman's approach, the elements of Happiness are made up of Positive Thoughts, Commitment, Personal Relationships, Meaning of Life, and Achievements known as PERMA. These elements have not been fully identified in the LC classifications. It is clear that the problem is not that the partner does not possess them, but in which the organization has not previously evaluated. Evaluating them would serve as a starting point to enhance both job satisfaction and the cultivation of Happiness.

At the moment, the areas of knowledge in the humanities provide that the person performs better when in positive emotional states, and among them Happiness. But being a diverse term due to its cross-cultural nature makes it complex and, therefore, with a long way to go to study scientifically in order to be validated and used as a different term from job satisfaction. For Cantú (2019), Happiness and resilience are potential skills in these times he calls contraction, maintains that a happy worker and resilient make a difference in the company.

In order to contribute to the approach to the problem not as a negative aspect but as an area of opportunity, it is important to fill those theoretical and practical gaps where the issue of the employee's own Happiness is understood as a CE. At the same time, it can be recognized as a LC susceptible to being stimulated within the organization.

ANALYSIS

What is the Happiness?

The concept of Happiness has been approached from different perspectives, some philosophical, psychological, sociocultural, economic, and scientific. Etymologically, Happiness comes from the Latin word felicitas, which can be translated as "fertile." According to the Royal Spanish Academy, Happiness is the state of pleasant spiritual and physical satisfaction. For various scientists it has been identified as a basic emotion (Fredrickson, 2001; Retana-Franco & Sánchez-Aragón, 2008).

Ancient philosophers considered it as the ultimate end and supreme good of man that could be achieved, either by pleasure and lack of disturbance - hedonism and Epicureanism -, by reason - Socrates, Platon, and Aristotle -, or by the domain of pain and of the passions - Stoicism - (De los Rios, 2017); Gonzales et al., 2018).

Hedonists suggest that Happiness depends primarily on a life that predominantly experiences pleasant, and enjoyment of life and overall quality of life (Diener & Lucas, 1999; Veenhoven, 1984).

In contrast, the hedonistic current, formerly explained by Aristotle, can understand that Happiness would be to be completely individual or in an activity for u n own pleasure and enjoyment, during which the flying time and actions, thoughts, and movements succeed one other without pause (Csikszentmihalyi, 1990). In this sense, it is also defined as a full feeling that flourishes from within the human being, which provides the inner peace and with others (Villegas, 2015).

In addition to philosophical analysis, analysis from psychology has also left an important theoretical framework. Diener's (1984) analysis concluded an inclination for the subjective well-being concept because it is more manageable from a psychological perspective. However, other authors such as Csikszentmihalyi (1990) Lyubomirsky (2001) and Veenhoven (2015) have been more inclined towards the term happiness, which is also used in this análisis.

From psychology, Happiness has been largely studied and defined in greater depth by Positive Psychology. So, they've called also do as "subjective well-being," proposing that to some extent is observable in the behavior of individuals (Pérez-Asenjo, 2008).

Happiness is not a definition of absolute concepts because it can be a measurable quantitative and qualitative way to owning levels, indicators, and profiles (Layard, 2005; Veenhoven, 2005).

On the social approach, for Cuadra and Florenzano (2003), Happiness is a state of satisfaction that is caused by an external impact, which directly influences the emotions of the individual. In addition, it is linked to the beliefs, culture and traditions of each country. Mexico is considered one of the countries happiest in the world, because in various studies it has scored above the average which is related to the values and culture of family and love, considering less important economic income and job position (National Institute of Statistics and Geography, 2015; Figueroa, 2013; Fuentes and Reto, 2011; Olivares, 2015).

Happiness is a basic emotion, and it has been proven in the knowledge of neurobiology and neurosciences that emotions have a functional reason. Some emotions are for survival, for example, fear and stress. But others emotions, such as Happiness, which is a positive emotion, broadens the repertoire of people's ideas and actions. In turn, it allows the creation of lasting personal resources, as well as intellectual, physical, psychological, and social resources.

The field of happiness is an area of recent knowledge, although there are various theories that support its understanding from different perspectives, it is also true that there are a diversity of concepts that are often confused, used interchangeably and not also consider culture. Various investigations such as those of Diener, Sandvik, & Pavot (1991) conclude that happiness arises from a subjective measure made by each individual about the achievements in their own life.

New concepts such as authentic happiness, fluctuating subjective happiness, lasting subjective happiness, subjective well-being, psychological well-being, flourishing, personal well-being, well-being or satisfaction with life, need to be organized and differentiated.

Some of the tools used to measure happiness according to the orientation that each author gives to the concept, are for example the Subjective Happiness Scale (SFHS), Durable Subjective Happiness Scale (SA-DHS). They were carried out by Dambrun and Ricard (2011) with very good reliability and validity, which have been Adapted and validated to other places such as Mexico. PERMA Profiler questionnaire by Butler, J. and Kern, M.L. (2016). The Lyubomirsky and Lepper (1999) Subjective Happiness Scale, which from a more individual perspective analyzes what each individual considers happiness and qualifies it for their own life.

Other methodologies oriented to the work environment such as the Workplace PERMA Profiler Questionnaire by Kern, M.L. (2014). Questionnaire proposed by Del Junco et al. (2013)

In this sense, when considering different research and analysis methodologies with different variables, there is evidence that in places like Mexico the average level of happiness is higher in youth than, for example, in Bolivia, while the level of inequality of happiness is higher in Mexico (Velasco & Díaz, 2020). The same study incorporates the variant, type of locus of control, showing that people with an internal locus of control are happier than those with an external locus of control with an average of 8.14 for Bolivia and 8.00 for Mexico.

Wierzbicka (2004) establishes in his research reports on the concept of happiness between different cultures as in Polish and Anglo-American immigrant writers who encourage and encourage positive thinking, in addition to expressions such as laugh or smile in contrast to Polish immigrants who do not smile as much as in the USA.

The context that surrounds people also implies socio-cultural norms, for example, In the work of Diener et al. (1995) found some important effects that support the presence of this type of norms, among Chinese and North Americans surveyed, it was found that the Chinese think the responses less and consider it less appropriate to express both positive and negative affect. While the level of satisfaction, it tended to be slightly low compared to that of North Americans (Garrido, 2010).

Influence of Happiness Performance I Aborad

Whether that Happiness is defined as an emotion, a state, an end, a means, a complex of elements and levels likely to be measured by its objective or subjective reason because the polysemic and transcultural nature that is, the fact is that it is a concept that is getting closer and closer to including it as a variable in job performance. It will be vital to link Happiness to job satisfaction and Management of human talent.

The purpose of managing Happiness can be achieved assign to employees' roles according to their abilities, knowledge, and passions (Seligman, 2003).

The same individual as the protagonist of said Management must also decide on his Happiness. This ends up being their decision (Lozano, 2016). Therefore, for the happiness impact on job performance, the responsibility lies with the collaborated r and the organization.

Happiness is not a means for the best working people and business more profitable; rather, it is a means and a goal in itself. It is an ethical responsibility to ensure that workers in the company have n the best conditions for labor, on condition of being people capable of helping to create a better reality (Class 2012). When employees feel happy, they spare no effort for mutual benefit; however, this will depend on how they manage their own emotions and those of the environment (Prieto, 2013).

Therefore, it is important to emphasize that the area of knowledge on job happiness, job satisfaction and corporate happiness accompanies this reflection and it is important to define it. However, this analysis focuses on the happiness that the same employee generates and that can be understood as a job competence that favors better development and performance within their work.

Phillips et.al. (2017) considers that the concept of happiness differs from the concept of work happiness in a technical way, in such a way that it is not only about transpolating the concept of everyday life to work, but also considering different factors and variables to define it (Garzon Castrillon et al., 2020)

Indeed, job happiness depends both on the individual due to genetics and volitional factors, as well as on the environment, which is subject to what the company delivers to the employee (Sgroi, et.al. 2017).

What are Laboral Competition and Emotional Competition? How are They Linked?

In order to understand Laboral competition and Emotional Competition is necessary to discuss some definitions aboutLCand emotional, as well as its components according to the main theorists in this regard. In this way, you may create a relevant bridge between these two concepts and relate them to Happiness.

LC is defined as the ability to function in a working context integrating psychological attributes as attitudes and capabilities demonstrated in a job (Gordillo, 2003). It is also conceptualized as a combination, knowledge, attitudes, values, skills, and tasks that need to play in certain situations (Gonczi & Athanasou, 1996).

The National Council for Standardization and Certification of Labor Competencies (CONOCER) in 2003 has defined it as the productive capacity of an individual that is defined and measured in terms of performance in a certain work context and reflects the knowledge, abilities, skills, including attitudes necessary for the performance of effective and quality work.

On the other hand, SE is defined as the set of skills, capacities, and attitudes that are closely interrelated with the social environment (Saarni, 1997), being necessary to understand, express, and regulate emotional phenomena in an adequate way (Bisquerra, 2003). Thus, the CE must be observed in the application of a context, demonstrating self-efficacy when expressing emotions in social transactions (Ávila, 2019).

This includes the ability to promote personal improvements such as self-knowledge, self-esteem, self-control, motivation, creativity, capacity for change, and decision-making. In turn, these relative competencies must be integrated into relationships with others, such as empathy, the ability to establish adequate communication, work as a team, resolve conflicts, analyze the needs of society or markets, and be leaders in different social situations (Hué, 2008). As it should be noted, talking about CE is to put interest in the interaction between the person and the environment, learning, and development (Bisquerra and Pérez Escoda, 2007).

The North American educational proposal CASEL for its acronym in English Collaborative for Academic, Social and Emotional Learning (1994), proposes the competencies grouped in 5 categories: 1) Self-awareness, 2) Self-management, 3) Social Awareness, 4) Skills of relationship, 5) Responsible decision making.

Goleman (1995.1999) CE identifies two major groups, and n the first group of personal, distinguishes 1) self-awareness, 2) self, 3) motivation. The second group is social skills located at 4) empathy, 5) social skills.

Saarni (1997, 2000) groups them into eight, of which we will mention those that this reflection relates to Seligman's elements of Happiness. The ability to cope with the impact of negative emotions with self-control strategies. Awareness of the structure and nature of interpersonal relationships that are given by the degree of emotional immediacy or sincerity. Capacity for emotional self-efficacy: it implies accepting one's own emotional experience, living in accordance with our moral values and our personal theories.

According to Bisquerra and Pérez Escoda (2003, 2007), the CE can be grouped into five blocks framed in what is called the pentagonal model of the GROP or Research Group in Psychopedagogical Orientation): emotional awareness, emotional regulation, personal autonomy, interpersonal intelligence, skills of life and well-being.

By looking in a general way, the classifications of emotional competencies determined by these authors, authorities in the educational field, it is possible to check their compatibility with the traits and elements of Happiness.

Competency Management is a strategic tool for human resource management whose main objective is to identify the talent of each of the people working in an organization and promote it to maximize your results. As observed in the definitions of the LC, the psychological and emotional components are an important part of the capacities; hence it is pertinent to delve into the emotional elements.

In a traditional approach to the organization, the fundamental objective of job analysis is to identify the tasks and functions to be performed by employees; the organization is understood as a stable and homogeneous complex. In the new approach to competency management, the organization relies primarily on the mission, vision, values, and strategy of the organization. Furthermore, competencies are person-centered and related to the context in which they are defined.

Encourage a partner suits their abilities to change and everything that involves the planning of the organization, it can be highly demanding, and even reductionist l point reify the worker, who only contributor would be the employee to the transactional service with the company. For this reason, delving into the EC within labor establish a relationship more human.

Why Build the Concept Laboral-Emotional Competition?

Before answering the question posed, it is required to place the concept of dictionary of competencies, which is an internal document that lists those CLs relevant to the mission, vision, strategies, and culture of the organization. So it can be specified where it is intended to include the concept of Emotional Work Competence (CLE).

Martha Alles (2002) has written extensive information regarding labor competencies, classifies them into two large groups, technical or knowledge competencies, and Management. Delving into the latter, they are classified in turn as 1) Cardinal Competences (Core competences or general), and the following in the subgroup of specific competences, 2) Open management competence of Executive levels, 3) Open management competence Intermediate levels and other levels, 4) Open management competence Initial levels, 5) Knowledge competences 6) E- competences. This classification integrates the CE in each mentioned subgroup, does not elaborate a special section for them but includes some that are comparable to the PERMA elements of Happiness, for example, mettle, self-confidence, and tolerance for pressure.

CONOCER carried out a study in 2011 to strengthen the promotion and development strategy of the National System of Competences, thus achieving an occupational profile by professions in Mexico. The now National Occupational Classification System (SINCO) lists the competencies according to a basic description of the competency. It includes transversal skills, technical skills, as well as sustainability and innovation skills. It is in the section of transverse competences shown some emotional traits such as the fortress, vigor, and motivation.

The catalog How to be Competent on professional competencies according to the demands of the labor market proposed by the University of Salamanca (2013) lists 18 competencies required by organizations on a human talent that is constantly learning and adapting to changes. Some competencies are; self-awareness, achievement motivation, communication skills, responsibility, and perseverance, among others.

In none of the previous classifications and competency dictionaries is there a special section on emotional competences. Certainly, the analysis allows seeing that, if they are included, although not grouped as such. The problem of not classifying them means that they do not receive the value that they really have in them, leaving in practice the technical aspects not only as of the most important but often as the only ones to be evaluated and promoted in the workers.

Approaches to the development of Happiness as Emotional-Labor Competition

What is proposed in this reflection is first landing to the EC as a section explicitLCgenerals to be evaluated, and in second place, incorporating Happiness as a CE.

In the labor market, the importance of evaluating competencies is decisive for making decisions about the direction of its members within the organization. There are specific methodologies to make these evaluations by the human talent management departments and others to generate strategies that promote job satisfaction. But it is to discuss the need to build instruments that measure Happiness like CL. While psychology and particularly positive psychology were measured as a psychological trait of the individual, it is also appropriate to measure and observe in work environments.

The search for Happiness in the Organization is a way to favor a dignified treatment of the person and allows the organization to accompany, support, and guide its collaborators in the search for what they need to find their own Happiness. The satisfaction of needs, personal and professional development, strengthening the bond with a team where the person is accepted and valued are ways to achieve this (Alayón, 2015; Celada et al, 2016; Muñoz, Plata, Ferraro, & Blandón, 2017).

Its Applications in the Workplace

As has been analyzed, an organization presents the performance model of its collaborators through its strategic planning. It is the human talent area that manages that this set of abilities, skills, application of knowledge, and attitudes relevant to the job position of each worker are carried out. The collaborator is an agent not only of production but of change in the same organization. This implies for the organization an increasingly human understanding of the multiple dimensions of its members, such as the psychological, emotional, and spiritual, among others, which make an amalgam with the capacities of their work. Then applications to explicitly include the EC in the Dictionaries ofLCand Happiness as a CLE influence in a positive sense for the employee and the organization.

In the collaborator, you can talk about developing Happiness from its various levels. Not only from the hedonistic level but at the level transcendental and support to the other persons. Would direct other skills recognized as employment make synergy with the competition of Happiness, achieving thus a collaborator who knows well the same.

The employee could obtain resources not only materials and learning or technical expertise through their organization, but as emphasized has Pardo (2019), generating an emotional salary, as is often needed collaborator for power r talent, your passions, and your skills. It is here where there begins to be an intersection with the contributions on Job Satisfaction and the Happiness of the employee as a person.

Self-knowledge and emotional competence reinforced salary that gives the organization; this would guide the development of positive thinking, commitment, interpersonal relations, the meaning of life, and accomplishments. Entering a virtuous circle of emotional competencies that reinforce each other, giving resources not only to the collaborator but to the person that he is. For example, positive emotions and an attitude of hope are resources that facilitate facing the situations to come and the consequences of the resolution of the crisis with positive expectations of self-improvement, growth, and personal maturation (García-Alandete, 2014). Without a doubt, the fact that the collaborator possesses strengths and virtues regarding Happiness will give them the opportunity to transfer them to their work.

The benefits also could n be aimed at improving productivity according to job satisfaction. Sensitize staff to give importance to information on attitudes, ideas of value, and objectives of employees in rela-

tion to the work of the staff. Impact on the quality of life of the employee in the work area, in turn, that this positively influences the other areas of their quality of life.

In the organization, it could be an additional element to evaluate the employee, not for recruiting purposes, but for onboarding and development. It is important to clarify that this proposal is not intended to generate a criterion for hiring or excluding candidates, but rather an opportunity to get to know the new or old collaborator in greater depth and that these favors taking more pertinent strategies.

Another aspect is the impact on the work that has a company that manages Job Satisfaction, which not only CuBr and the needs and expectations specific to the worker on extrinsic factors such as infrastructure or intrinsic and psychological derived from employment as such, but enter properly in fields related to Happiness. While the attention to these factors may have a hedonistic tendency, on the other hand, allowing the development of meaning, of the common good, and of help to the other are aspects that contribute to complement the complexity of the human being. Therefore, it is a chance to get to know the member of the company better, through an on-site evaluation of their CLE of Happiness at work, also to have knowledge of this competence in other areas of the worker's life. This will undoubtedly allow the organization to be more humane, inclusive, and socially responsible.

In this sense, the same organization would find an opportunity to develop itself since the objective is not only for the collaborator in an individual sense since the sum of the efforts would characterize the entire organization, achieving a possible influence on health general organizational. Of course, this would entail the implementation of consolidation of a positive leadership not only of transformational orientation but also with the pertinent features that influence an approach that, of importance to the attitudes and feelings of the collaborators in relation to the work, the management style and at the various levels of command.

This reflection also seeks to visualize labor competence in a timeless complexity, especially those of an emotional nature, which reminds the specialists who manage human talent that, like other learning, Happiness is continuously learned, developed, and consolidated.

On the organizational culture as a set of values, principles, customs, and ways of doing things that influence the way the members of the organization act, it would allow an opportunity to align Happiness as CLE that makes their introjection more sensitive. Favoring that once the employee's happiness profile is known, the organization can evaluate whether it is necessary to provide tools to develop it.

CONCLUSION

This reflection is an essential part of education, so linking the EC with kind of interest not only in academic education. This article raised here seeks to be transferred to different types of organizations because as long as they are made up of people, it will be our own nature to have human needs as well. It will allow us to look towards a more humane work model, sensitive to the continuous search for meaning together with the generation of personal emotional resources.

Understanding that it is the responsibility of organizations and companies to leave the utilitarian perception of the worker's life at its service and change it for a philosophy aimed at the growth of the organization depends on making its own collaborators flourish.

More away from a romantic view of Happiness, it is known that the constant changes of this globalized world, the uncertainty of an economic model that is increasingly worn out in the reinforcement of consumerism, the increase in psychological, emotional, and even biological conditions put at risk the

integral stability of the people, they make each worker be seen as an ant among so many. It seems that it is forgotten that the complexity of the human endows him with levels of consciousness that lead him in metacognitive processes ready to be enhanced in all areas of his life.

Language of LC to Happiness as a CE will expand the view to better understand the collaborator. Analysis of its possible implications on the benefit to the employee and the organization can lead to a relationship of win-win. Encourage an Organizational approach to the empowerment and development of CE that are functional to the work environment and have a positive impact on the various levels of the system. Finally, consider the profile of Happiness as a CE placeable in the LC is extremely important to raise awareness among human resource training institutions, partners, organizations, and the labor market.

A limitation ng is still resistance to change because Happiness is a subjective term that depends on the individual, culture, society, and environment that surrounds them. This makes measuring complex for investigation, but evidence exists scientific about methodologies quantitative and qualitative on perceived Happiness of people. Although an approach is proposed EC more explicit about evaluating and developing the Management of human talent for Happiness, it is also important to consider other possible skills such as resilience. Therefore, it remains to raise awareness in the employee as a person, with their strengths and weaknesses, with more possible general skills for the job than those traditionally listed.

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Chapter 17
Model Management Plus for the Creation of Technology-Based Spin-Offs

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ABSTRACT

During the last years, universities have been developing the concept of creation of technology-based enterprises (TBE – spin off) as an answer to a global culture of development of science, technology, and innovation as mechanisms to structure new models of entrepreneurship in universities, being nurtured by technology and private-public alliances. With that in mind, the Plus Management Model for the Creation of Technology-Based Spin Offs Project was developed. It was aimed at developing a systemic methodology so universities, enterprises, and the government can articulate their efforts to develop spin offs of technology-based enterprises; thus, science, technology, and innovation become the core of competitiveness, the development of the society and organizations.

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INTRODUCTION

According to Spin Off Colombia RUTA N (2017), just 7 Spin Off projects have come out from 287 institutions of higher education, showing a low rate of creation of this type of enterprises. Some reasons for this situation may be related to the lack of knowledge about how to do it, lack of interest or lack of adequate resources.

The former highlights the importance of building a model that allows to establish an integration path between the academic sector and the industry to strength processes of research, innovation and development of technology-based enterprises spin offs. The proposed research methodology to develop this project is supported by the analysis and bibliographical research about a number of authors recognized by their professional and academic experience; then, variables that have an impact on the development of this type of project in universities were analyzed aimed at building a proposal of the model of management plus for the creation of technology-based enterprises Spin Off, which was finally validated by the judgement of experts.

In Colombia, functions of higher education are centered on processes of "Teaching-Research-Extension". Besides, as mentioned by Etzkowitz and Leydesdorff (2000) in the last decades a third missional activity called transference and entrepreneurship has been added, allowing universities to improve national and international pertinence, appropriateness and academic productivity indexes. According to the OCyT (2017) (*Observatorio de Ciencia y Tecnologia)*, current investment in science, technology and innovation in Colombia is particularly low compared to international indicators (especially in R&D). The report states that investment in R&D in 2015 was 0,29% of the GDP, which was lower to the average of OECD countries (2.38%), even very low compared to the Latin American average of 0.70%. The same study of OCyT (2017) states that Colombia is below Brazil, Argentina, Costa Rica, Chile, Ecuador, Mexico and Uruguay; below successful nations from Eastern Asia like South Korea and China, whose investment is higher than 2% of the GDP. The document of the OCyT (2017) also points out that this lack of management of science, technology and innovation activities has affected negatively other areas of economic development in the country such as health, environment and agriculture.

According to the Document CONPES 2582 *(Departamento Nacional de Planeación*, 2009), there are shortcomings in the capabilities to develop science, technology and innovation projects; the same document states that SMEs compose over 90% of the Colombian productive sector, and they do not have the technical knowledge, neither the financial resources necessary to invest on research projects that allow them to create new technology-based enterprises spin offs; the document also mentions factors that have an impact on the innovation and development processes of new productive units such as lack of knowledge of innovation activities, technological upgrade and lack of knowledge of incentives to innovation. Such information is ratified by the following three indicators also presented in the document, which highlights the relevance of this research project and its impact on society (such indicators are shown in tables 1, 2 and 3). Table 1: Percentage of active researchers by institution type, shows the percentage or researchers who had active projects in the period 2010-2016 in private enterprises and public and private higher education institutions (H.E.I.). Table 2: Origin of Innovation Ideas in Services Enterprises, shows the number of ideas of innovation originated in universities and services enterprises in the period 2008-2013. Table 3: Percentage of Enterprises that Invest in Activities that Promote Innovation, shows the percentage of all Colombian enterprises that invested in activities that promoted innovation in the period 2009-2015.

Table 1. Percentage of active researchers by institution type

% of active researchers by institution type							
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Public H.E.I.	43.4%	43.10%	42.73%	40.90%	40.80%	40.30%	39.80%
Private H.E.I.	31.59%	32.14%	33.85%	34.36%	34.83%	35.90%	36.38%
Private enterprises	1.05%	1.25%	1.17%	1.43%	1.40%	1.34%	1.28%

Source: The authors based in information taken from OCyT (2017).

Table 2. Origin of innovation ideas in services enterprises

Origin of Innovation Ideas in Services Enterprises			
	2008 / 2009	**2010 /2011**	**2012 /2013**
Originated in universities	381	370	283
Originated in enterprises	929	942	741

Source: The authors based in information taken from OCyT (2017).

Table 3. Percentage of enterprises that invest on activities that promote innovation

Percentage of Enterprises that Invest on Activities that Promote Innovation							
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
% of enterprises that invest in innovation	31.40%	28.50%	20.80%	18.20%	16.30%	15.40%	18.20%

Source: The authors based in information taken from OCyT (2017).

The indicator of percentage of active researchers by institution type shows that most researchers work in public higher education institutions, followed by private higher education institutions and finally, below the median, by private enterprises. This creates a problem since private enterprises do not have the competent human resource to develop research projects that allow them to create and or develop new products. The indicator that shows the origin of innovative ideas in services enterprises shows a bigger gap between universities and the private industry since most innovation ideas arise in private enterprises that develop activities tailored to know their customers' needs; on the other side, university researchers write books, journals and research articles, whose results are far from the needs of private enterprises.

As Table 3 shows, resources for the development of research and innovation processes have reduced significantly in the last years, which indicates a need to develop research projects that have an impact on society, that allow the development of new business units via the creation of technology-based enterprises Spin Offs, in which higher education institutions and private enterprises join efforts to manage their missions to create new jobs, increase productivity and improve business innovation processes. All these provides an explanation to the inability of entrepreneurs, especially those from small and medium enterprises, to identify and structure innovation projects and/or the creation of technology-based enterprises as part of the development of their strategic processes.

In order to have a deeper knowledge of that problem, it is important to cite Agudo Peregrina et al (2013), who state that entrepreneurs' creativity accounts for a big share of changes in small and medium enterprises created with state-of-the-art technology.

Universities can play a key role in the generation of impact in the society in terms of jobs, productivity and competitiveness, however, an effective coordination University-Industry-Government is necessary, so the know how becomes the generator of innovation processes to create and develop technology-based enterprises with high levels of innovation and economic development.

With this previous overview, this research project is aimed at identifying a number or success variables for The Model.

General Objective

- To build the Model of Management Plus for the Creation of Technology-Based Spin Offs in universities.

Specific Objectives

- To perform an assessment of the legal and structural state of Spin Off models in Colombia.
- To develop a state-of-the-art study about Spin Offs in both academic researches and national and international success cases.
- To build a set of variables to implement a Model of Management Plus for the Creation of Technology-Based Spin Offs.
- To perform a process of validation of the variables, which will be conducted by academicians and entrepreneurship institutions from Bogota
- To present a proposal of the Model of Management Plus for the Creation of Technology-Based Spin Offs in universities.

Nowadays, it is necessary to develop projects and research methodologies relevant to the needs of the society. Therefore, the academic community requires to develop research projects whose quality will be measured by their relevancy and usefulness of results to the society.

Academicians from universities must find alliances with public and/or private actors, with the purpose of analyzing problems and finding solutions by the use of a methodology to create technology-based enterprises Spin Off. This coordination creates benefits to universities such as: update of academic contents, development of a new and updated academic offer, and new sources of incomes.

Private business will change their view of the educational model, therefore considering universities as strategic allies to develop research projects with technological support aimed at satisfying customer needs. In addition, the Government could timely answer to a set of regulations that the Congress of Colombia has proposed since 30 years ago to boost science, technology and innovation activities as mechanism to produce knowledge, spread results and apply knowledge to private business activities.

This chapter is divided into four parts. In the first part, the needs of universities, the industry and the Government are analyzed in detail, as well as the different successful models of Spin Offs at national and international levels. The second part deals with the methodology followed, including the hypotheses, research tools, population, sample, and results obtained. The third part shows the results obtained and the fourth part presents the conclusions, showing the pertinence of the Model in terms of academic

and business development usefulness, as a strategy to improve academic and research productivity and entrepreneurial development.

THEORETICAL FRAMEWORK

To materialize the objective of this project, it is important to analyze and understand clearly the concept and types of Technology-Based enterprises. Koster (2004) states that technology-based enterprises are the result of a process of knowledge transfer by which organizations committed with design, development and production of new innovative products consolidate; such consolidation occurs by the systematic application of technical and scientific knowledge and a technological base for its development; nowadays, there are different types of technology bases enterprises, which are shown in Table 4: Types of Technology-Based Enterprises.

Table 4. Types of technology-based enterprises

Types of Technology-Based Enterprises		
Description	**Type**	**Author**
Enterprises whose founders keep a legal relation with the university, which provides products developed and/or patented in labs or research centers. The university keeps politic and/or economic rights over the entrepreneurial activities so the knowledge transfer allows for an increase of economic resources for universities.	Spin Off	Ortín, Salas, Trujillo and Vendrell (n.d.)
Enterprises whose resources to start operations come from private enterprises, also enterprises originated from private enterprises.	Start ups:	Blank y Dorf (2013), Fundación Cotec para la Innovación Tecnológica (2003) Tang, Vahora and Freeman (2004)
Enterprises whose resources to start operations come from private enterprises, also enterprises originated from private enterprises. Their objective is to consolidate technology-based enterprises to offer their products to enterprises that need the technology they provide.	Spin outs:	Tang, Vohora and Freeman (2004)
Enterprises whose resources to start operations come from private enterprises, also enterprises originated from private enterprises. Their objective is to create innovative financial products, such as online credit, online currency exchange, online payments, online banking, among other services. The mix of technology and financing creates the concept Fintech.	Fintech	Hoder, Wagner, Sguerra and Bertol (2016)

Source: The authors based on information taken from the authors mentioned in the table

Table 5 illustrates the Conceptual Framework of Technology-Based Enterprises Spin Offs presents definitions from which variables and any other necessary factors to develop The Model will be analyzed.

The previous table permits the identification of a set of important variables to understand the different processes required to create The Model. Some of those variables are: innovative enterprises, researchers, academic community, knowledge extension, young researchers, academic competitiveness, business competitiveness, economic results and productive academic units. These variables will be useful for universities to structure processes and projects to develop The Model. As a result of this conceptual analysis, the authors state the importance of setting a Spin Off classification, which originates by the way they are created, which is described next.

Table 5. Conceptual framework of technology-based enterprises spin offs

Authors	Description
Organization for Economic Cooperation and Development OECD, cited by Gómez Zuluaga and Botero Morales (2016)	Enterprises created by staff, professors, students or researchers, and that arise from research projects.
Colciencias (2017)	Entrepreneurial activity led by members of the university; it is based on the generation of new processes, goods or service resulting from structured research, development and innovation processes created in the university.
López Obando (2017)	Spin Offs become a new trend in Colombian universities regarding appropriation and spread of knowledge to the society.
Narváez, Maridueña, Chávez and Ferreiro (2016)	Universities are gaining prominence, moving from being formation-oriented towards entrepreneurship and incubators of new enterprises.
Montiel Campos, Nuño de la Parra and Solé Parellada (2012)	Name of enterprises arisen from universities, based on extensive use of scientific and technological knowledge to maintain academic and business competitiveness.
Agudo Peregrina et al (2013), Ortín, Salas, Trujillo and Vendrell (n.d.)	Enterprises whose founders keep a legal relation with the university, which provides products developed and/or patented in labs or research centers. The university keeps politic and/or economic rights over the entrepreneurial activities so the knowledge transfer allows for an increase of economic resources for universities.

Source: The authors based on information taken from the authors mentioned in the table

Classification of Spin Offs

Since Spin Offs have a different nature, the table 6 of this document presents a classification of four types, which are described in order to analyze and evaluate their incorporation into The Model.

Table 6. Classification of spin off

Classification of Spin Offs			
Type	**Name**	**Description**	**Author**
1	Independent Spin Off	The project may arise from one or more researchers, but the university does not participate as partner.	Beraza Garmendia and Rodríguez Castellanos (2012a) and Colciencias (2017)
2	Linked Spin Off	The project arises from researchers and the university formally participates in it.	Beraza Garmendia and Rodríguez Castellanos (2012a) and Colciencias (2017)
3	Joint Venture Spin Off	The project arises from researchers, the university formally participates in it and external capital for its operation is searched.	Beraza Garmendia and Rodríguez Castellanos (2012a) and Colciencias (2017)
4	Subsidiary Spin Off	The project arises from researchers, the university formally participates in it and an external enterprise for its operation is created.	Beraza Garmendia and Rodríguez Castellanos (2012a) and Colciencias (2017)

Source: The authors based on information taken from the authors mentioned in the table

This classification makes possible to establish a methodological process for the creation and link of the Spin Off to the university's academicians; this classification also establishes the methodological

and legal procedures to consider when starting to structure the Spin Off. The four types of Spin Offs mentioned are part of the set of variables evaluated to build The Model.

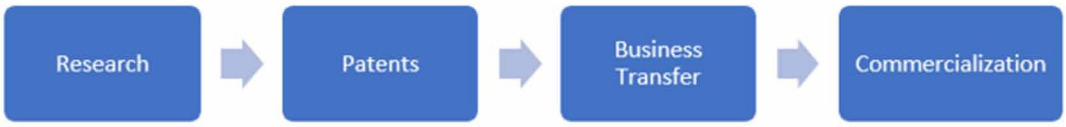
Processes to Manage Spin Offs

To build The Model, the authors conducted a theoretical review of processes to develop to consolidate a Spin Off; with the review, the authors got to know the main processes to take to build a chain value for the process of creating The Model in universities. Next, this document presents what different authors propose as a set of processes to effectively develop Spin Offs in universities.

Processes Emphasizing on Commercialization

According to this conception, a Spin Off is developed from a research project, protected by patents and transferred to a new enterprise for its commercialization; therefore, it is necessary to establish a commercialization process, with a clear target market because the research project must be aimed at developing a new good or service quickly accepted by the market.

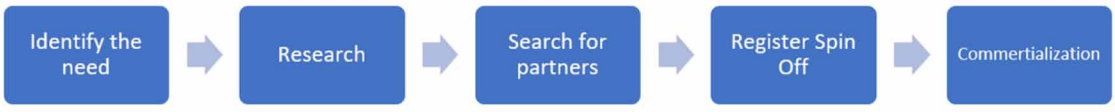
Figure 1. Processes emphasizing on commercialization
Source: The authors based on Beraza Garmendia and Rodríguez Castellanos (2011)



Processes Emphasizing on Alliances

There are five stages to create a Spin Off, called Critical Moments by the authors. First comes the identification of a need; then, researching to build a prototype; next, the search for investor partners who are able to finance the project in order to register it and commercialize it.

Figure 2. Processes emphasizing on alliances
Source: Spin Off Model proposed by Vohora, Lockett and Wright (2004)



Processes Emphasizing on Culture

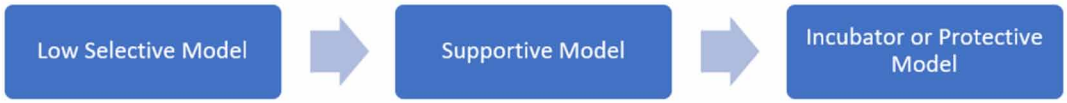
The design of The Model is not only focused on technical aspects of management; it also must develop processes to change mentality, culture, academic and administrative management, with the purpose of position these types of models for the development of an entrepreneurial culture in universities, with high levels of innovation, with the participation of the academic community, the industry and the Government.

Figure 3. Processes emphasizing on culture
Source: Spin Off Model proposed by Degroof and Baer Roberts (2004) cited by Beraza Garmendia and Rodríguez Castellanos (2011).

Processes Emphasizing on External Support

The Low Selective, Supportive, and Incubator or Protective models try to stimulate the entrepreneurial attitude, which is their main focus, before the financial potential of the initiatives. This means that sensitivity and search of opportunities are the main activity. This process' objective is the creation of as many Spin Offs as possible that may not necessarily be based on technology, but also on the development of soft and hard competencies to develop innovative projects. In the Supportive model, management of intellectual property, the elaboration of the business plan, and public and private financing are necessary to develop the project during its initial stages; the objective of this model is to create Spin Offs ambitious to grow. In the Incubator or Protective model, financing activities are of prime importance, besides those of the former; its application requires the participation of a research group recognized worldwide for its expertise in a specific technology; the unit in charge of transferring technology must be able to incubate the project, facilitate the participation of external parties, attract international risk capital and create the base of the intellectual property of the enterprise. This model considers the creation of Spin Offs as ne possible way to commercialize research results.

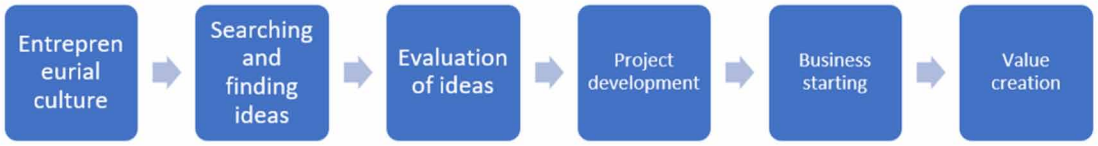
Figure 4. Processes emphasizing on external support
Source: Spin Off Model proposed by Clarysse, et al (2002), Wright M., et al (2007), Clarysse, et al (2005)



Processes Emphasizing on Creation of Value

It is important to develop an entrepreneurial culture inside universities with the purpose of strength the search and identification of the research project, to be able to manage an evaluation and selection process of the best research projects to transfer the development of research products locally or internationally.

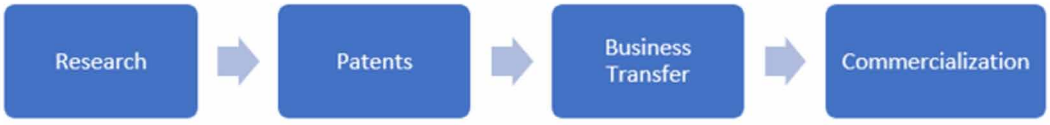
Figure 5. Processes emphasizing on creation of value
Source: Spin Off Model proposed by Pirnay (2001)



Processes Emphasizing on Leadership

Entrepreneurial culture, research management and leadership for relevant research project are strong components in university environments, all these in a framework of compensation and benefits in which researchers develop their technical capabilities in applied research, in order to transfer knowledge to the private and public sectors of the economy.

Figure 6. Processes emphasizing on leadership
Source: Spin Off Model proposed by Polt et al (2001)



The processes previously analyzed are of great importance to build The Model; they will be analyzed in order to build a systemic and objective methodological project that allows Spin Offs to reach higher effectiveness levels; thus, it is necessary to review real cases and good practices of Spin Offs that started in universities in Colombia and other parts of the world, aimed at evaluating the factors that determine the success of the processes implemented.

Successful Cases of Spin Offs

It is important to mention the main achievements of Spin Offs created in Colombian universities.

Table 7. Good spin off practices in Colombia

Successful Spin Off Cases in Colombia		
Name	**Originated in**	**Industry**
Conocimiento y servicios de Ingeniería S.A.S. (CONOSER)	Universidad de Antioquia / Fondo de Capital de Riesgo "Capital Medellín"	It focuses on efficient use of energy by the creation of technological packages focused on SMEs, tailored to the needs of customers.
Aisladores Sísmicos	Universidad EAFIT	Developed by Ecuas Consultores and EAFIT during the development of Aisladores Sismicos Spin Off. The creation of this mechanism took four years; it was built with springs and shock absorbers that work similarly to the suspension system of an automobile. Currently, this spin off has created a pilot to be implemented in electric stations and that could be used to isolate other similar structures.
Place to Train	Universidad EAFIT	It develops, manages and commercialize online programs specialized in sales, brand, customer service, negotiation, and intellectual property, among others. Each of these programs has successful methodologies, previously tested offline, to which now is possible to access online at lower costs. One of these programs is the training for sellers online, currently commercialized in Latin America.
MercaLAB	Universidad EAFIT	It offers market research solutions to determine customer profiles using biomeasuring, quantitative and qualitative research.
Quantum	Universidad EAFIT	It designs and develops virtual reality and augmented reality apps as well as interactive games applied to health and education, using the most suitable interaction type for each app.
Tecno plasma	Universidad EAFIT	It offers the design of new coating materials using plasma as well as coating services through plasma processes for all type of pieces made out of iron and other alloys, with hard and corrosion-resisting materials without altering their physical structure. Among the benefits offered are to prolong the lifetime of the pieces, higher resistance to friction, wearing and corrosion.
Bid Data	Universidad Tecnológica de Pereira	It offers mass data processing with modern techniques of AI, geo computing and statistics to facilitate decision making to enterprises. Its objective is to contribute to the development of intelligent environments to improve well-being.
Hola Dr.	Universidad CES	It is a tele-health innovative system that uses a model of medical attention from pediatric protocols endorsed by the scientific community. This helps to identify the user's needs and the correct, timely and reliably classification of the situation encountered 24/7.

Source: the authors, adapting from Cárdenas Díaz and Villegas Cuadros (2018)

Agudo Peregrina et al (2013), have written that there have been successful cases in different countries such as the United States with development of technology-based spin offs since 1980, promoted by MIT, Harvard, Oxford and Stanford, and based on applied research. Technology-based enterprises have contributed with about 33.5 trillion USD in the last years.

Table 8. Successful spin off cases in other countries

Successful Spin Off Cases in Other Countries		
Name	**Date of origin**	**Industry**
Google	September, 1998	Administration of databases constitute its business model.
Agnitio	May, 2004	Biometric voice solutions for the Government, for intelligence and forensic activities.
Daedalus	September, 1998	Business Intelligence: it develops integrated solutions to model simulate, predict, optimize, plan and operate complex systems. It has great expertise in data mining. Language technologies: it has developed a versatile language processing platform that is the base of a number of products: professional systems of spelling and grammatical review, style review, audio and video transcript, etc. Content management: it develops and integrates products and systems for the semantic processing of multilingual and multimedia content for different industries. Its products include: search (semantic, multilingual, multimedia, etc), automatic extraction of information, automatic categorization and classification of contents, analysis of opinions, feelings and reputation, etc.
Technologic Sport Company, S.L.	March, 2009	It offers ICT solutions tailored to the fitness and wellness industry. The enterprise was created to develop R&D and Innovation adding value to improve services to the industry served. IT has a line of products under the brand Airfit. Airfit is a system to generate automatically personalized and safe physical activity programs according to procedures established by the American College of Sports Medicine (ACSM). Nowadays, it is a Spin Off of the Universidad Politécnica de Madrid dedicated to develop software for sports practicing.

Source: The authors based on the cited authors

Key Factors to Create Technology-Based Enterprises Spin Offs

University-Industry-Government Triad

Digital economy, innovation and knowledge management has increased the speed of globalization, transforming organizations. Universities are affected by this reality, and different authors have performed studies that evidence that the relation University-Industry-Government is the best strategy to achieve better processes of academic productivity and promotion of knowledge applied to the productive sector.

Nowadays, applied knowledge is a foundational component of business and academic development, constituting a referent for the improvement and development of a society; therefore, coordination among universities, industries and the Government is necessary to joint efforts to reach common goals. This makes clear that universities play an important role in the economic and social development of countries by means of the transfer or knowledge to society, what is called the third mission of the university.

For this project, the process of knowledge transfer starts from the University-Industry-Government triad, for which, according from previous definitions, the Spin Off model is the most suitable; such model is gaining importance due to legislative changes that boost the articulation University-Industry-Government as mechanism to strength the academy, the creation of new jobs and projects financed by the State to develop such initiatives. The relations between universities and the industry allow the establishment of knowledge and business management networks at short and mid-terms, producing economic resources for universities, researchers and the industry. The three ways by which universities can transfer knowledge to the industry are:

- Enterprises hire research or consulting services to research groups from universities.

- Universities grant to enterprises: licenses patents, know-how or software resulting from research activities.
- Creation of enterprises to commercialize the results obtained by researching activities in universities, this is, the creation of Spin Offs.

This highlights the main role universities play in The Model; universities must have strong research capabilities focused on the development of innovative technological solutions, tailored to the market. Enterprises must become the boosting agents of such capacities, transferring concrete solutions to the market and analyzing research opportunities based on the business experience. The Government must work as a financing agent through different mechanisms, incentives and consulting; it must operate also as a regulatory agent of the process, valuing efforts, building a common ground and regulating intellectual property. This means that the triad University-Industry-Government is the base for the right management of innovation, in order to achieve development and competitiveness of countries.

The macro environment in which spin offs operate is an important factor to be considered; for example, according to research from the University of Tomas Bata at Zin, in the Czechia, the legal regulations in each country, are aspects that must be taken into account (Hunady, Orviska and Pisar, 2019). Countries must, as far as possible, eliminate those legal barriers that prevent the creation and operation of spin offs, as well as improving the quality of superior education in topics related to entrepreneurship, in order to boost the development of technology-based enterprises.

Universities Role in the Creat Spin-offs

Universities must move towards boosting entrepreneurship (Hunady, Orviska and Pisar, 2018) if they want to have leap to create spin offs; American universities with their anglo american model of higher education pioneered this model, and European universities, such as The University of Munster, which promotes an entrepreneurship certification, are also moving in that direction.

Lautenschläger, Haase, and Kratzer (2014) analyzed the staff in charge of support the development of spin offs in 54 universities, finding that there is a correlation between the higher number of disciplines in the staff the higher the number of creation of technology-based enterprises; therefore, it is inferred that the support coming from different areas of knowledge is important for the consolidation of the creation of a technology-based enterprise. Thus, universities should let departments in charge of supporting the development of spin offs to manage not only legal issues but also to support would-be entrepreneurs in areas related to commerce, human resources, technical, economic and environmental matters, in order to provide a more comprehensive orientation to this type of initiatives.

Management of Innovation

According to Beraza Garmendia and Rodríguez Castellanos (2012b), globalization and knowledge society are modifying the relation among science, technology and the economy, placing innovation as the foundational source of progress and economic wealth. Innovation has become one of the main factors to create jobs, generate investments, improve quality of life and create new products that improve organizational processes.

Robledo Velásquez (2010) and UNESCO (2010) describe objectives resulting from innovation processes, which can be considered strategic when measuring the impact of the development of Spin

Off projects. This evidences that innovation is a basic component included in the development of Spin Off projects; university projects must consider achieving innovation processes to develop new products though the incorporation of technological elements, among them: information systems, clean energies, Industry 4.0, Cloud, IoT, mobile apps, teleworking, AI and big data.

The former shows that there is not a single model that assures the effectiveness of technology-based Spin Offs; considering the former concepts and success factors, it is important to get key factors from each of the concepts worked in this project, all of them necessary to build The Model.

Key Factors to Develop the Model Management Plus for the Creation of Technology-Based Spin Offs

Key aspects are those characteristics considered important from each topic covered in the theoretical framework; such key aspects were identified as the common thread of cause-effect analysis that will develop The Model in a systemic, independent and objective way to reach the objectives.

- Normative Factors

R&D incentives, productive units, entrepreneurship, academic productivity, business productivity and knowledge management.

- Conceptual Framework

Researchers, academic community, young researchers, academic competitiveness and productive academic units.

- Classification

Independent Spin Off, Linked Spin Off, Join Venture Spin Off, Subsidiary Spin Off.

- Processes

Processes emphasizing on commercialization, processes emphasizing on alliances, processes emphasizing on culture, processes emphasizing on external support, processes emphasizing on creation of value, and processes emphasizing on leadership.

- Good practices

Business plan, technical and financial feasibility, pilot test, rights of material intellectual property, search for resources, commercialization, OTRI, technology transfer, organizational culture, culture, entrepreneurship and innovation.

- Requirements for success

Table 9. Matrix cause-effect, key aspects and proposed variables

		Spin Off Variables							
	Key Factors	**Normativity**	**Creation**	**Formulation**	**Budget**	**Partners**	**Prototype**	**Operation**	**Commercialization**
Legal Aspects	Incentives R&D				X				
	Productive units						X		
	Entrepreneurship		X						
	Academic productivity		X						
	Business productivity								X
	Intellectual property	X							
	Knowledge Management		X						
Conceptual Framework	Researchers		X						
	Academic community					X			
	Young Researchers					X			
	Academic competitiveness		X						
	Productive academic units				X				
Classification	Independent Spin off							X	
	Linked Spin Off							X	
	Joint Venture Spin Off							X	
	Subsidiary Spin Off							X	
Processes	Processes emphasizing on commercialization.								X
	Processes emphasizing on alliances					X			
	Processes emphasizing on culture		X						
	Processes emphasizing on external support					X			
	Processes emphasizing on creation of value								X
	Processes emphasizing on leadership		X						
Good Practices	Business plan			X					
	Technical and financial feasibility			X					
	Spin Off Test Pilot						X		
	Rights of material intellectual property	X							
	Search for resources					X			
	Culture, entrepreneurship and innovation		X						
	Commercialization of the project								X
	OTRI							X	
	Technology transfer							X	
	Organizational culture		X						
Successful Cases	Technology packages						X		
	Test pilot						X		
	Development, management and control of projects							X	
	Research		X						
	Design and development of apps						X		
	Resource optimization						X		
	Big data process			X					
	AI			X					
	GeoComputation			X					
	Intelligent environments			X					
	Identification of needs			X					
	Information security and traceability			X					

Source: the authors

Technology packages, test pilot, development, management and control of projects, research, design

and development of applications, resource optimization, big data processing, AI, GeoComputation, intelligent environments, identification of needs, and information security and traceability.

After the identification of key factors, a cause-effect model was built to point out the positive effect of developing these aspects on the proposed variables.

Proposed Variables to Create a Spin Off

There are eight variables proposed to create a spin off, being them: normativity, creation, formulation, budget, partners, prototype, operation and commercialization. Next, there is a description of the matrix cause-effect regarding the key aspects and proposed variables for The Model.

This matrix allows the validation of the proposed variables under a cause effect model. This is important because it helps articulating success factors of a model of integration university-industry and innovation with the variables proposed to create The Model, in a way that is pertinent to fulfill the needs of the parties involved.

METHODOLOGY

Research Type

Based on the variables considered after the theoretical review, the authors proposed a mixed research methodology. Hernandez Sampieri et al (2019) describe it as a process in which a specific phenomenon is researched (for this case, that phenomenon is The Model).

Hypotheses

This research proposes two hypotheses as follows:

- Universities know the structure of a model of management of Spin Offs aimed at improving the quality and appropriateness of academic production.
- Universities know the structure of a model of management of Spin Offs aimed at creating productive units.

Population

The population considered to participate in this project was composed by leaders of universities located in Bogota, who are in charge of graduate programs and/or innovation projects, and directors of consulting and entrepreneurship centers. The purpose of getting their input was to know the relevancy of the variables of processes proposed for the consolidation of The Model.

Sample

A representative sample of the population was selected. It included people who are in charge of graduate programs and centers of entrepreneurship from the following universities located in Bogota: Universidad

del Rosario, Universidad Ean, Universidad Santo Tomas, Universidad Jorge Tadeo Lozano, Pontificia Universidad Javeriana, Universidad Sergio Arboleda, Universidad Militar Nueva Granada and Universidad Central.

The authors considered necessary to know the perspective of leaders of consulting projects in innovation, entrepreneurship and technology transfer. Therefore, the sample included leaders from Universidad Ean, Universidad De la Sabana, Corporación Universitaria Republicana, Universidad Libre, ESAP, Compensar, Colombian ICT Ministry, KNAR and SENA.

The authors of the project reached and got the participation of 24 leaders coming from the universities and institutions selected for the research.

Data Collection

Table 10: Information tool applied shows the data collection tool used to collect data for the study. Participants were contacted and then they could answer the tool either online or in person. The objective of the tool was to find the perceptions of participants regarding the eight variables considered necessary to boost spin offs in university environments. Data collectors explained the participants about the nature of the study, variables and descriptions; besides, participants could ask and talk to data collectors in case they had any question about the tool. The participants could choose between two choices: relevant or irrelevant. By showing just two extreme choices the participants could not provide middle answers, therefore providing a more clear idea of the overall relevance of each factor.

RESULTS

Results obtained by the answers from the participants showed that the eight variables of the model, overall, were chosen as relevant by most of the participants. Table 10 shows the results obtained relate to its relevance, for each of the description of variables, per number of participants.

Figure 7 shows the average percentage of response to the relevance/irrelevance for each of the variables, considering that there are certain variables for which there is more than one description.

Results show that, overall, participants considered all variables as relevant. However, there are some differences regarding the answers. The descriptor 4, which deals with the allocation of financial resources, was the one with the highest number of participants that considered it irrelevant. Overall, the budget variable received the lowest percentage of answers regarding its relevance, even though almost eighty percent of answers considered it as relevant. On the other side, 100% of all answers regarding descriptors of commercialization considered such variable as relevant. The variables prototype, operation and normativity received over 90% of answers considering them relevant and formulation, creation and partners received between 83 and 88 per cent of answers that considered them relevant.

After the field work, the authors concluded that this type of initiative is necessary at universities to boost processes of educational innovation aligned with the needs of the industry and the Government. Besides, it is important for universities to know in detail the policies, processes and procedures necessary to implement The Model, which will help to consolidate new sources of operating income, especially in types of economic recession, during which applicants are looking for new entrepreneurship projects and sources of income. Therefore, The Model is important and useful not only for universities but for private industries that can consolidate technology-based enterprises as an answer to customers' needs.

Table 10. Information tool applied

Variable	Description	Relevant	Irrelevant
I. Normativity	The institution knows the processes related to intellectual property and the institutional documents explicitly mention the importance of a research and entrepreneurship culture via Spin Off projects.		
II. Creation	The institution as a research group, whose members hold Master or PhD degrees, that develops projects in innovation and creation of technology-based enterprises.		
III. Formulation	The institution develops activities to formulate projects of applied research, science, technology, innovation and entrepreneurship aimed at consolidating the development of Spin Offs.		
IV. Budget	The institution assigns resources to acquire what is necessary to develop innovative Spin Off research projects, and evaluates the impact of these projects at short and mid-terms.		
V. Budget	The institution has assigned a budget for marketing and sales activities of Spin Off projects.		
VI. Partners	The institution promotes the search and gets national and international resources and capital for the financing and development of Spin Offs.		
VII. Prototype	The institution and research groups analyze the progress of science, technology and innovation in Colombia and the world, and it designs prototypes of new productive units via Spin Offs for the industry and the Government for their development.		
VIII. Operation	The institution disseminates to the industry and the Government the results of science, technology and innovation in order to find partners to develop Spin Offs.		
IX. Operation	Professors, researchers and students visit enterprises to identify new research projects aimed at developing new Spin Offs.		
X. Operation	The institution signs agreements with the Government and national and international industries for academic cooperation and technological transfer, and then, it evaluates the impact of Spin Off son productivity /ROI		
XI. Commercialization	The institution considers the development of Spin Offs, in which members of the academic community commercialize the projects, but the university has no influence on the economic results of the projects.		
XII. Commercialization	The institution considers the development of Spin Offs, in which members of the academic community commercialize the projects and the university has an influence on the economic results of the projects.		
XIII. Commercialization	The institution considers the development of Spin Offs, in which members of the academic community commercialize the projects, but it is necessary to search for external capital for the operation of the projects.		
XIV. Commercialization	The institution considers the development of Spin Offs, in which members of the academic community commercialize the project, but the participation of an external enterprise for the development of the projects is required.		

Source: the authors.

Construction of the Model Management Plus for the Creation of Technology-Based Spin Offs

Based on the results obtained, The Model, consisting of 8 variables, was built. For the construction of The Model, the authors considered the concept of value chain proposed by Benítez Codas (2012) who

Table 11. Number of respondents to relevance/irrelevance per descriptor

Variable	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Relevant	22	20	21	16	21	20	23	22	23	22	24	24	24	24
Irrelevant	2	4	3	8	3	4	1	2	1	2	0	0	0	0

Source: the authors

Figure 7. Average percentage of answers per variable
Source: the authors

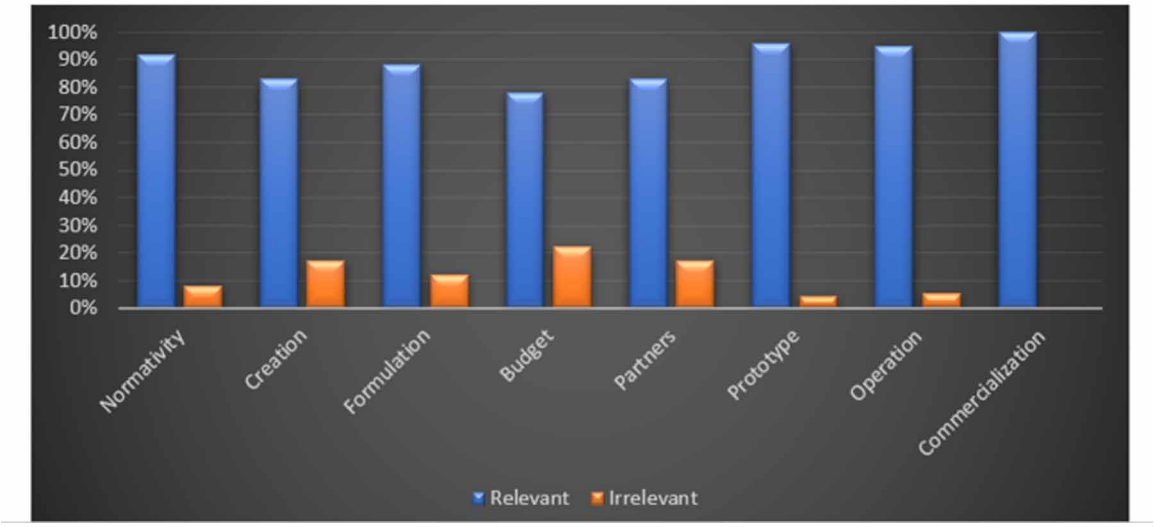
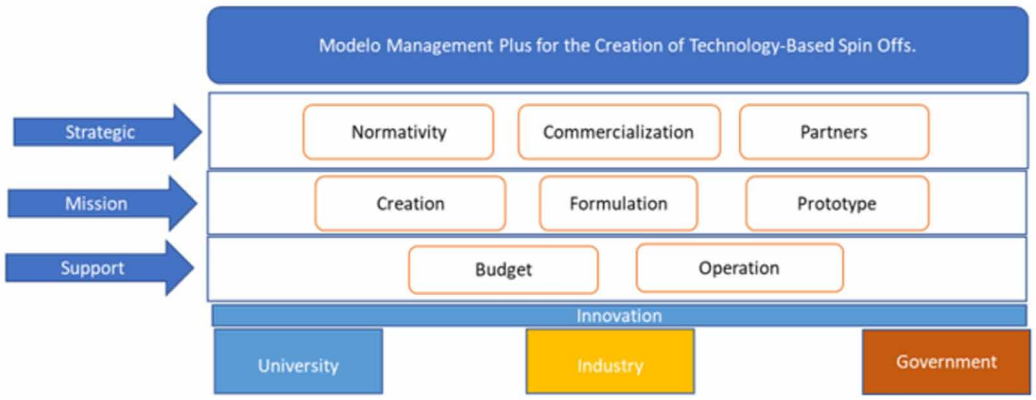


Figure 8. Model of management plus for the creation of technology-based spin offs
Source: the authors based on the mentioned authors



states that value chain provides a competitive advantage by the development and integration of the activities of the organizations. Therefore, the authors created the graphical description of The Model, shown in Figure 8.

The Model shows a logic sequence for the development of technology-based Spin Offs in universities. The basis that supports the project is the triad University-Industry-Government. Processes directed to different Spin Off types are at the strategic level: [1] the normativity helps defining legal guidelines for the constitution of Spin Offs as well as the management of intellectual and commercial property rights; [2] commercial processes support the search for potential clients interested to buy the products (this process must consider the break-even point and the fulfilment of sales objectives); [3] the process of partners is aimed at finding partners for the development of Spin Offs, considering the planning and structure of the projects (it is important to create agreements with the partners in order to guarantee resources for promotion and sales activities).

Creation, Formulation and Prototype processes are at the mission level. The creation process is important to understand the dynamics of Spin Offs in the country and the university itself; thus, it is necessary that researchers and other members of the academic community know and get used to the concept of Spin Off and are able to materialize projects working with students. The creation provides technical tools to analyze sales and institutional tools for the implementation of the project. The formulation process is useful to analyze from academic, technical and financial perspectives the feasibility and impact of the project in the community. The prototype process is aimed at developing a number of Spin Off prototypes to evaluate their functioning, durability and any other characteristic of the goods or services in order to guarantee their quality and fulfillment of customers' needs.

Budget and operation processes are support processes. Both processes must be coordinated to develop the project from financial and production perspectives to guarantee an adequate service and the fulfillment of the budget to achieve financial goals stated at the beginning of the project.

CONCLUSION

Nowadays, Spin Offs originated in universities are the main source of knowledge and income for universities; they become a tool by which universities transfer to the industry, the Government and the society, the technical, technological and scientific knowledge resulting from research projects. Success factors and proposed variables allow the understanding of the nature of processes of Spin Offs creation, that impact society as referents of digital transformation.

In addition, it is important to mention that the research staff of private industries do not have enough capabilities to develop and finance innovation processes to create technology-based enterprises. Furthermore, normative and regulations that apply to Spin Offs in Colombia are unknown in universities, that is why the Government, through Colciencias (a government institution) must develop a program to train people involved in the Colombian system of science and technology, in order to strength competencies for the development and application to calls for projects of creation of technology-based Spin Offs.

The analysis of the academic environment, good practices and successful cases evidenced the need to improve the main functions of research processes. Therefore, it is necessary to improve the technical capabilities of research teams, with a training focused on service to society to create research projects with high value added and technology-based products.

Regulation in Colombia lets universities to develop technology-based Spin Offs to improve indicators of academic and working productivity. On the other side, according to data from the OCyT, entrepreneurs do not know the research capabilities that can arise from the joint efforts of universities and the Government. Reaching universities and entrepreneurship centers located in Bogota enabled the conclusion of this analysis to know the relevance of the proposed variables to include in The Model. Such variables had rates of over 90% of acceptance for the successful development of the model proposed.

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Chapter 18
Problem Solving and Risk Management Methodology:
Feedback From Experiences With the Use of Taxonomies

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ABSTRACT

Intending to lead organizations to continuous improvement, this chapter proposes a methodology that involves three axes: risk management, problem- solving, and feedback experience. This methodology allows organizations to characterize the experiences they have already confronted, as well as new experiences (which can be risks or problems) with the use of taxonomies established by the organization. It also enables them to capitalize and exploit their knowledge base. This work proposes a best-use approach of the past experiences that are similar to a current event and facilitate their treatment and provide solutions. The authors take the feedback as a point of articulation between the two methodologies because it is a mechanism that offers knowledge where it can be found that the organizations must avoid and take advantage of.

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INTRODUCTION

The introduction of new technologies and incursion into new markets presents organizations with relevant challenges and risks that endanger their effectiveness and efficiency. Given this, methodologies aimed at dealing with problems and their risks, to prevent them and hopefully eliminate them, become that much more important. In this sense, it is useful to have scientific rigor methods that help to define actions geared towards valid and reliable results.

The close relationship between a "problem" and a "risk" can be explained as follows: A "problem" is an unwanted event in the present that may negatively impact the course of action, while a "risk" points to a possible problem in the immediate future. In this sense, Figure 1 describes risk management before developing the problem and risk management after the fact. It shows that detected risks can more easily be prevented in the future.

To address these events, two methods are commonly used by organizations: the Failure modes and effects analysis (FMEA), and the 8 Disciplines (8'D). The FMEA is characterized by being a simple yet effective procedure for the analysis of potential failures. This process uses a knowledge base to encode and classify the external and internal agents that can cause disruptions and then identifies their probability of occurrence. It also ranks inherent risks in order of importance to find out the priority of the risk and to eliminate or mitigate its impact. After the global review, treatment actions are designed (Qin, Xi & Pedrycz, 2020).

When the problem has already occurred, the 8'D methodology is adopted using a series of eight steps to solve the problem. This methodology allows experts to contextualize the occurrence and provide a temporal solution response to avoid further damage. Afterward, a cause analysis is performed that helps to propose solutions for the problem; then they are implemented and validated. This methodology focuses on identifying the origin of the adverse event based on a root cause analysis (Štofová & Szaryszová, 2017). To maximize poetentialize the two methods, this article proposes a methodological approach as a "feedback" process that capitalizes on an organization's experiences as a knowledge management system based on its members´ expertise. The managed knowledge is composed of the events resolved in the past, also known as training cases. For the reuse of these cases the four stages of Case- Based Reasoning are followed (Schott, Lederer, Eigner. & Bodendorf, 2020). These stages enable organizations to solve a current problem under the reuse of the experience of similar past issues.

Background

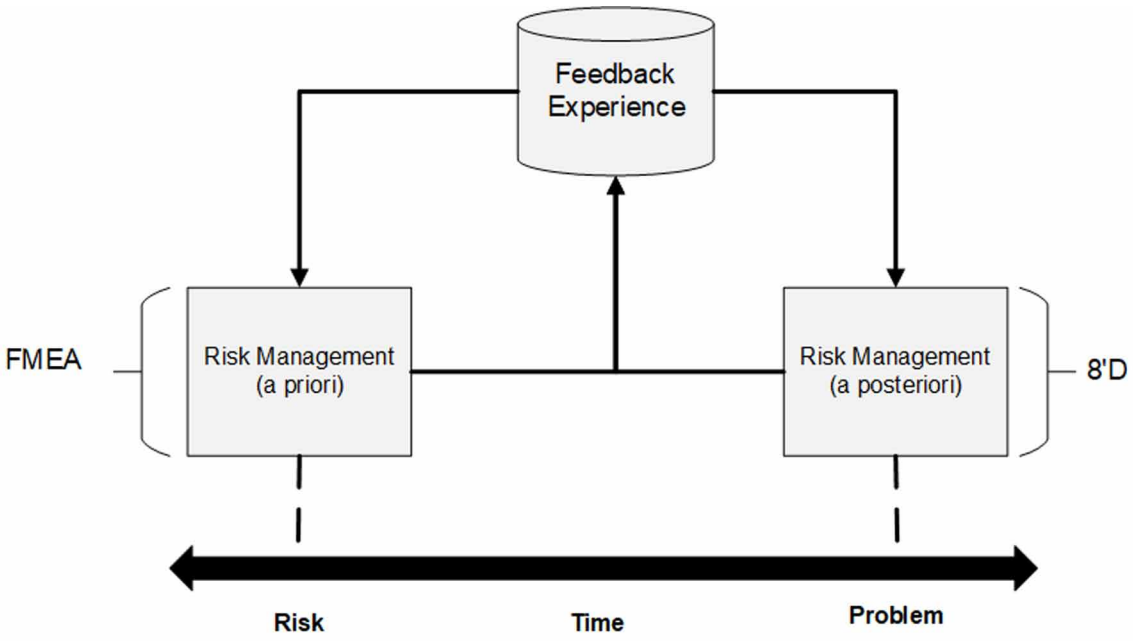
Before citing the articles related to this manuscript, the risk and problem in this research are explained. A risk is an event in the present that will become a problem in the future; a problem is an event in the future who was at risk in the past. In other words, a problem and a risk are the same events in times of different spaces.

In a priori risk management, the Failure Mode Effect Analysis (FMEA), is for most of the world's companies, the most effective and accepted problem-solving tool, introduced in 1949 (Ng, Teh, Low and Teoh, 2017). There are four types of FMEA: system, design, process, and service. The first one is the highest-level system analysis, which is made up of various subsystems. The second one focuses on the design of the product. The third emphasizes the manufacturing or assembly process that focuses on the quality of the products manufactured. And, the fourth is responsible for analyzing the service before it reaches the customers. However, researchers as Qin et al. (2020) propose to compensate the weak-

nesses of the FMEA method and enhance its capacity to evaluate and classify the failures according risk factors modes.

Also, in the industrial field, there are different problem-solving processes such as 8D, PDCA (Plan Do Check Act), DMAICS (Define Measure Analyze Improve Control Standardize), and 9S process (9 Steps) Jabrouni, Kamsu-foguem, & Geneste (2011a). Fig. 1 illustrates an overview of key concepts. The In this document, the authors assume that risk management a priori (FMEA), and a posteriori (8'D), can be supported by feedback experience.

Figure 1. The relation between risk management and problem- solving
Source: the authors

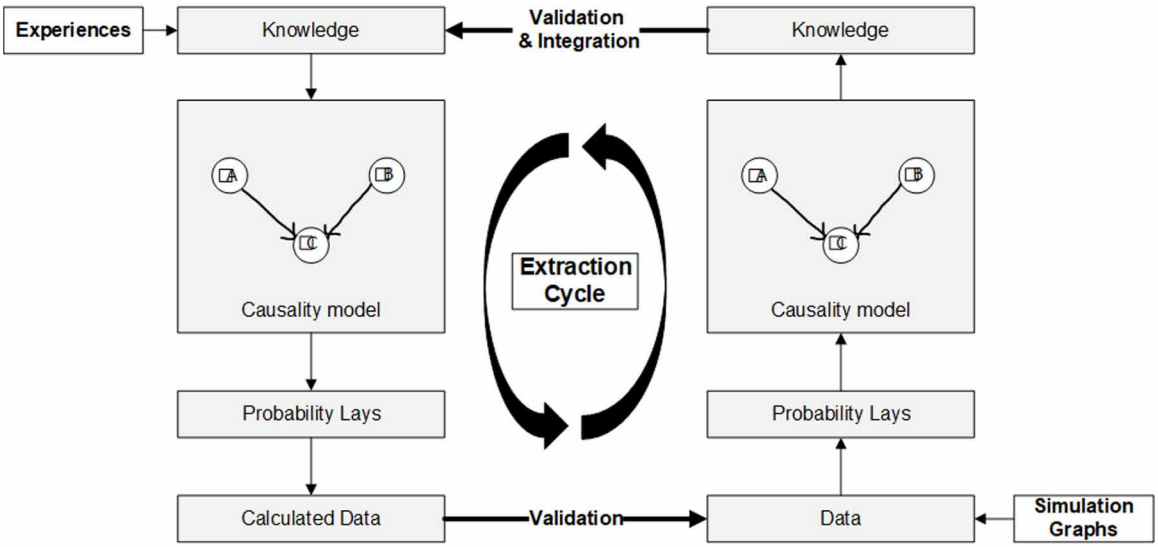


The literature reports studies that integrate some of the following tools into problem- solving and/ or risk management. Manota Geneste s- Niño, Clermont, Geneste & Halabi (2015) present a methodology that integrates the feedback process and risk management. Also, Villeneuve, Béler, Pérès, Geneste & Reubrez (2016) developed a support mechanism for decision making, joining statistical and cognitive experience for risk assessment. Besides, Villeneuve et al. (2016) provided a methodology that combines the knowledge of experts and statisticians to improve risk management and the relationship between feedback and problem- solving can also be seen in Jabrouni, Kamsu-Foguem, Geneste & Vaysse (2011b).

On the other hand, Pitiot, Coudert, Geneste, & Baron (2007) propose a hybrid methodology that uses meta-heuristic algorithms for the search and knowledge-based model that provides heuristic concepts adapted to different cases. This evolutionary algorithm reuses the knowledge of the "return of experiences" (Figure 2). This knowledge is generated and updated in the decision process that starts with evaluating of the scenarios generated by the evolutionary algorithm and previous analysis of the projects. This process allows the selection of those scenarios in a multi-objective context. The proposal of Pitiot et al.

(2007) is to use previous experiences to accelerate the processes of finding solutions while limiting the excessive effort of combinatorial computing.

Figure 2. Extraction cycle of experience feedback
Source: Pitiot et al. (2007)



MAIN FOCUS OF THE CHAPTER

The authors observed an area of opportunity: "hybridization of risk management and problem-solving using a system of capitalization and exploitation of experience." So, this work provides an approach to analyzing the causes of an organizational problem supported by feedback or risk management. However, the process of risk management and problem- solving is disjointed. This article presents contributes to the field of problem solving a risk management approach as a methodology that reuses the experiences of other problems/ risks taking into account the characteristics of the current situation or new case, which makes it an approach that could serve as an articulation in the problem analysis based on the "feedback", while strengthening the FMEA and 8D methodology´s usefulness.

To demonstrate the usefulness of this methodology for problem solving and risk analysis based on the organization's experiences, a Case Study is used. This study addresses a "priori" (events that have not yet happened) and a "posteriori" (events that have already happened) articulated through a "feedback" process.

Methodology

The methodology proposed is based on "risk management" and "problem- solving" methods. The knowledge engine coded in the "feedback" process is based on taxonomic classification. This classification is then based on a semantic similarity of events, in which problems or risks can be recognized from their more specific characteristics (Jabrouni, Kamsu-foguem, Geneste, & Vaysse, 2013).

The "Methodology for problem- solving and risk analysis based on experiences" is an alternative for the mandatory compliance with one of the criteria of ISO 9001:2015 that refers to "the identification of negative or positive disruptive events". These events can occur or have occurred; in other words, they can be seen as risks or problems depending on the time and moment in which they are studied.

This article proposes a hybrid of methods based on risk management, problem- solving and feedback of experiences that allows for a faster response time to a disruptive event in organizations. With the support of taxonomies and semantic similarity, the relationship is evaluated between the current event and past events to determine (based on experience) the actions to be implemented and the actions to be discarded. Under this approach, the hypothesis is that the process of dealing with the event will be expedited and will provide a prompt response. This union of methods and tools has been selected because of their similarity in their implementation phases, while their complements potentialize their effects.

Experience Model

The purpose of this model is to take advantage of company's positive and negative experiences for problem resolution or risk management. The experiential model consists of transmitting the specific knowledge or experience taken applicable to operational, tactical or strategic levels so that, although the experience is reused, it positively impacts the organization´s results.

The experiential model takes advantage of past to minimize error repetition and increase an activity, process, or business performance. This model divides into: the capitalization of information; the processing; and the information exploitation. Capitalization refers to locating, collecting and storing the relative information of an experience. The treatment/ processing, includes the creation of new knowledge or the updating of previous ones based on the generalization of the incidents recorded. Finally, the exploitation refers to making available and promoting the use of experiences and knowledge to support the decision-making of the current process.

Semantic Notation of Experiments with the Notion of Taxonomy

Semantic similarity has gained importance in different areas such as artificial intelligence, biomedicine, and natural language. According to Hernández- García, Tovar- Vidal, & Lavalle- Martínez (2018) and Hernández- García, Tovar- Vidal, Lavalle- Martínez, & Cervantes- Márquez (2018) semantic similarity is a measure of how similar a pair of concepts are (for example event A and event B). The similarity between A and B is related to aspects they share in common. The more elements they share in common, the more similar they are. Therefore, semantic measurement is done by knowing the different or similar characteristics between events.

Although similarity measures exist in the literature, the "Wu & Palmer" measure mentioned by Jabrouni et al. (2013) is used in this article's methodology. By way of explanation, the similarity between problems and/or risks can be estimated in the following manner (based on Figure 3):

- The distance (the extremeness of similarity or dissimilarity) separates the linguistic labels (the common names) from the problems or risks addressed that are being compared in the taxonomy. This is with respect to the first linguistic label in the taxonomy with those in common.
- The distance between the first common label and the root label of the taxonomy.

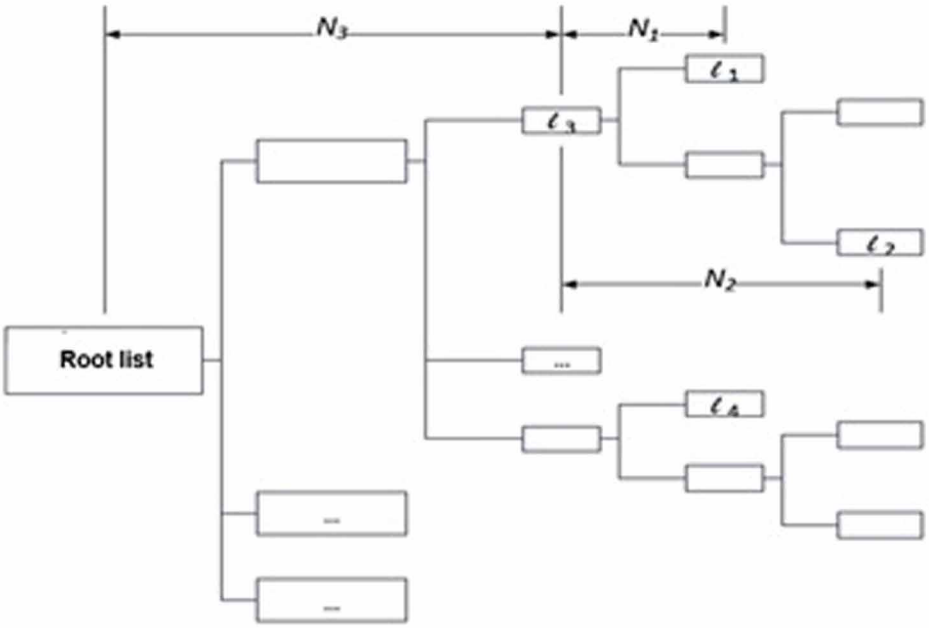
From Jabrouni et al. (2013) Equation 1 helps to determine the similarity of "Wu & Palmer" between two concepts (events) "l1" and "l2".

Equation 1

$$Sim(l_1, l_2) = \frac{2\,x\,N3}{N1 + N2 + 2\,x\,N3}$$

N3 corresponds to the number of arcs between the root tag and the first common concept (l3) (Manotas- Niño, 2017). In this case, the measure of semantic similarity allows us to compare the company´s experiences and those that are being focused on for future benefit.

Figure 3. Semantic similarity in a taxonomy of concepts
Source: Manotas- Niño (2017)

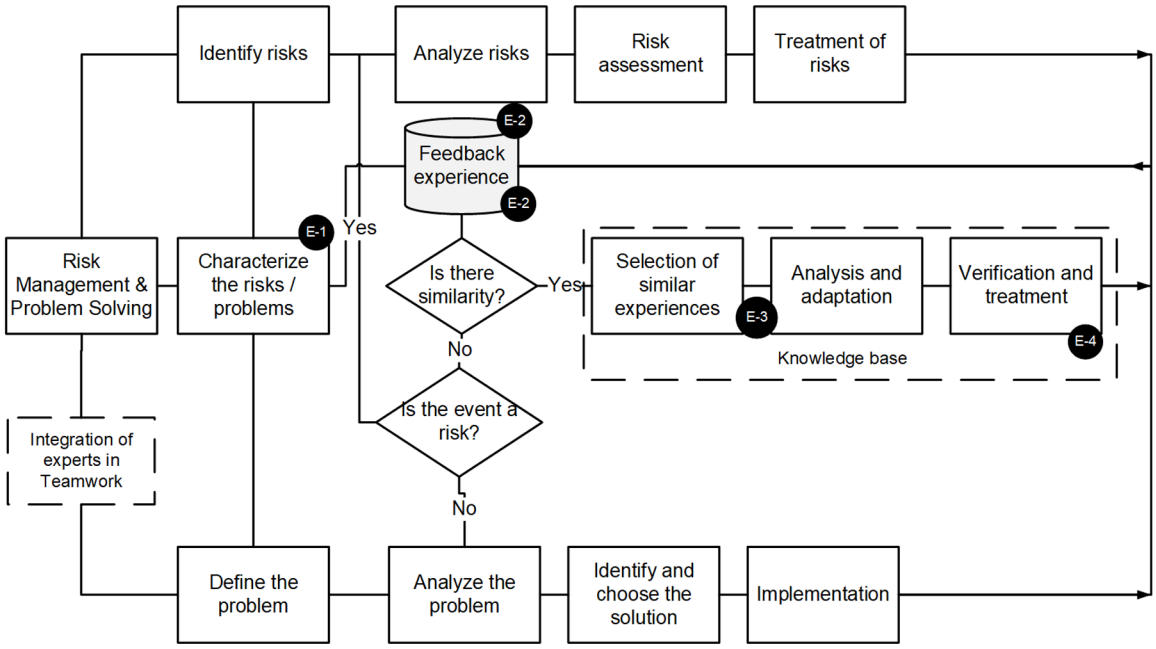


It is essential to mention that each organization must choose or create a taxonomy appropriate to its activities, eventually adapting from existing taxonomies.

Reuse of Experiences

The researchers propose through Figure 4, each of the stages of risk management, problem- solving, the knowledge base, and the steps assigned when an event similar to the event under study exists or not.

Figure 4. Stages of the methodology for problem- solving and risk analysis: an experience-based approach
Source: the authors



Stage 1 [E-1]. Characterization of the Current Risk/Problem

After establishing the context and defining the work team, the problem/risk is identified with one of the tools (such as root cause analysis, 5WH1, Delphi, or others). For the characterization of the problem, Jabrouni et al. (2013) and Jabrouni et al. (2011a) propose an "is-a" type hierarchical relationship between the concepts, this is, the use of taxonomies. Thus, the company needs to have its taxonomy defined to label the experiences with three factors in mind: product, department and type of problem/risk, of which two are proposed by (Jabrouni et al., 2011b).

Stage 2 [E-2]. Exploration of the Experience Base. Calculation of the Similarity Measure

This stage aims to search the knowledge base for similar experiences that may help resolve the current situation. Jabrouni et al. (2013) consider the search of past events to use similarity measures that identify the past events most similar to the current one. This step serves as a comparison between the current event and past events, creating a case library. This in turn, enables the organization to find the elements, causes, solutions, effectiveness of the actions implemented of the previous events likely to

have an interest in the current problem/risk. To measure semantic similarity, Wu & Palmer in Jabrouni et al. (2013) are used. With this measure, the degree of similarity between the two events (current and past) are effectively manifested.

Since there are three factors to be evaluated, it is advisable to weigh them in order of importance to the company. The organization should also set the similarity acceptance value, that is, the minimum value of similarity that must exist between two events for them to be accepted as similar. The similarity values obtained would then be classified by decreasing order to identify the most similar ones.

If the similarity accepted by the organization does not exist, it is considered as a new experience that must be solved with the corresponding methodology (problems with 8Ds and risks with FMEA).

If it is a "problem" with "8Ds", and if it is a "risk" with "MEFA". On the contrary, if there is a similarity, the experiences should be taken into account to continue with the next stage.

Stage 3 [E-3]. Analysis of Past Experiences and Their Adaptation to the Current Case. Reuse of Experiences

The feedback form of each of the similar experiences should be analyzed, studying the causes that provoked the problem/risk and the solutions and performance of these actions. In this stage´s development of, it is a matter of adapting those solutions to the new context. To do this, various techniques used in the Case- Based Reasoning (CBR) systems and similar techniques should be used.

This methodology considers structural adaptation since, although the past event has a high value of similarity with the current one, these are not identical. Therefore, the experts´ actions consider appropriate to be taken and other actions are added to the knowledge base. The actions to be implemented are based on the decision-maker´s current experience and the historical expertise of the decision-making group.

Stage 4 [E-4]. Treatment and Learning. Evolution of the Current Case and its Recording in the Feedback Database

In this Stage 4, the team must evaluate the solutions implemented. The following questions are proposed to the team members: Do you already have a solution that works? why has it worked? and to what degree? There are two treatment perspectives for risks: treat them as threats (avoid them, transfer them, mitigate them and accept them), treat them as opportunities (benefit from them, share them, improve them and take them).

During the implementation of actions, it is essential to follow up and measure their effectiveness. If the result is unsatisfactory, then it should be corrected. But if the product is in line with expectations, it is considered a learning resource and should be retained based on feedback. Individuals progressively learn as they save the evolution and performance of the actions reused in the future. According to Jabrouni et al. (2011b), the experience can be represented by the context (the description of the problem/risk before it has been analyzed), the analysis (including all the possible causes that originated the problem/risk), and the solution (the set of actions that bought about the solution to the problem/risk). An experience (Ei) can then be represented as related in Equation 2:

Equation 2

$$E_i = C_i, A_i, S_i$$

Where:

C_i, refers to the context (the description of the problem before analysis)
A_i, refers to the analysis (the search for the root cause of the problem)
S_i, it refers to the solution (the set of actions that solve the problem)
Therefore, Eq. 3 describes a joint base of experience
(B_{EXP}):

Equation 3

$$B_{EXP} = \left\{ E_i, i \in \left\{ 1, ..n \right\} \right\}$$

Where:

E_i, refers to the experience it contains $C_{i,}$ A_i and S_i
i, its *iesima* experience

The set of experiences can be understood as immediate actions taken to solve a problem or minimize the risk. Once a state of control is reached, it is advisable to identify its root cause and define the action or set of actions that improve the overall system.

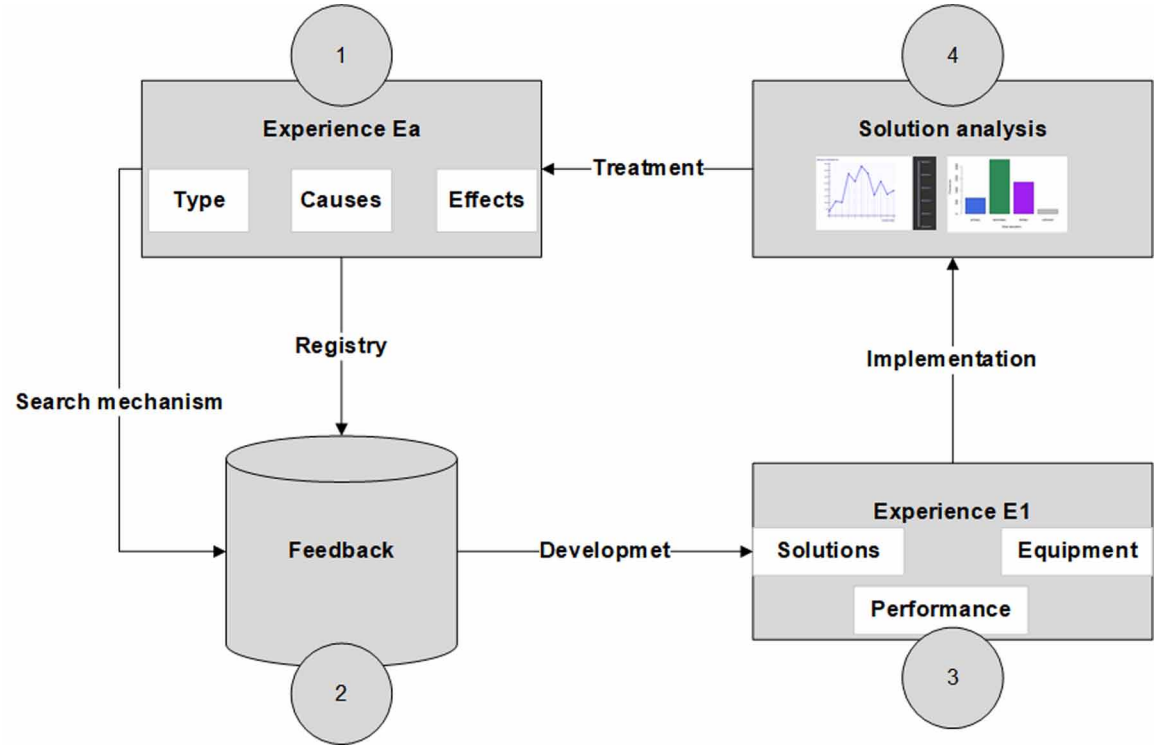
SOLUTIONS AND RECOMMENDATIONS

The results are presented in a Case Study that was inspired by the ABC Company that manufactures household appliances and electronics such as Smartphones, Televisions, Dishwashers, Vacuum cleaners, Printers, among other white line items. Three frequent problems were identified in this company. These include two experiences that are registered in the feedback database and one current event (not registered in the database). The company's taxonomy was also constructed in relation to past experiences of events and occurrences harmful to the overall organizational process. Figure 5 summarizes the four Stages (1, 2, 3, 4) and their sequence applied to this Case Study.

Stage 1. Characterization of the Current Problem/Risk

First, the process begins with the general description of the current problem, described as "Company ABC is facing a problem of declining sales". To further elaborate, after a period of launching a new product, the product experienced exponential growth in the market. Then dramatically, within thirty days, it experienced a decrease in sales.

Figure 5. Methodology for reusing experiences
Source: the authors



To study this problem, the 5 W's (based on Table 1) there were used and showed that the current problem (P1) was occurring in the commercial department with the sale of the product "TV UHD 4 K". This item was in the growth stage, but then a downward trend of 50% was observed dramatically. The main people involved in this event were customers, suppliers and the head of the department. Once the problem was described, a taxonomy of risks and problems of the company was designed with three factors (product, department and type) to characterize the taxonomy´s current event, as shown in Figure 6.

Table 1. Description of the current problem

Question	Current problem (P1)
Who?	Those involved: Customers, suppliers and the head of the sales department.
What?	Decrease in sales of the TV UHD 4K product.
Where?	Commercial Department.
When?	The problem appeared after a month.
How?	The trend in the sale of the product is downward.
How much?	50%
Why?	Because the product is in the growth stage.

Source: the authors

Figure 6. Characterization of problem 1
Source: the authors

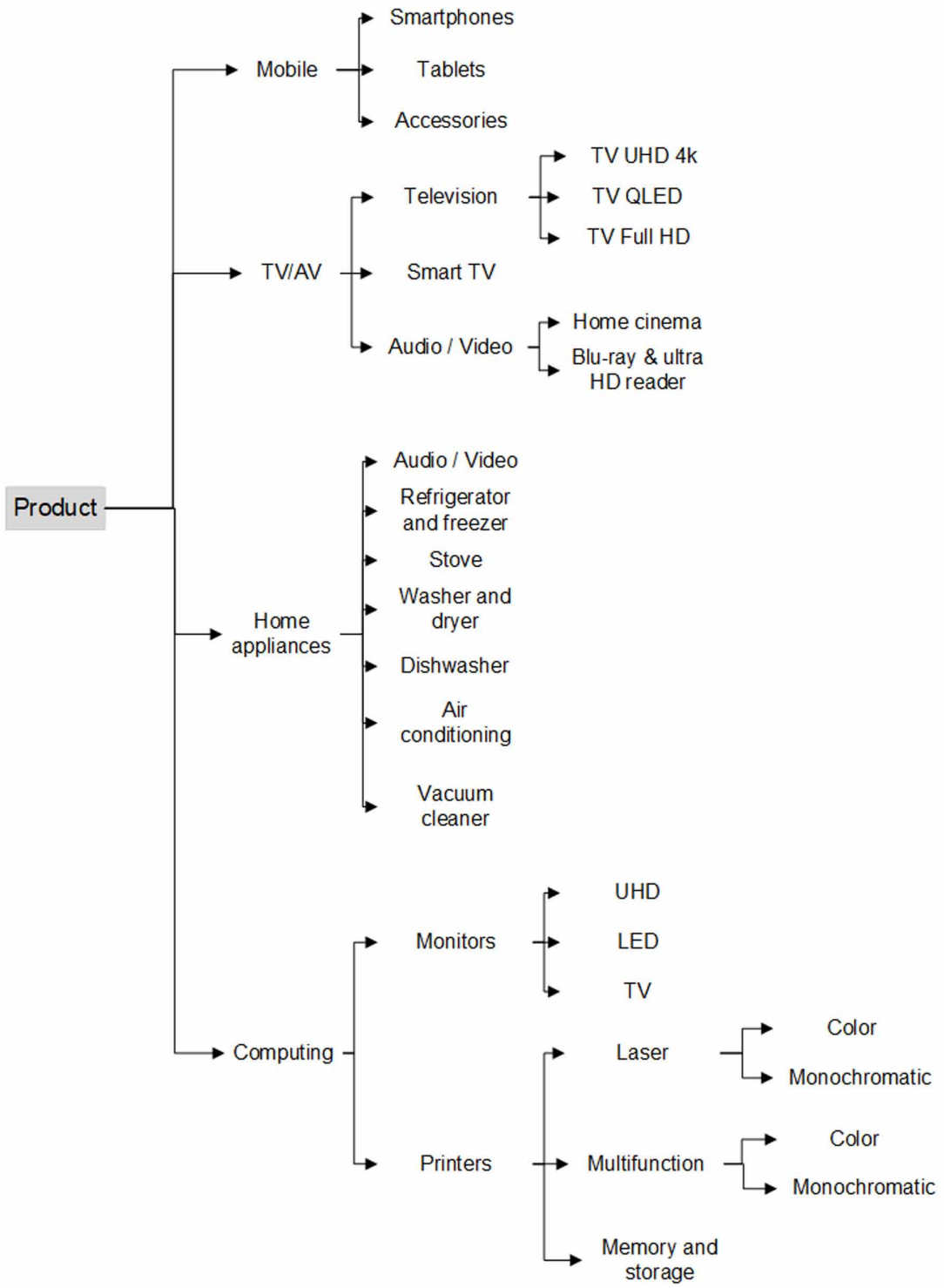


Table 2. Description of recorded problems

Problem P1: after a period of launching a new product, it experienced exponential growth, then within thirty days, it experienced a decrease in sales.	Product affected	TV/AV- Television- TV UHD 4K.
	Department	Commercial- sales.
	Type of problem	Organizational- suppliers- material flow.
Problem P2: Liquid refrigerant for the manufacture of climates had caused undesirable effects on operators who are in contact with it for more than 3 hours.	Product affected	Home appliances- air conditioning.
	Department	Manufacturing- production.
	Type of problem	Security- people.
Problem P3: the cost of glass for the manufacture of LED monitor desktops has increased over the past two months.	Product affected	Computing- monitors- LED.
	Department	Commercial- shopping.
	Type of problem	Organizational- suppliers- irregular fluctuations.

Source: the authors

Stage 2. Exploration of the Experience Base

The Knowledge Base encodes past experiences for comparison with the current event. In this Case Study, two past problems were used (P2 and P3) described in Table 2. The Wu & Palmer similarity measure was applied to the current problem (P1) concerning the historical cases and data reported in Table 3.

Of the above calculations, P1-P2 were 34.6% similar, while P1-P3 were 77.5% similar. According to the ABC Company´s acceptance criteria, one event is considered similar to the other when both present a similarity of 8%. Therefore, only the P3 case is considered as a similar experience.

Stage 3. Reuse of Experiences

In Stage 2 was identified that the experience to be reused was the P3. In Stage 3, its historical report is now analyzed. This report contains the information regarding its causes, the mitigation actions practiced, as well as the work team that attended the event, and the information that could be extracted by the experts (for reuse). In this Case Study, it was concluded that the current problem P1, relating to the decrease in sales of the product TV UHD 4K, was initially correlated with the sales price of the TV UHD 4K. This in turn was correlated with the increase in the cost of production derived from the increase in the purchase of materials and components for the TV UHD 4K manufacture. The increase in the purchase price of the materials was presented as a consequence of suppliers´ change, which was a decision taken historically because the previous supplier provided materials and components with specification problems. Consequently, it was decided to change to a supplier with a higher purchase price and quality materials and components.

When analyzing the P3 sheet, two solutions can be seen that help the P1 case (Action 3 and Action 4). However, the experts decide to add two creative solutions to the historical problem (Action 1 and Action 2). Therefore, there are a total of four actions to be carried out (Figure 7).

Table 3. The measure of similarity applied to past problems

PI-P2	Similarity	Weight	Total
	Sim (L1, L2) = $\frac{2XN3}{N1+N2+2xN3}$		
Product affected	Sim (P1, P2) = $\frac{2X1}{3+2+2} = 0.28$	10%	2.8
Department	Sim (P1, P2) = $\frac{2X1}{2+2+2} = 0.5$	30%	15
Type of problem	Sim (P1, P2) = $\frac{2X1}{3+2+2} = 0.28$	60%	16.8
Total			34.6
PI-P3	Similarity	Weight	Total
	Sim (L1, L2) = $\frac{2XN3}{N1+N2+2xN3}$		
Product affected	Sim (P1, P3) = $\frac{2X1}{3+3+2} = 0.25$	10%	2.5
Department	Sim (P1, P3) = $\frac{2X3}{0+0+6} = 1$	30%	30
Type of problem	Sim (P1, P3) = $\frac{2X3}{1+1+6} = 0.75$	60%	45
Total			77.5

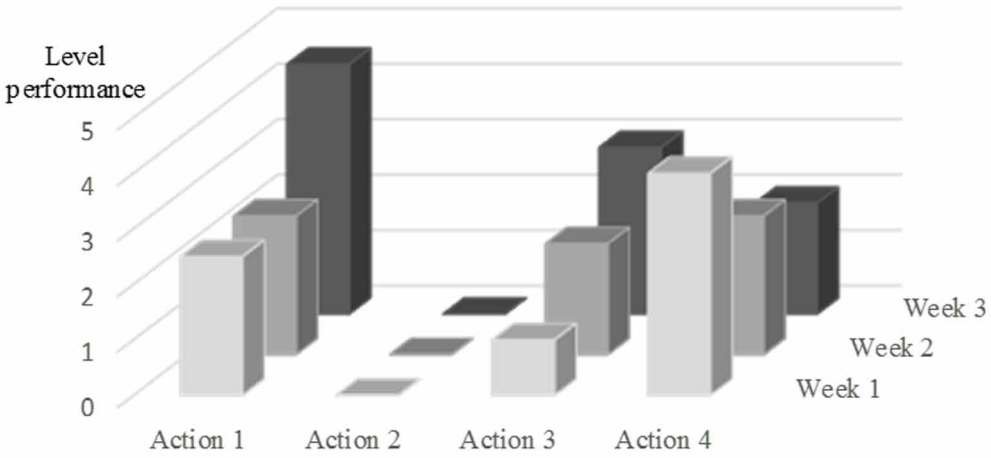
Source: the authors

Figure 7. Actions to be implemented to solve the P1 problem
Source: the authors

Stage 4. Treatment and Learning

Once the four actions were implemented, they were followed up for three weeks to observe their performance using a company indicator´s values. The results are recorded to know which actions worked, which did not and why, and general observations on the system´s performance. Finally, a report is generated and the P1 is recorded in the Feedback Base as a new experience to be reused in the future. In the performance of these actions (Figure 8), it can be seen that Action 1 (Selection of suppliers under specific criteria) shows results with an increasing performance during the three weeks of the study.

Figure 8 Evaluation of the four actions implemented in P1
Source: the authors



The experience card that is stored in the Knowledge Base encodes the following information:

- Four supplier selection criteria are defined, in which price is not considered in the decision process.
- The costs of implementing the actions are high, so the simulation is recommended for future decisions.
- It is appropriate to evaluate the integration of Action 1 with a manufacturing process redesign action.

These results showed a new perspective to take advantage of past experiences as a way to support knowledge transfer to decisions makers in complex and similar situations, problems which are present in today´s human experiences.

FUTURE RESEARCH DIRECTIONS

In its next version, this "Methodology for Problem Solving and Risk Analysis" incorporates a measure of resilience that quantifies the organization's ability to recover from disruptive events. In systematizing the methodology, the adaptation to the ProWhy Software (http://www.prowhy.org/) is sought.

CONCLUSION

Various methods have been proposed that take advantage of the experiences of historical events as a guide for problem- solving and/or risk management, which functions as a form of feedback from the Case Study. In this article, a structured method has been presented to address the solution of a problem and/or risk management, to which a knowledge matrix is articulated as a feedback process that records experiences that are expected to be similar to the current situation under study. To contrast past experience with the present (the current situation understudy), a similarity measure prioritizes past events that are more similar to the current one.

The development of this method provides the decision-maker with the clarity for treating an event as a problem or as a risk, based on a taxonomy that characterizes the problem/risk it addresses; as well as a measure of semantic similarity that helps to find the experiences that are most similar in the past and in the present. At this point, the use of this methodology may become impractical if the knowledge base that records historical events´ experiences is scarce. In this sense, it is useful to feed it with experiences from companies that the decision-maker considers appropriate to their organization´s context.

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KEY TERMS AND DEFINITIONS

Capitalization of Information: Refers to locating, collecting, and storing the relative information of an experience.

Exploitation of Information: Making available and promoting the use of experiences and knowledge to support the decision-making of the current process.

Problem: It is an event in the future who was at risk in the past.

Risk: A risk is an event in the present that will become a problem in the future.

Semantic Measurement: Is done by knowing the different or similar characteristics between events.

Semantic Similarity: Is a measure of how similar a pair of concepts are (for example event A and event B). The similarity between A and B is related to aspects they share in common.

Taxonomic Classification: This classification is based on a semantic similarity of events, in which problems or risks can be recognized from their more specific characteristics.

Treatment of Information: Includes the creation of new knowledge or the updating of previous ones based on the generalization of the incidents recorded.

Chapter 19
The Paradoxes Between Business Performance and Organizational Behavior in Colombian and Ecuadorian Companies

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ABSTRACT

Increases in business performance are essential for an organization's success in both the public and private sectors. Using the Hofstede organizational culture model, the chapter has centered emphasis on factors that affect primarily financial results. In this study, the authors look at the importance of organizational culture traits as a predictor of financial performance in Colombian and Ecuadorian companies. They discovered that despite Colombia and Ecuador having similar histories and cultures that can be similar to a high level, in volatile and rapidly evolving settings, strategic approaches that concentrate on both distinction and low costs at the same time are often in conflict with Porter's classic approach.

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INTRODUCTION

Ecuador and Colombia, despite being neighboring countries maintained different macroeconomic realities in the last 4 years, from 2017 to 2020. Regarding real GDP growth, Ecuador with 17.76 millions of people has maintained an average rate of -0, 95, an average inflation rate of 0.05, as an effect of a dollarized and in recession economy that has been worsened by the effect of COVID 2019, in addition to an average unemployment estimate of 4.5 (International Monetary Fund, 2021b). While Colombia, with 51.39 millions of people has maintained an average real GDP growth of 0.12, an average inflation rate of 3.37 with various devaluations of its currency, in addition to high levels of average unemployment estimate of 11.4 that rose by the last year due to the pandemic´s effect. (International Monetary Fund, 2021a).

Organizational performance is a multidimensional concept of great importance in strategic management which interests both academics and managers that can incorporate several dimensions which are not highly correlated between them, as is the operational performance case compared to organizational performance (Combs et al., 2005; Rust et al., 2004). This means that with unpredictable and rapidly changing environments, strategic approaches focused simultaneously on both differentiation and low costs are sometimes contradictory to Porter's classic approach(Slater & Olson, 2001).

In human resources strategic management, a cost-focused approach involves most of the time high volumes and low costs and little investment in training or remuneration because of a narrow and repetitive work design (Porter, 1997). Something a little different happens with a differentiating approach in which labor is better qualified and remunerated, able to take part in operational decisions and contribute to the continuous quality improvement (Porter, 1997). Despite the above, the authors consider that in the real-world, companies implement hybrid strategies focused on multiple objectives and therefore, the "good practices" set they use may not be entirely consistent.

It is known from the statements made by Youndt, Snell, Dean, & Lepak (1996) that group incentives or cooperative rewards encourage group members to share ideas and help each other solve problems, the above because of more experienced workers having incentives to help novices. Employees have no incentive to share information or support other team members because that takes time away from them, as Johnson(2006) claims.

The macroeconomic conditions for Ecuador and Colombia show decreased and downward rates, being this a discouraging outlook which forces companies, including food, financial, transportation and construction sectors under analysis, to generate dynamic strategies, sometimes even survival, focused on optimizing resources to take care of Business Performance; so Organizational Behavior plays a preponderant role to achieve the objectives efficiently.

Great Place to Work (2020) shows that in Colombia based on the ranking, companies between 301 and 1500 employees stand out among the best places to work in the financial, transportation, technology and services sectors, while in Ecuador the most suitable sectors to work are financial, food and pharmaceutical, with more than 500 employees (Great-Place-to-Work, 2021).

Studies at company level have linked organizational culture with financial results, subtracting attention from the moderating elements; thus, this chapter seeks to contribute to literature by addressing the following question: To what extent can managers use the same practices within the organizational behavior context to meet different achievement goals?

In this study we examine the role of organizational culture as an antecedent of business performance. Culture has been defined in many ways and encompasses the entirety of a community's or population's socially transmitted behavior patterns, arts, beliefs, institutions, and all other results of human labor

and thought (Ein-Dor et al., 1993). Culture is the central focus of this paper, so it is imperative that we examine the concept in depth, especially the cultural values concept.

BACKGROUND

Organizational Culture Overview

The term "organizational culture" is a catch-all word for a style of thinking about business (Alvesson, 2011). Organizational culture refers to a shared orientation to social reality created through the negotiation of meaning and the use of symbolism in social interactions, providing a cognitive and an affective framework in an organization. Hence, the bundle of values, beliefs, assumptions, norms and symbols built by the organization members defines the way in which a firm conducts its business.

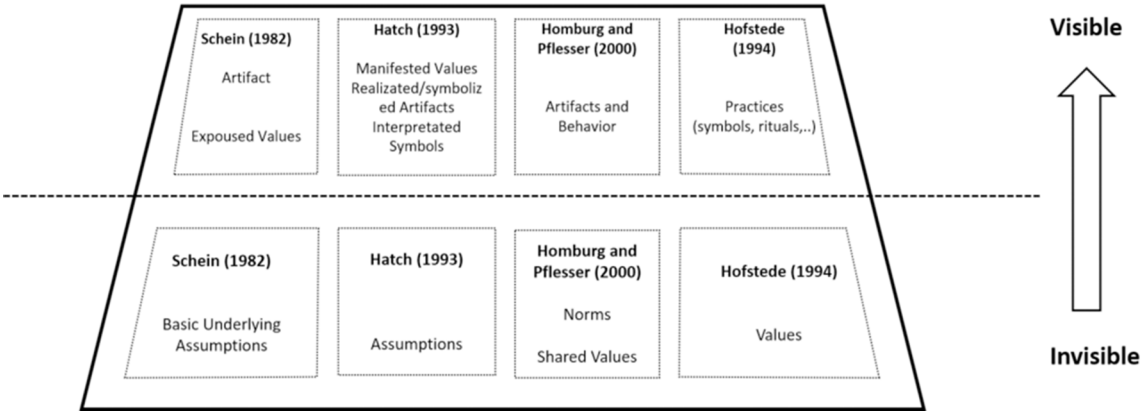
Since there is no fixed agreed meaning of culture, an organizational culture indicator has different approaches. According to Hofstede et al. (1990) most authors will probably coincide with the following qualities about the organizational/corporate culture construct: It is (1) holistic, (2) historically decided, (3) socially built, and (4) hard to change.

The internalization of organizational values should lead to a congruence of management and representatives goals, therefore the member's tasks play a fundamental role, for example, in shaping innovation processes. Nowadays, there is almost an agreement regarding organizational culture with both visible and invisible elements that define it (see Figure 1).

Schein (2010) states that "Organizational culture is a pattern of shared basic assumptions". Schein´s (1982) organizational culture model combines assumptions —invisible level— with values and beliefs —visible levels— shared by organizational members to guide them to the acceptable behavior in their organization (see Figure 1).

Hatch (1993) expands Schein's (1985) model considerably, adding a fourth category called *symbols* to the organizational culture construct and outlines the mechanisms that connect each aspect. Hatch (1993) believes there are two ways for an observable or visible behavioral layer to originate from un-

Figure 1. A comparison of different organizational culture models under their visible and invisible elements
Source: (Author, 2021)



derlying assumptions. Figure 1 shows the dynamic how underlying assumptions turn into an artifact or Hofstede's *symbols*, *heroes*, and *rituals,* that change market performance by changing corporate behavior (Homburg & Pflesser, 2000).

Homburg and Pflesser (2000) set out to create a model that might be utilized to explain the link between organizational culture and business performance outcomes. They emphasize that this association is moderated by *market dynamism* or external environment.

All organizational models provide a simplified but limited perspective on culture in organizations; however, all visible elements discussed along this section are connected with moral and ethical codes and determine what people think ought to be done and an organization often represents them through (a) formal documents, (b) mission statements or (c) speeches by senior managers that compromise its outcomes.

Business Performance

When discussing a firm's financial performance, a recent research shows that this ratio can equate the firm's indicators about the performance of its economic sector, as well as stakeholders' value-return indicators (Dzuriková et al., 2015; North, 1994). As a result, an accounting and financial analysis provides a structured framework for all business to keep track of all currency, value, and banking transactions in terms of assets, debts, and equity, which shows how many of the assigned tasks were completed fully. According to Fernandes (2014), well-known and recognized financial success metrics include DuPont's Return on Assets (ROA), Return on Equity (ROE), the assets/equity ratio, Ebit margin, net profit margin and James Tobbin's Q (QT). The set of equations used to measure these common constructs is shown in Table 1.

Table 1. Financial metrics

Financial Index	Formulae
DuPont's Return on Assets (ROA)	Profit/Asset x 100
Return on Equity (ROE)	Net profit/equity x 100
The assets/equity ratio	Assets/Equity x 100
Ebit margin	Ebit Margin/Profit x 100
Net profit margin	Net Profit/Profit x 100
James Tobbin's Q (QT)	Firm´s Total Market Value / Firm´s Total Asset Value

Source: (Author, 2021)

Organizational Culture and Business Performance

Hansen, G.S., and Wernerfelt (1989) concluded that there are two major factors that influence an organization's performance: (1) external market factors, which include characteristics of the sector in which the organization competes, the organization's position relative to its rivals and the company's resources quality; and (2) internal market factors, which include the company's resources quality, which includes (i) human resources policies, (ii) organizational culture, and (iii) leadership styles (Ogbonna & Harris, 2000).

Adaptability culture refers to an organization's willingness to encourage workers to be versatile in the workplace in order to promote creativity and innovation for the benefit of the consumer (Näyhä, 2020). Hannan and Freeman described adaptability culture as an organization's ability to remain active and intact throughout its life cycle (Hannan & Freeman, 1977). To consider that this organization's culture is adaptive, the organization should encourage (1) versatility, (2) risk-taking, and (3) trying new strategies and processes. When the levels of involvement, adaptability, or mission were high, Kotrba et al. (2012) found that organizational culture continuity had a strong positive relationship with market-to-book ratios and revenue growth when the involvement, adaptability, or mission levels were high.

Kotter (2001) argued that organizational culture is a key factor for financial growth when an organization is driven by its mission. When a company has a mission-like culture, the managers empower workers by aligning them with the mission statement, and because of the environment stability, they may turn the mission into achievable objectives and targets. In exchange, it compensates the employees with incentives and promotions based on success rather than seniority. Where (1) the degree of dedication to the task and (2) the degree to which the organizational mission is consistent with internal structure, policies, and procedures, mission statements may affect financial results (Bartet al.,2001).

In addition, Organizational Behavior (Human Resource Management practices, Human Resource systems, employee commitment, organizational culture) and Business Performance (ROA, profitability, financial performance) have established a link between them ((Becker & Gerhart, 1996); (Aguinis & Pierce, 2008). Huselid (1995) found that the employee motivation Human Resource Management scale was statistically associated with Tobin's Q. Miller & Lee (2001) argument that when an organization's commitment to its employees is strong, this will enhance the financial performance. The empirical evidence is still not strong enough to justify that conclusion (Wall & Wood, 2005). Meyer et al. (2001) concluded that not all practices of work-life balance have a significant positive effect on corporate profitability.

Organizational culture was examined by Ogbonna and Harris (2000) as a mediator between a leadership style and company results finding that competitive and creative cultural characteristics were expressed in the performance almost immediately. Competitive and disruptive cultures, which are significant in today's world, have a positive impact on results. This result lends credence to the notion that corporate culture is critical to a long-term competitive advantage. Group and bureaucratic cultures have a direct impact on company success; indeed, a negative relationship between bureaucratic culture and performance shows that bureaucratization reduces short-term profitability and impedes long-term growth which impacts the company's survival.

Hofstede's Organizational Culture Model

Culture, according to Hofstede, is a construct that expresses itself in an organization because of the organization's place within a specific society. Harrison (1994) has proposed that organizational cultures differ depending on the position, power structure, and capacity to manage the organization by expatriates who bring their own collection of national or regional cultures with them. As a result, it makes companies up of individuals who have similar beliefs and have their own organizational culture, and then, the organizational culture has six culture dimensions which are discussed below (Figure 2).

These six dimensions draw most of the variation in organizational practices and therefore will be used as a framework. Hofstede describes organizational culture dimensions as follows in Table 2 (Hofstede, 1994).

Figure 2. Hofstede's cultural dimensions
Source: (Author, 2021)

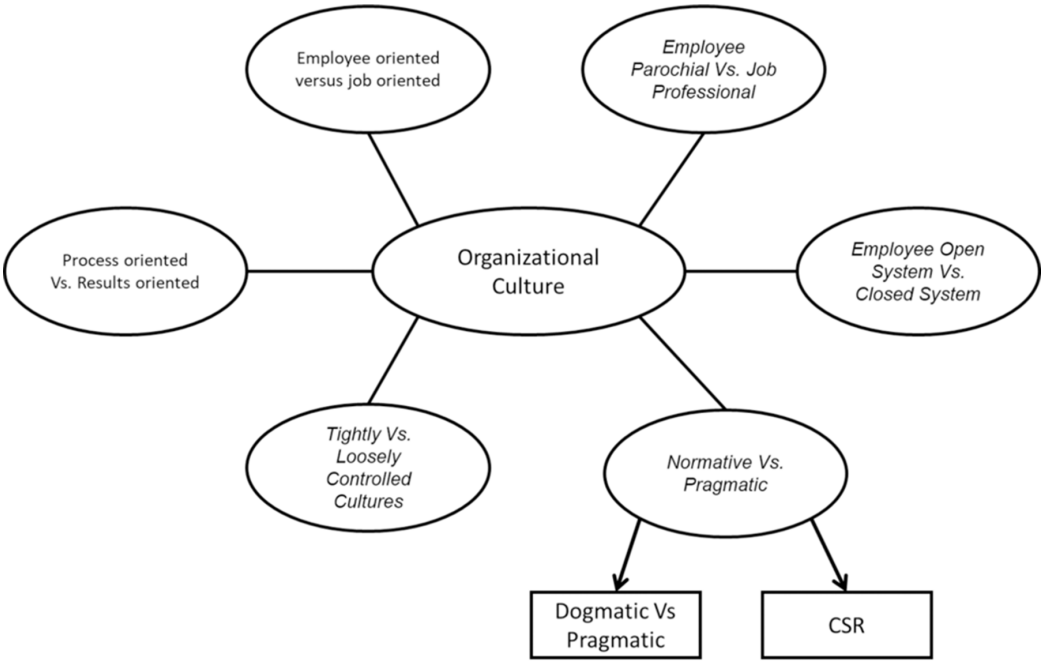


Table 2. Hofstede's organizational culture dimension

Dimension	Description
Process Oriented vs. Results Oriented Cultures	This dimension suggests a preference for processes or outcomes. In results-oriented organization, everyone regarded their activities in a similar way; in a process-oriented organization, there were significant disparities in perception across levels and areas of the unit.
Employee Oriented vs. Job Oriented Cultures	This dimension denotes the culture's preference for workers or for work. Staff of employee-oriented societies believe that their personal problems are taken into account and that the company has a responsibility to look after their well-being; then, people in job-oriented societies are under a lot of pressure to finish the task and they think the company is just interested in the work.
Employee Parochial vs. Job Professional Cultures	The way members of an organization describe themselves is represented by this dimension. Members of organizations with a professional culture are more likely to associate with their occupations. Members of parochial culture believe that the organization's standards apply to their activities both at work and at home.
Employee Open System vs. Closed System Cultures	Members of open systems take into account both the organization and its participants. They are welcoming to newcomers and strangers. Even among insiders, the company and its citizens feel restricted in closed structures.
Tightly vs. Loosely Controlled Cultures	This dimension represents the amount of internal structuring in the organization. Closed work environments are defined by people who work in tight control units. Employees in loose management units have more autonomy, and separate divisions may operate independently.
Normative vs. Pragmatic Cultures	The final dimension describes how people interact with their environment (flexible or rigid), especially with customers. On the pragmatic (flexible) side, units selling services are more likely to be found, while units enforcing legal laws are more likely to be found on the normative (rigid) side.

Source: (Hofstede, 1994)

COLOMBIA AND ECUADOR: SIMILAR HISTORIES BUT STILL DIFFERENT IN ESSENCE

There are many studies that suggest that organizational culture enhances the organization's efficiency. These studies looked into the connection between organizational culture and corporate financial performance (CFP) and came up with a variety of conclusions and findings. There are studies that show (1) positive relationships (Barney, 1986; Flamholtz, 2001) and (2) negative relationships (Barney, 1986, Flamholtz, 2001).Then, depending on the country of origin and the essence of the corporation, organizational culture takes on various forms. While different cultures exist in organizations and nations, it is difficult to say that one culture is superior to another. Different organizational cultures, on the other hand, can have a financial impact on organizational efficiency, therefore, there are various ways in which an organization can be organized.

Models and Hypotheses

We have provided six distinct dimensions that can define most of the diversity in organizational culture, but not enough to be considered universally accurate. Additional dimensions may be needed for representing organizational cultures in other countries and in different types of organizations, or some of the six dimensions may be less useful; to explore these dimensions and the literature review we propose the following models:

Model 1

Kim, Kim, & Qian (2018) claim that a competitive action should be taken into consideration when assessing the impact of CSR —Corporate Social Responsibility— programs on financial results. They discovered that when a firm's competitive action level is high, socially responsible activities boost financial performance, since this kind of activities actually improve financial performance. On the other hand, according to Cochran & Wood (1984) asset age is the financial performance variable that is most closely correlated with CSR, and omitting this implies that firms with older properties, in particular, have lower CSR scores. Therefore, we believe CSR will significantly influence financial performance (see Figure 3), and we can state our hypothesis as follows:

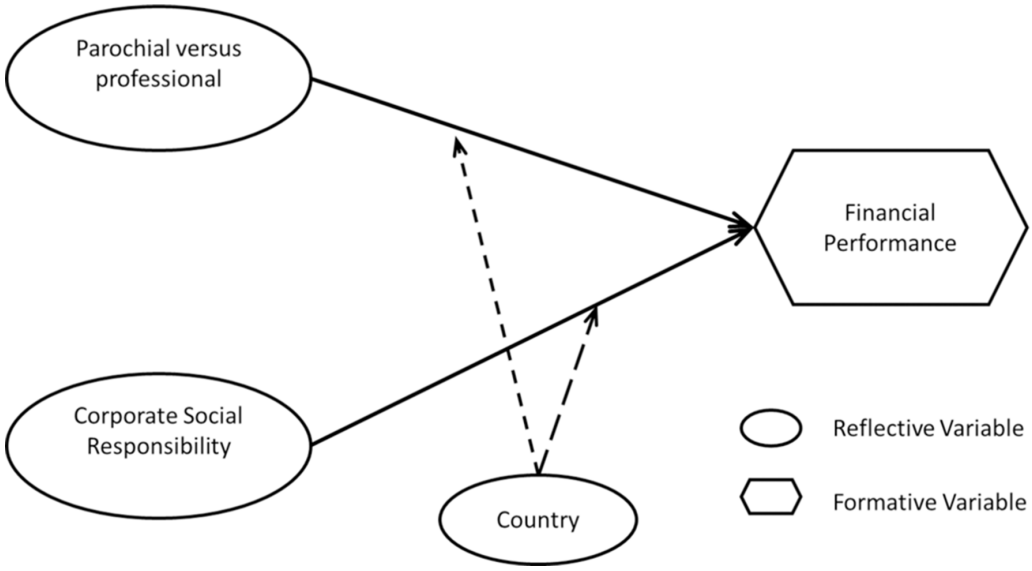
Hypothesis One: Corporate Social Responsibility will have a significant impact on financial performance.

The studies of Hofstede and Minkov (2010), and Mazanec et al. (2015) are focused on the hypothesis that national cultures are expressed in the employees culture of a specific company based in a region, Therefore, we state hypotheses 2 and 3 as follows:

Hypothesis Two: The influence of parochial vs professional dimension (PP) on the financial performance will be moderated by the company's country of origin.

Hypothesis Three: The influence of CSR on the financial performance will be moderated by the company's country of origin.

Figure 3. Proposed model 1
Source: (Author, 2021)



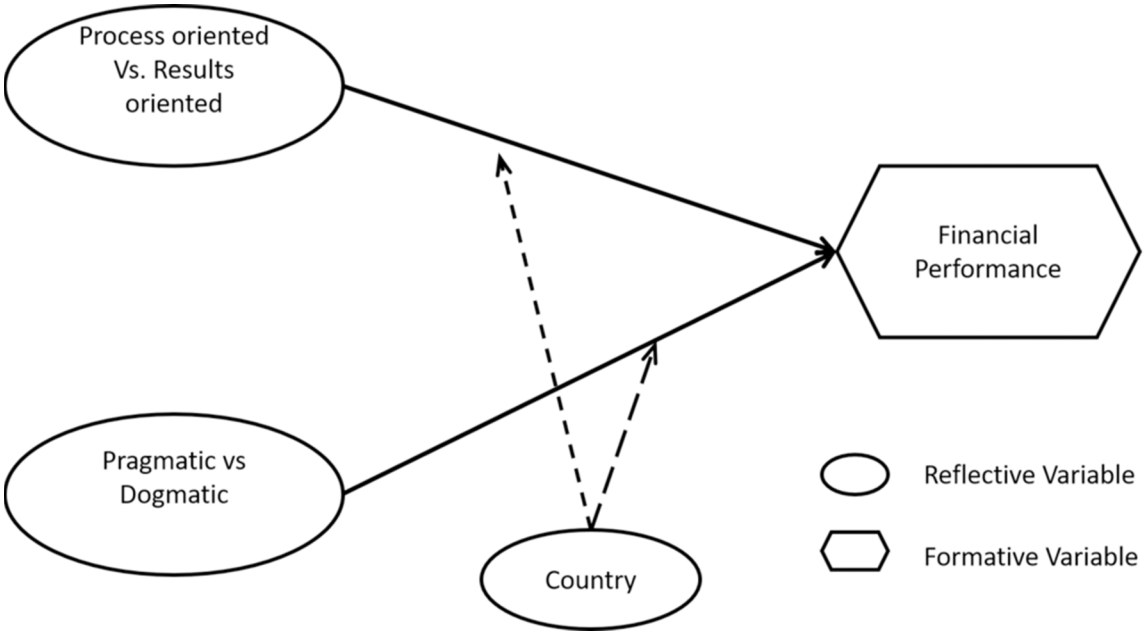
Anguinis and Pierce (2008), remarked on a relation between business performance and organizational behavior. Employees connect strongly with their employers and/or the unit in which they work and short-term guide; they are expected to act like everyone else (Yu & Frenkel, 2013). In such an organization, employees are more focused on the organization's internal affairs than on achieving short-term goals (G. Hofstede & Minkov, 2010). Individual development is encouraged in this kind of organization led by a professional culture (Chang et al., 2017; Naqshbandi et al., 2018). Employees in such a company are identifiable by the work they conduct and also are focused on long-term goals and the bigger picture of their environment (G. Hofstede & Minkov, 2010). This promotes the discovery of new areas of expertise and stimulates information exchange. In addition, according to Miller and Lee (2001), a company's financial results will increase if it has a good commitment to its workers, therefore, we propose:

Hypothesis Four: PP will influence financial performance.

Model 2

People who are process-oriented avoid taking chances and put out a limited amount of effort in their employment (Radnejad & Vredenburg, 2019). If they do not have a clear knowledge of the task process, they get apprehensive and unsure. The more activities to share knowledge are included into the work process, the more employees are expected to contribute with their information (Kohlbacher, 2010). According to Zang and Wang (2019), using both the Theory of Planned Behavior (TBS) and the goal-oriented behavior model (MGB), employees in a goal-oriented culture focus on what has to be accomplished and will take chances; also they will do whatever it is necessary to finish a task with little or no guidance (Cote, 2017; Zhang & Wang, 2019). Employees that work in this environment are more likely to share their knowledge, then we state, as we can see in Figure 4, the following hypothesis:

Figure 4. Proposed model 2
Source: (Author, 2021)



Hypothesis Five: Process Oriented vs Results Oriented culture will have a significant impact on financial performance.

In the previous section we mentioned that Hofstede and Minkov (2010) and Mazanec et al. (2015) said that national cultures are reflected in the employees culture of a particular organization located in a region. Besides, according to Miller and Lee (2001) and Anguinis and Pierce (2008), if an organization has a deep commitment to its staff, its financial performance will improve, then we state hypothesis 6 as follows:

Hypothesis Six: The influence of Process Oriented vs Results Oriented dimension (PORO) on financial performance will be moderated by the company's country of origin.

According to Hofstede and Minkov (2010), an organization that wants to have a well-established knowledge base and a solid knowledge-sharing profile would need to be more practical with the outside world. He believes that the company will squander time analyzing the value expectations of various client groups rather than focusing on areas where they can improve to gain a competitive advantage, therefore, we propose:

Hypothesis Seven: The level of pragmatism exhibited by an organization would have a direct effect on its financial performance.

Hypothesis Eight: The influence of how pragmatic a company is on financial performance will be moderated by the company's country of origin.

Survey Design and Data Collection

An electronic questionnaire supplied during the first months of 2021 was used to collect data on organizational culture in both Ecuador and Colombia. The questionnaire consisted of 18 items based on the instrument developed by Hofstede and subsequently adapted (Table 3). In addition to 9 items of demographic information, this electronic questionnaire collected employee data on a series of constructs identified in the Hofstede model. Each of the six (6) dimensions of the organizational culture were taken into

Table 3. Questionnaire dimension and item

Construct	Dimension	Initial	Item
Organizational Culture	Process oriented Vs. Results oriented	PORO 1	Employees always give everything in their work.
	Process oriented Vs. Results oriented	PORO 2	At work, we are often faced with new challenges.
	Employee oriented versus job oriented	EOJO 1	The company where I work just cares about the work that workers do.
	Employee oriented versus job oriented	EOJO 2	The company where I work is unconcerned about personal issues of its workers.
	Employee oriented versus job oriented	EOJO 3	The working environment receives very little consideration.
	Employee oriented versus job oriented	EOJO 4	Management is more concerned with organizational issues than with managerial issues.
	Parochial versus professional	PP 1	The level of collaboration and trust between departments is sufficient.
	Parochial versus professional	PP 2	Changes are made in accordance with the employees needs.
	Parochial versus professional	PP 3	Our management makes every effort to assist employees in advancing in their careers.
	Parochial versus professional	PP 4	We always get feedback from supervisors about our performance
	Parochial versus professional	PP 5	Supervisors often give us input on how we're doing.
	Open system versus closed system	OSCS1	We welcome new hires as well as job seekers.
	Open system versus closed system	OSCS2	New employees soon find support at work and within the team to help them adjust.
	Open system versus closed system	OSCS3	New staff needs only a few days to adjust to the working environment
	Loose versus tight control	LT 1	We are notorious for being late to meetings at the scheduled time.
	Loose versus tight control	LT 2	We seldom consider how much work costs (materials, equipment, etc.)
	Normative versus Pragmatic	NP 1	The company does not give very significant contribution to society
	Normative versus Pragmatic	NP 2	We are more pragmatic than dogmatic (pragmatic = inclination towards the practical, dogmatic = relatively inflexible)

Source: (Author, 2021)

consideration. We used this questionnaire to collect data from 59 individuals in a total of 43 companies. The survey was administered in Spanish language as it is the predominant language in both countries. Each item in the survey used a 5-point Likert scale (Hofstede, Neuijen, Ohayv, & Sanders, 1990).

The financial information was extracted from EMIS, the financial and market information platform. Only 23 companies out of all of them have such data registered in EMIS, having 31 records to feed both model 1 and model 2. For each case, (1) operating ROA, (2) total ROA, (3) operating margin, (4) net margin, (5) asset vs equity ratio and (6) ROE, were calculated annually. All these indicators are used in previous works to measure financial performance, as previously described. For each indicator, the linear trend slope was calculated for the period of time between 2015-2019.

We performed a partial least squares (PLS) regression analysis to test the hypotheses in our research models. The dimensions with the greatest significance after performing a principal component analysis (PCA), see Table 5, were (1) Process Oriented Vs. Results Oriented, (2) Employee Parochial Vs. Job Professional and (3) Normative Vs. Pragmatic Cultures. In PLS, we configure financial performance as a formative construct with the six indicators. The rest of the model for the PLS regression analysis was configured according to our research model (see Figure 3 and 4). A formative construct refers to an index of a weighted sum of variables.

After the process-oriented vs outcome dimension is considered, as well as the mean value of employee responses (see Table 4), it can be inferred that the staff is centered on producing concrete results. Taking into account the employee oriented versus job-oriented factor (items from EOJO1 to EOJO4, Table 4),

Table 4. Descriptive statistics for each item of the organizational culture questionnaire

Item	Mean	Std. Deviation	Analysis N
PORO1	4.08	0.726	59
PORO2	4.42	0.792	59
EOJO1	3.56	1.222	59
EOJO2	3.42	1.177	59
EOJO3	2.71	1.274	59
EOJO4	3.17	1.101	59
PP1	3.75	0.939	59
PP2	3.58	1.133	59
PP3	3.37	1.272	59
PP4	3.68	1.058	59
PP5	2.78	1.146	59
OSCS1	3.85	1.111	59
OSCS2	3.85	1.031	59
OSCS3	3.58	1.235	59
LT1	2.12	1.415	59
LT2	2.66	1.295	59
NP1	2.29	1.403	59
NP2	3.59	1.052	59

Source: (Author, 2021)

Table 5. PCA extracted components

Item	Component				
	1	2	3	4	5
PORO1	0.138	0.747	0.082	-0.062	-0.015
PORO2	0.448	0.625	0.073	0.077	-0.103
EOJO1	-0.118	0.461	0.532	-0.323	0.018
EOJO2	0.787	0.189	-0.124	0.009	0.193
EOJO3	-0.135	0.036	0.729	0.271	0.100
EOJO4	-0.148	-0.047	0.835	0.064	0.165
PP1	0.670	0.384	-0.149	-0.129	-0.095
PP2	0.755	0.150	-0.022	-0.170	-0.147
PP3	0.797	-0.245	-0.055	0.033	-0.144
PP4	0.590	0.399	-0.262	-0.182	0.185
PP5	0.586	0.037	0.055	-0.018	0.662
OSCS1	0.561	0.143	0.344	0.116	-0.291
OSCS2	0.745	0.332	-0.269	0.012	0.019
OSCS3	0.639	0.211	-0.267	0.040	0.098
LT1	-0.126	-0.260	0.234	0.713	0.196
LT2	0.006	0.132	0.049	0.840	-0.016
NP1	-0.218	-0.041	0.279	0.181	0.719
NP2	0.451	0.493	-0.225	0.315	0.146

Source: (Author, 2021)

the organizational culture reflects a company's culture in which management is a little more concerned with the work of employees than with the employees themselves. Furthermore, staff members appear to believe that the administration does not adequately understand their working environment. According to the average response scores about Parochial versus professional dimension, the organizations studied put a high value on honesty, with each employee treating their personal life as a private matter.

Based on the findings in an open system versus a closed system factor, it can be concluded that organizational culture is fully accessible. Newcomers are accepted, which ensures that everybody easily adapts to teamwork and is completely integrated into the university community within a few days.

With a mean score of 2.29 (Table 4), the majority of respondents believe that companies do make some contribution to society. On the last statement of the questionnaire, if the organization is more pragmatic than dogmatic, the mean score is 3.59, with the primary emphasis on objectives achievement.

Organizational Culture Findings in Colombian and Ecuadorian Companies

In this part we will go over the findings about comparing the organizational cultures of companies in the same economic sector in both countries studied, as well as the relationship between some of the dimensions of organizational culture and financial performance, according to models 1 and 2.

Differences Between Colombian and Ecuadorian Companies Related to OC

D'Alessio-Ipinza (2016) expressed how the firm's mission and vision are a key to a successful strategical process. Our findings, as seen in Figure 5, show that Ecuador has a greater participation within transport segments, this proved to be consistent with what D'Alessio-Impiza (2016) published, as it enhances financial performance; for further insights please refer to Model 1 results.

Ecuador exhibits greater participation in the transport sector (Figure 5) by achieving a better impact on financial performance (see results of model1), therefore, related to the D'Alessio-Impiza´s exposure. (2015).

Figure 5. Involvement index between Colombian and Ecuadorian economic sectors
Source: (Author, 2021)

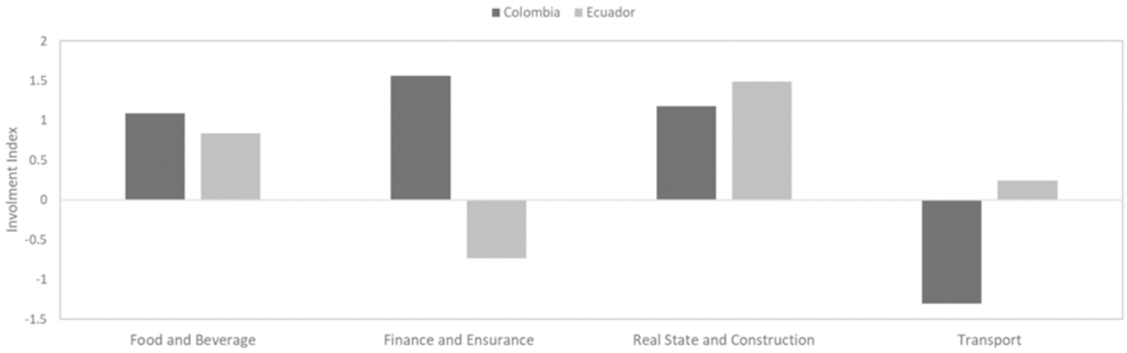
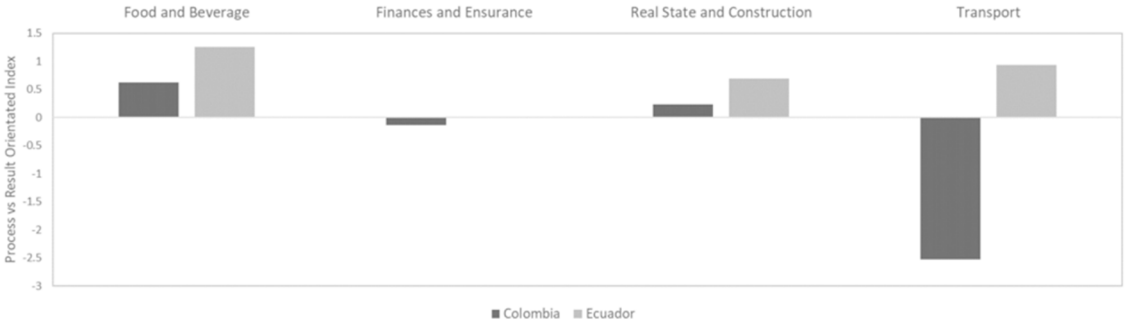


Figure 6. Process-Results index between Colombian and Ecuadorian economic sectors
Source: (Author, 2021)



Ecuadorian banking is more regulated than Colombian banking (Figure 6), which makes this banking culture characterized by being more bureaucratic. This result is aligned with Cerutti et al (2005).

The objective-based approach predominate over processes in the Ecuadorian culture. The latter undoubtedly marks that in Ecuador goals achievement drive the day-to-day organizational culture.

Colombian and Ecuadorian Companies Made it Different

In this section we will discuss the results that models 1 and 2 produced after using PLS. Firstly, since CSR was measured by a single item which is "the company does not give very significant contribution to society", this result is consistent with Kim, Kim, & Qian (2018), because both countries are not characterized as a competitive framework, where better CSR policies improve firm's financial performance. As mentioned above, the relationship between parochial vs professional and financial performance (see Figure 7) is consistent with D'Alessio-Ipinza (2016), as well as with Kotter (2001), when an organization is driven by its mission. The values next to the arrows in PLS regression results (Figure 7) are the weights of both Parochial vs professional (PP) and CSR relation with Financial Performance, when in the case of PP is 0.606 and with CSR is 0.313. In both cases the significance is less than 15%; then under this work limitations, the results suggest open discussion for further research.

Figure 7. Model 1 PLS outputs, dG =2.24<HI99=17.24
Source: (Author, 2021)

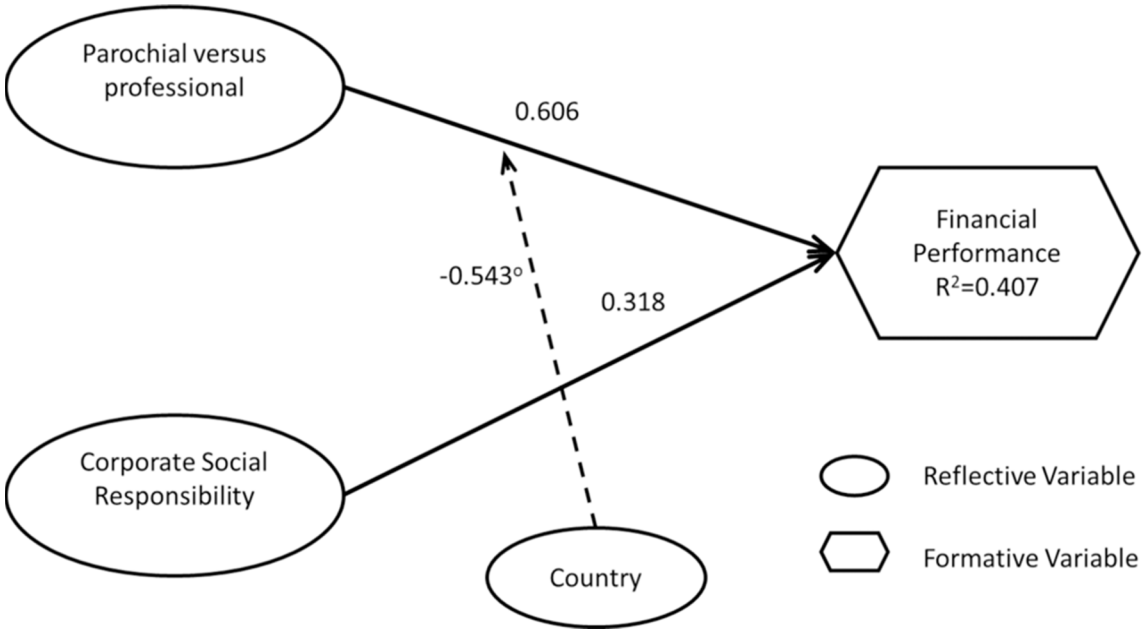


Table 6. Squared correlations and AVE in the diagonal

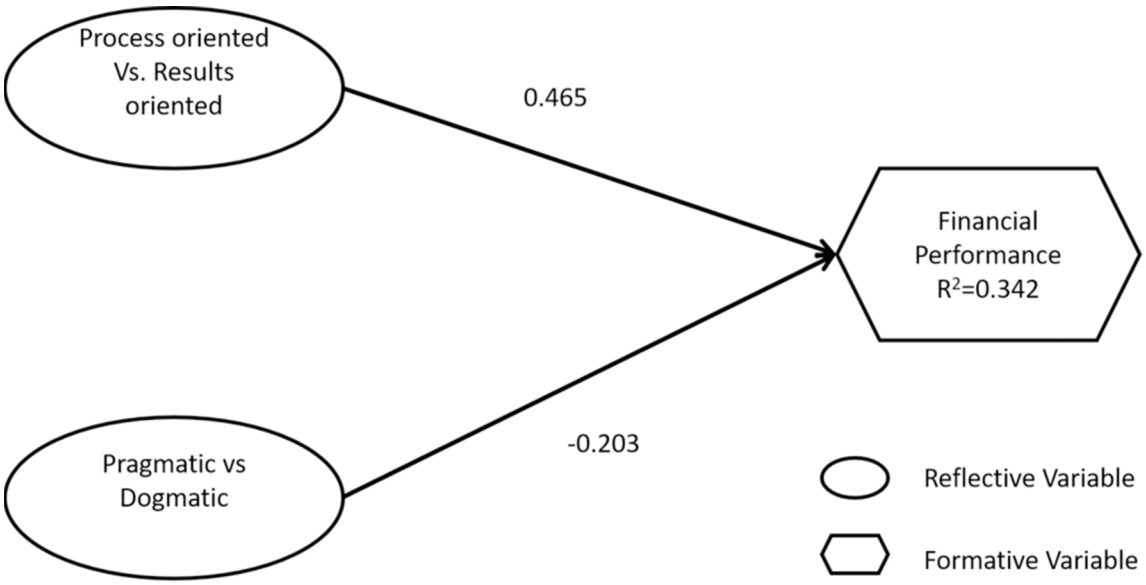
Construct	Financial Performance	CSR	PP	Country
Financial Performance				
CSR	0.0300	1.0000		
PP	0.0992	0.0520	0.1709	
Country	0.0874	0.0002	0.1617	0.9503

Source: (Author, 2021)

The correlations between variables were less than 0.60. (AVE) average variance extracted values for individual constructs were greater than 0.8 in CSR and Country moderator effect and the correlations with other constructs in our sample were also greater; therefore, despite AVE for PP is less than 0.6 (see Table 6) AVE of Country moderation and its significance of less than 5% suggests that Model 1 outputs are consistent with it.

The weights of both PORO and pragmatic vs dogmatic relationships with Financial Results are 0.465 and -0.203, respectively (see Figure 8). The significance of both cases are less than 15%. Also country does not moderate both influences, hence both Ecuadorian and Colombian companies work under the same management paradigm about achieving specific results.

Figure 8. Model 2, PLS outputs, dG =3.24<HI99=16.23
Source: (Author, 2021)



SOLUTIONS AND RECOMMENDATIONS

This chapter discloses an ongoing dispute between what collaborators believe their impact on society to be and what is evident; findings previously mentioned show that workers perceive that they are contributing to society through their work; however, there is no real evidence to back this perception; hence, CSR must be understood under different circumstances.

This lack of evidence, according to what the data presented, is due to the fact that firms in both Colombia and Ecuador must often aim towards short-term financial objectives as their strategic routes are thought over volatile social, economical and political environments.

As a result, CSR and Employee Welfare must be analyzed under parameters fitted to developing and emerging economies instead of metrics used for stable - already developed - economies.

Another dynamic seen is that organizations are realigning their ethical codes and cultural outlines as the environment strengthens; turbulent as it might be, these changes impede firms from generating stronger structures, thus inhibiting job creation. Henceforth, even though workers achieve goals through result-oriented dynamics, there is still a gap to attain the best results when assessing each collaborator's performance.

FUTURE RESEARCH DIRECTIONS

This study presents a descriptive analysis between two neighboring economies, namely Colombia and Ecuador, but it is limited because of its sample size, hence further iterations should follow to reinforce the findings we presented.

Through these models, results proved to be consistent with what scholars expect from the relation between the initial stages of any strategic process and the performance at the end of each iteration; however, several mediating constructs might be present but hidden due to the small comparison that included only two nations´ yields; in order to improve the reliability of these models, adding other countries is a must.

Colombia and Ecuador have similar histories and have cultures that can be similar to a high level but still different in essence; thus, findings in which the constructs differ in behaviors was not surprising; actually, it argues that there is a degree of complexity relating how firms and societies relate for each country.

A logical extension for this study would include a comparison between regions in which cultural differences are well determined and should enlist a higher number of firms per economic sector. This is just the tip of the iceberg, hence presenting a probe study that promises interesting and research-worthy grounds for further development on this subject's knowledge.

CONCLUSION

This study tested all proposed hypotheses, finding that Model 1 and Model 2 are accurate within a 15% tolerance. These results are acceptable given that this study was a probing stage study. Both models yield conclusions that open a path toward redefining the effects of uncertainty and randomness within the business environment.

- Unpredictability and variability within corporate's environments have an effect on performance that might actually contradict Porter's classic approach.
- Differentiation and Cost-minimization as strategic approaches also had an effect and yielded similar results.

These conclusions find that with unpredictable and rapidly changing environments, strategic approaches focused simultaneously on both differentiation and low costs are sometimes contradictory to what Porter's classic approach states regarding financial performance (Slater & Olson, 2001).

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KEY TERMS AND DEFINITIONS

Corporate Social Responsibility: Refers to the commitments and actions that a company's administration has with today's society, which are primarily based on the potential impacts that its activities may have on its environment.

Culture: Socially taught shared patterns of behavior and cognitive frameworks, as well as, their comprehension and interaction, own by a group of people or society. Religion, what we wear, how we wear it, what we believe is right or bad, how we greet visitors, and so on all fall under the category of culture.

Employee Commitment: It describes the extent to which an employee identifies with and is linked to a firm.

Financial Performance: The main performance category used to examine company's ability to use assets in evaluating its performance. Financial ratios like return on sales, return on assets, EBIT margin and James Tobbin's Q are some examples of key indicators used to measure company's financial performance. (Gurcaylilar-Yenidogan and Aksoy, 2020).

Human Resource Policies: Firms' explicit rules and standards for guiding the logic of skills developed in accordance with the requirements of business operations such as hiring, training, and assessing, among others.

Organizational Culture: Culture formed by beliefs and values that are established and communicated by the leaders of an organization, which ultimately shapes the perceptions, behaviors and understanding of its internal customers.

Profitability: The amount of profit or financial gain generated by a company or activity. It is calculated by the ratio of profit to the capital used to create such profit.

Chapter 20
Open Innovation Model Proposal for the Colombian Air Force

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ABSTRACT

An organisational model in open innovation is proposed for the Colombian Air Force that could be implemented in the institution or in other military entities, as well as in companies with hierarchical structure. It includes a new perspective of the articulation of the university, enterprise, and state with the theoretical foundations of open innovation. The main objective of this research was to design an open innovation (OI) model to articulate the actors of the Science, Technology, and Innovation System (ST&I) of the COLAF, throughout a qualitative approach of documentary review, where variables of open innovation, internal, and the external factors of open innovation were defined for the subsequent construction and proposal of the model. Concluding, the construction of this OI model for the COLAF could allow an inclusive and binding model of Colombian society with university, enterprise, and state to join efforts and to cooperate for achieving an stable innovation ecosystem.

INTRODUCTION

Throughout its 100 years of history, the Colombian Air Force has solved operational needs by applying processes based mainly on technological development. In 2004, the Directorate of Science, Technology

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and Innovation was created, which allowed a timid approach with universities to strengthen capacities in advanced knowledge and formalisation of Science, Technology, and Innovation (CTeI).

Subsequently, in 2005, the Oslo Manual was published, which defines innovation as the introduction of a new or improved product, good or service, and presents innovative activities that correspond to all scientific, technological, organisational and financial operations. It also defines four types of innovation: 1. product innovation, 2. process innovation, 3. marketing innovation and 4. organisational innovation (Ocde, 2005).

In coherence with Oslo manual, the COLAF directly establishes the types of innovation in process, product, organisation and indirectly innovation in marketing, but these innovation activities are carried out through a traditional and closed technological management model. However, a conceptual change in this field is required inside the COLAF using the study and application of innovation concepts as an organisational strategy.

Later, in 2009, formal processes of knowledge protection were initiated. Likewise, in 2013, the need to strengthen innovation processes through national and international allies for the transfer of R&D&I products developed by the COLAF was understood. However, given the new national and global challenges in terms of competitiveness, and the fulfilment of the national policy of contributing as a state entity in the construction of the social and economic fabric of the country, the COLAF is required to venture into a new model different from the traditional innovation model that has immersed the benefits of open innovation.

According to above situation, the following research question was posed:

How can the COLAF articulate the actors of its Science, Technology, and Innovation System?

To answer this question, the following objectives were proposed:

General Objective

To design an Open Innovation model that allows the articulation of ST&I in the COLAF.

Specific Objectives

To identify the actors of the ST&I of the COLAF.

To determine the internal and external factors for an open innovation model according the ST&I of COLAF.

To develope these research objectives, this chapter seeks to describe a model of AI, to understand the social and technological changes, the growth of knowledge and its democratisation (Group, 2009); and in this way, it is possible to take advantage of both internal and external resources of each actor of the FAC's ST&I, in the creation and transfer of Research, Technological Development and Innovation (R+D+i) products.

CONCEPTUAL FRAME

Open Innovation

The commonly accepted concept of Open Innovation (OI) describes it as the use by organisations of knowledge inputs and outputs to accelerate internal innovation and expand the market for external use of knowledge. In other words, companies that want to maximise value creation can and should make use of both external and internal knowledge, and it is recommended that they use the various existing means of market access (Chesbrough, Vanhaverbeke & West, 2006).

Internal and External Factors of OI

The internal and external factors proposed by González & García (2011), which are necessary for the management or design of open innovation models in organisations, are presented below:

OI Internal Factors

- Liaison posts: These are the mechanisms that facilitate relationships and contact that must be coordinated (Lloria y Peris, 2007), also as mechanisms for strengthening the commitments of the members of the institution to open innovation (Kale y Singh, 2007). Likewise, regular meetings are held to exchange best practices and experiences with the internal actors of the innovation ecosystem (González y García, 2011).
- Search Routines: are stable patterns of behaviour that characterise the reactions of entities to stimuli of context and areas of knowledge or diverse nature. (Zollo y Winter, 2002). Two types of routines are defined: routines of the first type refer to the execution of knowledge procedures to maintain the current level of profits, and routines of the second type or search routines involve the search to increase profits in the future. (Teece, Pisano, y Shuen, 1997).

New combinations of resources and capabilities are required to guide innovation ecosystem entities and actors in absorbing and exploiting the new knowledge generated. (Powell, Koput, y Smith-Doerr, 1996).

- Proactivity Incentives: Incentives can be divided into individual incentives and group incentives, the former are oriented to discriminate incentives adapted to individuals and this will allow these individuals to dedicate their efforts to the development of the ACTI for the benefit of the group. (Olson, 1965).

On the other hand, group incentives are oriented towards group-based incentives to reduce differences and inconsistencies and inconveniences between group members. (Xie, Song, y Stringfellow, 2003).

- Strong and Cooperative Culture: Generate a change of mentality, which shows cooperative behaviour when working with ideas, technology and knowledge. (Herzog y Leker, 2010).

Likewise, to promote training in the members of the innovation ecosystem to build a culture oriented towards activities of producing, sharing and assimilating information and knowledge, in order to generate

competitive advantages based on dynamic capabilities, with an organisational structure adapted to this new challenge. (Feldman y Pentland, 2003).

OI External Factors

- Technical and Expert Leadership: Leadership and technical knowledge and previous or past experience in similar open innovation processes for different projects or ACTI contribute to more successful outcomes. (Lee y Cole, 2003; Stewart, 2005).
- Multilateral ICT communication: Information and communication technologies increase the possibility of collaborative learning, as well as the open communication of the actors in an open innovation process contributes to an open, sincere communication with principles of trust, confidentiality and loyalty, reduces selfish behaviour, favouring the success of the work and ACTI proposed. (Bstieler, 2006).
- Neutrality of Intermediate Actors: These are the actors between the central actor and the peripheral actors, they are considered key because they allow the construction and maintenance of good relations between the actors of the open innovation ecosystems. These intermediate actors must act in a neutral way to facilitate the exchange of knowledge and cooperation with resources and capacities for the formulation, design and development of ACTI and tasks set. (Nooteboom y Stam, 2008).

It is also important to conceptualise Dimensions, Components and Principles of an OI Model, as explained below:

For this research, we took into account the dimensions, components and principles (See Table 1) that were defined and validated in the doctoral thesis "Collaborative Open Innovation Model for Development Banking: Bancoldex Case". (Ramírez, 2015), which were validated in this research under statistical and theoretical rigour.

Table 1. Dimensions, components and principles of an OI model

Dimensions	Components	Principios
Collaborative processes Innovation networks Value creation	Innovation challenges Internal and external knowledge Paradigm shift Leadership Inter-institutional, transdisciplinary team Communication telling story Creative solutions	Identity Agreements Flexibility Commitment Recognition Trust

Source: By Author based (Ramírez, 2015).

UK OI Model

According to James, (2009), in the UK after the Cold War and because of declining budgets in both Europe and the United States for Defence Research Centres and Laboratories, forced the search for new

management models and the development of dual technology products, in other words, technologies for both military and civilian use.

The UK was the most radical in responding to the challenges of the post-Cold War era, where the management reform of most government defence research establishments (GDREs) was privatised.

Measuring the impact of these changes in the defence sector is not easy to do, given that there are no solid metrics publicly available, plus the factor that research in most cases offers long-term results, sometimes lasting as long as 20 years.

However, it is important to note that in order to counteract the budget decrease established by the UK, some of the main achievements of this change in the GDREs' management policy was the search for new sources of funding to try to balance the deficit, as well as to bring the activities developed by these centres and defence laboratories much closer to their clients and align them with their real needs.

In the early 1990's, the UK created the Defence Research Agency (DRA) as a semi-autonomous body made up of the non-nuclear laboratories, then the non-nuclear laboratories that had not initially joined in the initial change were associated and the Defence Evaluation and Research Agency (DERA) was created in 1995. The main changes were the integration of the private sector and the application of civilian laboratory management policies, and it was placed under the leadership of an executive who was not from the defence system but who had experience in defence software development.

Its orientation was based on the contractor-client relationship, but two lines of business were generated, one focused on defence sector clients and the other on non-defence sector clients, which contributed to an increase in its income mainly in the non-defence line of business, which generated disagreements in the industrial sector because they began to consider the agency as competition.

This DERA agency by 1998 was split into two entities, one the Defence Science and Technology Laboratory (DSTL) in charge of sensitive lines of research for the defence sector; the other the QINETIQ was a full privatisation that allowed the US to enter as a shareholder and for knowledge sharing, however, the MOD began to have concerns about intellectual property issues and high costs for research and innovation development.

Then the Ministry of Defence (MOD) implemented an open innovation strategy that incorporated part of the principles of DERA and extrapolation of knowledge obtained in the QINETIQ, created the towers of excellence to integrate university, private sector and state capabilities. This allowed for a new Research Acquisition organisation, which responded to the needs and strategies of the Defence Sector.

US Defence Sector Model

During the Cold War, significant resources were allocated to the US defence sector, where technical development and readiness were paramount, with analysis of redundant capabilities, inefficient practices and economic efficiency in the background. (Flamm, 2000).

In 2000, policy changed in the United States and sought to promote technologies more from the commercial sector than from the defence sector, encouraging the use of commercial technologies and products in the defence sector, as well as broadening the base of commercial competitors.

The US defence industry is recognised worldwide for the integration of specialised skills and technologies, which is why the US is a tier one producer of defence technologies and maintains steady or increasing exports despite declines in global military budgets.

The US defence industry is grouped into six major clusters:

- Aircraft and aircraft engines
- Artillery and annunciation
- Tanks and armoured vehicles
- Ship repair and construction
- Space systems and guided missile systems
- Defence Electronics

The largest economic outlet is the defence electronics group, which outperforms the other groups by a large margin, these technologies have been commercialised mainly with US allies.

A successful case of an open innovation system derived from the US defence system is the Defence Advanced Research Projects Agency (DARPA).

The case of DARPA agency was analysed by (Dugan y Gabriel, 2013) where a large number of consistent and sustainable radical innovations were found, such as the internet, RISC computing (Reduced Instruction Set Computer), global positioning satellites, stealth technology (that used to increase the invisibility of defence equipment and personnel), unmanned aerial vehicles or drones and microelectronic mechanical systems (MEMS) among others, which are now also of dual application (military industry and also applied to civilian commercial industry). This agency has 3 pillars as its fundamental elements (see Table 2):

Table 2. Pillars of the research agency of advanced research projects in defense DARPA

Ambitious Goals	Temporary Specialised Teams	Independence
Agency projects are designed to harness advances in science and engineering to solve real-world problems or create new opportunities in defence. GPS was an example of the former and stealth technology an example of the latter. Problems must be sufficiently challenging such that they cannot be solved without leveraging or catalysing science. The presence of an urgent need for an application creates focus and inspires further ingenuity.	It brings together world-class experts from industry and academia to work on projects of relatively short duration. Team members are organised and led by fixed-term technical managers who are accomplished in their fields and have exceptional leadership skills. These projects are not open-ended research programmes. Their intensity, sharp focus and finite time frame make them attractive to highly calibrated talent, and the nature of the challenge inspires unusual levels of collaboration. In other words, the project gets great people to tackle great problems with other great people.	By organisation chart, DARPA has autonomy in selecting and carrying out projects. Such independence allows the organisation to move fast and take big risks and helps them persuade the best and brightest to join.

Source: By Author.

Innovation Networks Based on the Open Innovation Model in Brazil

In Brazil, the complementarity of resources that extend beyond the companies was incorporated, with the purpose, to make orchestration of networks for innovation, promoting the approach of dynamic capabilities, to achieve competitive advantages in Brazilian companies (Da Silva, 2016).

Specific processes and actions are presented that constitute a dynamic capability (agenda setting, mobilization, knowledge mobility, knowledge appropriability, network stability and coordination). This capability is generating opportunities for orchestration of innovation networks, where innovation network managers, can take decision and action on non-shared and shared resources in the network and

on the structural asset that represents the innovation network itself. This allows them a more precise understanding of the managers' roles within a Resource Based View (RBV), where they can understand how open innovation is performed from this perspective.

As main contributions of the orchestration of networks based on the open innovation model are the following (Da Silva, 2016):

"(a) an integrated view of the existing literature in the strategy field on the resource-based view and dynamic capabilities, as well as (b) extends the discussion on resource portfolio management beyond the boundaries of the firm towards the understanding of resource orchestration (resource management and asset orchestration), promoting (c) a focus on dynamic capabilities in complementary fields of research, in this case, open innovation. It enables managers of innovation networks to (d) understand how managers' actions in and on the innovation, network enable improved firm performance and competitive advantage."

Science, Technology, and Innovation in Colombia

In 2009, Law 1286 was passed, making COLCIENCIAS an administrative department of the country. (Congreso de Colombia, 2009), this law establishes a productive model for Colombia, based on science, technology and innovation, to give added value to the products and services of the Colombian national economy, and thus promote productive development and a new national industry.

This law 1286 of 2009 also establishes objectives for all public and private institutions and entities in which the following stand out:

- Strengthen a culture based on the generation, appropriation and dissemination of knowledge and scientific research, technological development, innovation and lifelong learning.
- Incorporate science, technology and innovation as transversal axes of the country's economic and social policy.
- Transform the National Science and Technology System into the National Science, Technology and Innovation System (NSTIS).
- Strengthen the impact of the NSTIS in the social and economic, regional and international environment, in order to develop Colombia's productive, economic, social and environmental sectors, through the training of integral, creative, critical, proactive and innovative citizens, capable of making transcendental decisions that promote entrepreneurship and the creation of companies and that constructively influence economic, cultural and social development.
- Define the administrative and financial instances and instruments through which the allocation of public and private resources to the promotion of Science, Technology and Innovation is promoted.
- Articulate and optimise the instances of leadership, coordination and execution of the Government and the participation of the different actors of the Science, Technology and Innovation policy.
- Strengthen regional development through comprehensive policies of decentralisation and internationalisation of scientific, technological and innovation activities, in accordance with international dynamics.
- Orientate the promotion of scientific, technological and innovation activities towards the improvement of competitiveness within the framework of the National Competitiveness System.
- Establish general provisions that lead to the strengthening of scientific knowledge and the development of innovation for the effective fulfilment of Law 1286" (Ley 1286, 2009).

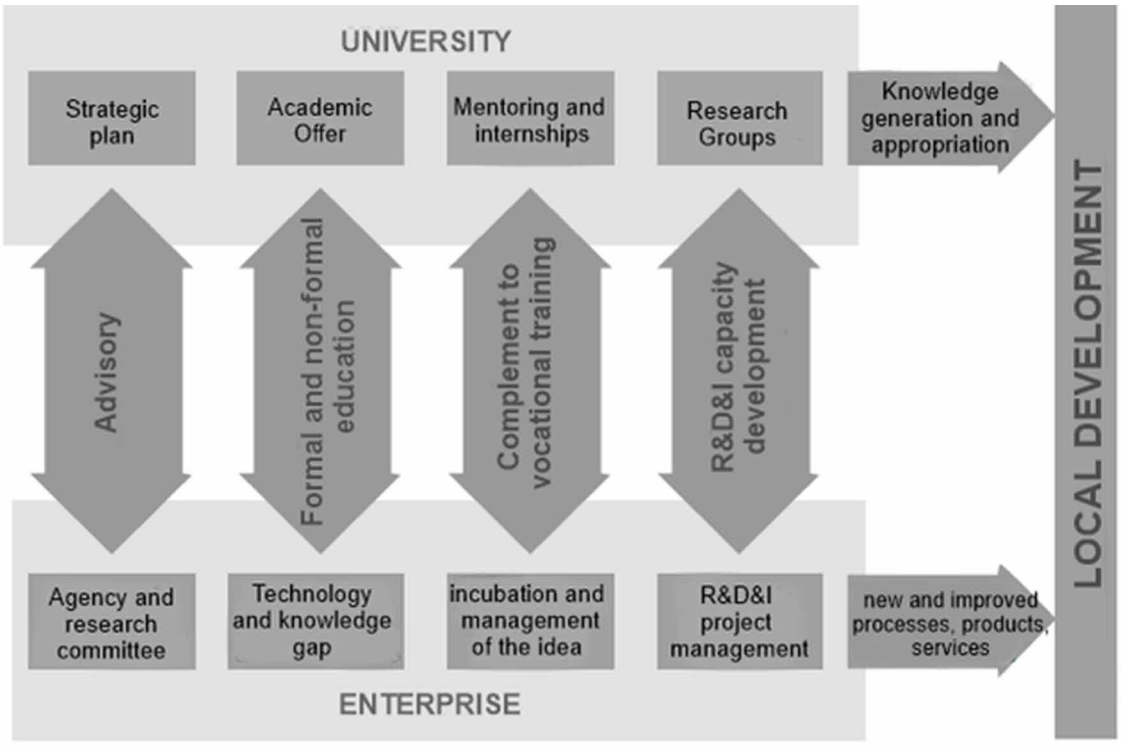
Knowledge Based Innovation Model (Cotecmar Case)

The Corporation of Science, Technology and Innovation for Naval, maritime and river industry Development (Corporación de Ciencia, Tecnología e Innovación para el Desarrollo de la Industria Naval, Marítima y Fluvial COTECMAR), was established on 21 July 2000 with founding partners Ministry of National Defence - National Navy, National University of Colombia, Colombian School of engineering Julio Garavito and Technological University Corporation of Bolivar.

This corporation helps to solve the technological needs of the Colombian Navy, relying on the relationship with the university and the company, for priority activities based on R & D, also, for the application of new technologies and best business practices in the development of its products and services, therefore, contributes to the construction of economic and social Colombia. (Arraut y Correa Z, 2012).

In Cotecmar's knowledge-based innovation management model, a fundamental element is the technological diagnosis, which establishes a categorisation of technologies according to the level of mastery, the existing gaps between current capabilities and international best practices are established, and a balance of activities is defined in order to achieve the required standards (See Fig. 1).

Figure 1. Innovation management model based on knowledge, university-company-state relations. Source (Arraut y Correa Z, 2012) translated by authors



Arraut & Correa Z (2012) explained that Cotecmar's model of innovation management based on Cotecmar's knowledge-based innovation management model allows for an appropriate relationship with

universities, research centres, technological development centres and the State, providing both scientific and knowledge capabilities and competence and the resources for the development of projects responding to the following three research programmes:

- Naval Design and Engineering: Its objective is to lead the design of ships and marine structures in Colombia, appropriating, adapting, or developing technologies in the nuclear processes related to their design, construction, maintenance, repair and scrapping.
- Materials for Shipbuilding: Its objective is to advance knowledge related to the materials used in the construction of ships and marine structures, and to optimise the processes related to their use, appropriating, adapting or developing technologies. It also integrates topics associated with the integral management of marine corrosion.
- Competitiveness: Its objective is to improve the organisational culture by increasing efficiency in the use of resources and in the implementation of new processes.

COLAF's Science, Technology and Innovation System

The Colombian Air Force established its first Science and Technology and Innovation System in 2004 through internal regulation Directive 069 of 2004, where the Structure of the Science and Technology System of the FAC was announced. This directive created the Directorate of Science and Technology, which would be responsible for providing guidelines and policies for the dependencies of the Institution and advising the high command (senior management) on issues of Science and Technology. (Fuerza Aérea Colombiana, 2004).

After the entry into force of Law 1286 of 2009, the actors of the FAC's Science and Technology System, led by the Directorate of Science and Technology, developed a process of study and analysis of the strategies to comply with the provisions of this law and as a result in 2013 the internal regulations were updated and Directive 069 was repealed and Directive 028 of 2013 was approved, where the innovation component was included and the FAC's Science and Technology Directorate was transformed into the FAC's Science, Technology and Innovation Directorate (DICTI). This new directive is also known as the Restructuring of the Science, Technology and Innovation System, where the country's universities and public and private companies became part of the FAC's Science, Technology and Innovation ecosystem. (Fuerza Aérea Colombiana, 2013).

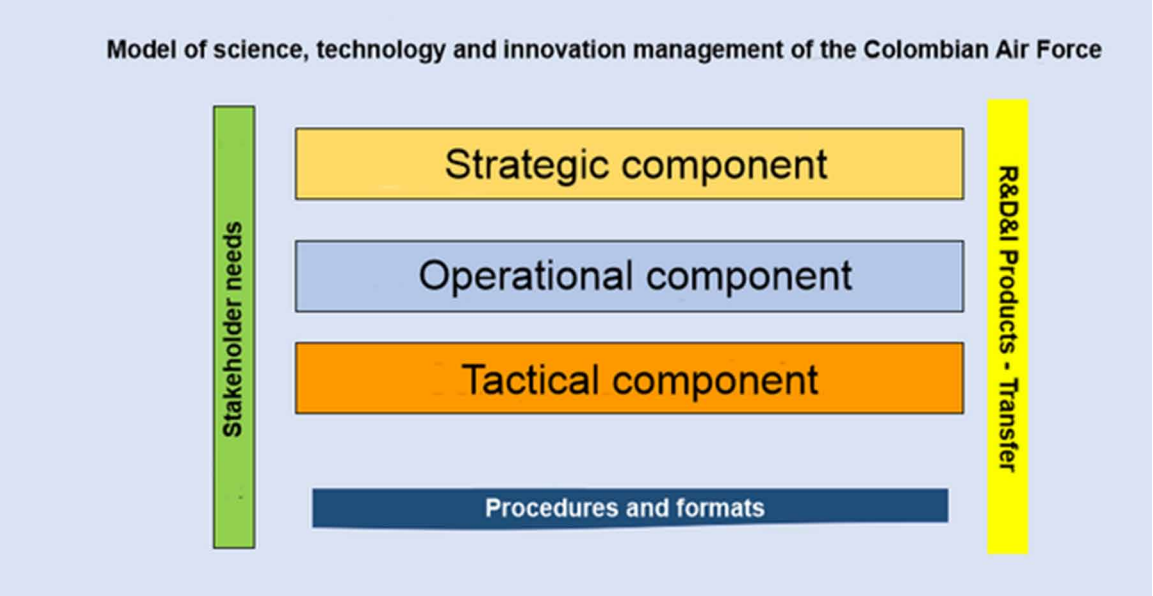
This restructuring contributed significantly to initiate an articulation with the SNCTI, and in December 2013 the first cooperation agreement for Science, Technology and Innovation Activities (STIA) was signed with COLCIENCIAS, currently, Ministry of Science, Technology and Innovation MINCIENCIAS, where efforts were joined and the joint launch of the call No 666 of 2014 was made.

The objective of this joint call was to "Support research, technological development and innovation projects that contribute to the consolidation of the four strategic programmes in Science, Technology and Innovation of the FAC". (Colciencias y Fuerza Aérea Colombiana, 2014). An especially important aspect to highlight is that it was the first time that an effective alliance was achieved with companies and universities in the country, to solve operational needs of the COLAF.

COLAF's Science, Technology and Innovation Management Model

The model designed by the FAC for the management of ST&I shows that it is an institution that is committed to the search for strategies that allow the articulation with external entities of the university and business sector, whether public or private, both nationally and internationally. The important thing is to generate new knowledge as result of these strategic alliances for the development of STIAs, which allows the country to build start-up and spin-off initiatives for the Security and Defence Sector, contributing to the strengthening of the Colombian and global economic and social fabric. Likewise, the COLAF, is consolidated as a leading contributor to the SNCTI in science, technology, innovation, knowledge, and technology transfer processes (see Fig. 2).

Figure 2. Model of management of the science and technology system of the Colombian Air Force. Source(DICTI-FAC,2015). Modified and translated by authors



The COLAF in its management model of the science, technology and innovation system integrates from the institutional strategic needs, ideas and their solution through formative and applied research, technological development, innovation (product, services and organisation), transfer, intellectual property of R&D&I products with dual characteristics (military and civilian application) to strengthen institutional capacities and benefit society.

This management is carried out through the SCTeI actors, which are described below:

FAC SCTel Actors

The ST&I actors as identified in the ST&I management model (see Fig. 2) are categorised as strategic, operational, and tactical, which are described below:

Strategic: They are in charge of defining the ST&I policy and decision-making in this field at the COLAF, defining strategic ST&I programmes, lines and sub-lines of research, as well as the articulation with external entities and the search for resources for the development of STIAs.

Operational: They are in charge of proposing the necessary strategies and controls to comply with the COLAF's policies, strategic programmes, lines and sub-lines of research and innovation, as well as advising strategic level actors on opportunities for new fields of action in R&D&I and opportunities for strategic alliances for the consolidation of strategic programmes of research and innovation and the development of STIAs. They are also responsible for directing the STIAS of tactical level actors.

Tactical: these are the actors that the COLAF's ST&I has to fulfil the programmes, lines and sub-lines of R&D&I, to solve the needs or to project the Force, they are responsible for making the task or STIA a reality, from the identification of the need, the formulation of the project, development and obtaining R&D&I products with novelty, inventive level and industrial application when appropriate or products that generate new knowledge and/or appropriation of the same.

METHODOLOGY

This research was approached from the qualitative approach, applying documentary - descriptive review, it was sought to describe the internal and external factors for the articulation of the actors of the ST&I of the COLAF, through a model of open innovation that contributes for the integration of the capacities and internal and external resources of the COLAF in the solution of needs of the institution and its allies; in the same way that allows the COLAF, to participate actively in the construction of the social and economic fabric of the Country. However, at present, open innovation is an unknown field for the COLAF since it has traditionally only used mainly a closed innovation model.

Therefore, to achieve the proposed objectives, the following variables were established as variables: open innovation, internal and external factors of open innovation, and the greatest effort was made on these variables for theoretical and documentary reviews for this study.

Likewise, to answer the research question: ¿How can the COLAF manage to articulate the actors of its Science, Technology and Innovation System to analyse the theoretical hypothesis put forward for this research? It is possible that the actors of the ST&I of the COLAF can be articulated for the development of ST&I activities. Theoretical criteria were proposed to carry out a process of bibliographic analysis in doctoral research, master's works, research articles and indexed journals.

Subsequently, after collecting the bibliographic information, we proceeded to classify and select the documents that really contributed to the analysis of open innovation, allowing the researcher to identify, categorise, conceptualise, and propose the components, principles, dimensions, internal factors, external factors and R&D&I products that would form part of the AI model adjusted to the nature and needs of the COLAF.

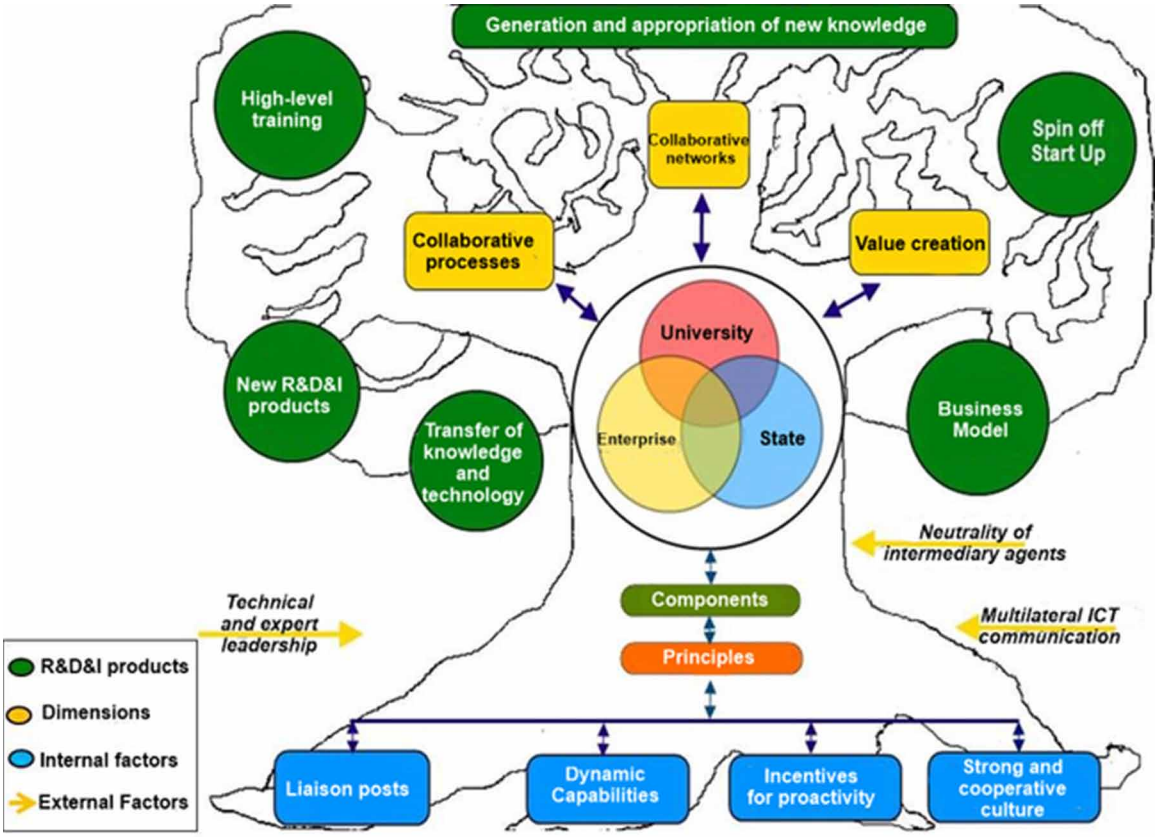
Tactical: these are the actors that the COLAF's ST&I has to fulfil the programmes, lines and sub-lines of R&D&I, to solve the needs or to project the Force, they are responsible for making the task or STIAs a reality, from the identification of the need, the formulation of the project, development and obtaining R&D&I products with novelty, inventive level and industrial application when appropriate or products that generate new knowledge and/or appropriation of the same.

RESULTS AND DISCUSSION

Open Innovation, which started its development mainly in the business sector, is based on collaboration, co-creation with different stakeholders and the commitment of an inter-organisational and synergistic effort of other organisations with similar or different missions, with mixed profit and non-profit nature in the innovative process, which allows the integration of internal and external knowledge to take advantage of both internal and external capabilities for the solution of needs. (Chesbrough, 2009).

In this chapter, a new IA model is presented, which was initially designed for the FAC (see Fig.3), because of the research carried out, however, in the future it can be adopted by different entities, organisations of the University, Business and State triad.

Figure 3. Proposed open innovation model for the FAC
Source: By Author Gerson Jaimes.



In the following, the proposed model is explained by describing the internal factors, external factors, dimensions, components, principles and products of R&D and innovation:

The internal factors proposed for this OI model (see Table 3) is:

The external factors proposed for this OI model (see Table 4) is:

Table 3. OI internal factors for the COLAF

Internal Factors	Description
Liaison Posts	The liaison posts for the COLAF would be: The area in charge of inter-institutional relations, which is responsible for drawing up agreements and conventions, and the Directorate of Science, Technology and Innovation, which is responsible for policy guidance and everything related to the management of technological innovation and research and technological development projects. Likewise, liaison posts are provided by the R&D&I centres, research groups and the COLAF's undergraduate and postgraduate training schools.
Dynamic Capabilities	Application of the FAC's knowledge management model as a basis for the creation of intelligent organisational networks.
Proactivity Incentives	Create incentives through institutional recognition (congratulations, medals) and/or a percentage of the royalties generated by commercialisation can also be granted, individually or as a group according to the nature of the development or product obtained, in accordance with the existing legal regulations for this issue.
Strong and cooperative culture	Generate a change of mentality in the ST&I actors through training and coaching for team and collaborative work, to build high-performance teams with dynamic capacities to take on the challenges posed by the COLAF's strategic ST&I programmes and constant changes in the national and international environment of the University - Company - State.

Source: By Authors.

Table 4. External factors IA for FAC

External Factors	Description
Technical and Expert Leadership	The knowledge of national and international universities, companies, Offices for the Transfer of Research Results and Technology Transfer Offices, will be used for networking, for the formulation, development, implementation, commercialisation and transfer of results, products and knowledge generated by the development of R&D&I activities.
Multilateral ICT Communication	The implementation of ICT 4.0 tools, mainly the platform of the National Academic Network of Advanced Technology (RENATA) where connectivity services, collaboration tools, voice, videoconferencing, cloud, training and project management are highlighted, which has as an added value security protocols and in compliance with the provisions of the Ministry of ICT MINTIC. However, according to the nature of the STIAs, free ICT tools with basic security levels could be used for networking with other entities of the triad university, business, state.
Neutrality of Intermediaries	Intermediate agents would be the High Technology Corporation for Defence (CODALTEC), RENATA, National and International Offices for the Transfer of Research Results and Technology Transfer Offices and the Colombian Department of Science, Technology and Innovation (COLCIENCIAS).

Source: By Authors.

For the dimensions proposed for this IA model, inputs, actions, resources, and outputs are defined, based on what was proposed and validated by (Ramírez, 2015), but adjusted to the needs of the COLAF:

1. Collaborative Processes Dimension

Collaborative processes are understood as all the actions that the participants of an open innovation project manage and/or contribute knowledge for the achievement of a common project. The activities that these participants carry out are complementary and aim at creating value (Ramírez, 2015).

Inputs to the processes:

- Governance processes: these are the ones that establish the policy, define the strategic programmes of ST&I and the convenience of carrying out collaborative open innovation projects. In this process, the strategic component of the ST&I generally acts for the COLAF, and for the allied entities, the Presidency and/or Rectory of the participating organisations, the legal secretariats, and the innovation units if they have them or areas in charge of specific projects.
- Missional processes: these are in charge of the construction of ST&I programmes, in the case of the COLAF, the operational component. Generally, in universities, these are the training, innovation, or extension units; in the other entities, they are mainly carried out by the vice-presidencies or innovation units.
- Support processes: these are the units that provide support to the entire project, in the case of the COLAF, the areas in charge of institutional logistical support and the other entities their communications, systems services and logistics departments.
- Coordinating Team: the team is appointed to follow up on the actions that are part of each particular STIA. Participantes: son los diferentes actores (personas o entidades) que se vinculan y desarrollan las STIAs con los parámetros establecidos en el modelo de innovación abierta colaborativa.

Actions of the process:

- For each project where open innovation is applied and where the triad of university, business, state and COLAF participates, several actions are required, where an agenda of times and spaces for meetings must be established, as well as the signing of agreements for the guidelines of the agreements between the institutions.
- Likewise, defining the scope of the project's objectives; the mechanisms for delivering innovation challenges; clarity in the benefits and recognitions for the participants; planning, organisation, implementation, and evaluation of the project; and project follow-up, adjustment, feedback and appropriation of the shared knowledge generated.

Resources:

The resources that are recommended to be considered for this dimension to meet the requirements of the model are proposed:

- Time of the Project Director and/or Principal Investigator.
- Knowledge of the COLAF's ST&I process.
- Knowledge of the legal offices of the COLAF, Universities and entities of the Company and the State.
- Time of the participants committed to the collaborative open innovation project.
- Needs of the COLAF, the Business Sector and the Universities.
- Spaces and protocols for meetings.
- Incentives
- Use of ICTs for interaction between participants.

- Budget investment by the entities of the triad University, Business, State for the formulation, development, implementation, and appropriation of the shared knowledge generated as a result of open innovation projects.

Outputs:

- Collaborative Open Innovation Agreements between the COLAF and its partners in the triad of University, Business, State at national and international level.
- Implementation of the Open Innovation model for the COLAF.
- Adjusted and validated Open Innovation model for the COLAF.
- Creation of a culture of open innovation in the COLAF.
- Generation of shared knowledge with the triad of University, Business, State, useful for the solution of dual needs (military and civilian) as far as possible.
- Strengthening of the University-Business-State relationship.
- Collective learning for the management of collaborative open innovation projects.

2. Collaborative Networks Dimension:

For the open innovation model of the COLAF it is proposed to use the potential offered by the networks of intelligent organisations for the conformation of successful innovation ecosystems, these networks of intelligent organisations have in their DNA, interactions that are gestated within collaborative open innovation projects and that are externalised with the use of ICT tools or developments.

For this dimension of collaborative networks of this open innovation model for the COLAF, proposed in this work, the following inputs, actions, resources and outputs are established:

Outputs:

- Willingness of the high command of the FAC and the entities of the triad University, Business, State to participate in the Open Innovation project.
- Appointment of a Coordinating Team, where a representative of each entity is appointed as spokesperson, interlocutor and responsible for the commitments acquired between the entities.

Relationship Actions:

- CV and summary of each participant, presentation to the group.
- Choose a leader to consolidate ideas.
- Network communications protocol.
- Definition of responsibilities and roles in the smart organisation network.
- Creation of a database of participants.
- Face-to-face and virtual meetings.
- Resources
- Allocation of synchronous and asynchronous times.
- Communications through the use of ICT tools and developments.

- Cloud space with computer security protocols to transparently store documents and network content.

Outputs:

- OI networking for the COLAF and its partners at national and international level.
- Database of participants.
- Dissemination of knowledge generated in the construction of networks of intelligent organisations in academic and scientific journals and digital media.
- Recruitment of new strategic allies for the network.
- Compilation of valuable information for decision-making.
- Leverage connectivity to discover talent for the COLAF and its allies.
- Means to provide solutions to the ST&I needs of the COLAF and its allies at national and international level.
- Formation of a critical mass with capacities for the creation, use and management of ICT tools and developments.

3. Creation of Value

For this OI model for the COLAF, the creation of value will be evidenced by the contribution that the entities of the triad University, Business and the State make to the solution of the needs of the COLAF and its allies at national and international level, as well as the contributions that are achieved for the growth of the military industry, the university and the business sector of the country and the world.

To create value, the following inputs, actions, resources and outputs are proposed:

Inputs:

- Conformation of triads of excellence based on intelligent organisation networks for Open Innovation for the COLAF and its allies at national and international level.
- Database of participants.
- Articles in scientific and business journals.
- Content stored in the cloud space with computer security protocols, developed by network participants.
- Open Innovation Collaborative Agreement between the COLAF and the entities of the triad University, Business and State.
- Proposal for an Open Innovation model for the COLAF.

Actions:

- Socialisation for the inclusion of new participants.
- Formal linking of strategic allies of the triad University, Business and State.
- Dissemination of the solutions received by the open innovation network formed.
- Recognition of the participants of the open innovation project.

Resources:

- Allocated budget.
- Temporary IA Committee (who evaluates the proposals, coordinated by the COLAF's ST&I Directorate).
- Media.

Outputs:

- Training of professionals aware of and interested in creating solutions to the realities and problems that affect the COLAF and its partners at national and international level.
- Generation of a community of expertise in dual solutions. (military and civilian)
- Managers of an applied training model that serves as an example for the country's educational sector related to the triad of university-business and the State.
- Recognition at national and international level for the effectiveness in the application of open innovation programmes.
- Collaborators of the COLAF and its allies of the triad University, Business, State at national and international level with a mentality open to change.
- Recognition in scientific journals and academic events of the Open Innovation model of the COLAF and its allies at national and international level.
- Development of new programmes to support the country's business growth as a result of solutions provided by the military industry with dual application.
- Creation of a culture of Open Innovation in the members of the COLAF and allied entities.
- Development of innovation, project management and corporate social responsibility competencies for the actors involved in this type of open innovation projects.
- Transfer of new technologies and knowledge to new participants in university-business-State relationship projects.
- Positioning of the country's technology transfer or research results offices as key players in the construction of the national economic and social fabric.
- Creation of spin-offs and start-ups derived from high-level innovations developed by the open innovation networks of the COLAF and its allies.
- Validation of the Open Innovation model for the COLAF and its allies at national and international level.

4. Components of the OI Model for the COLAF

To propose the components for this model, the model proposed by Ramírez (2015), was considered, but it was adjusted and adapted to COLAF's own particularities.

For this model, the processes are developed within each OI project for COLAF. Below are the suggested steps (see Table 5) to be considered, where each component contains the description of the concept.

Table 5. Proposed IA model components for the COLAF

Component	Description
Innovation challenges	The innovation challenges are determined by COLAF's CTeI programmes and COLAF's needs bank.
Internal and external knowledge	It consists of the application of knowledge of the members of the COLAF but also of the participants of the allies of the triad University, Business and State, with disciplinary knowledge in different areas of knowledge but with application to the specific R+D+i project.
Paradigm shift	For COLAF, the paradigm shift consists of changing the mental model from institutional development to a mental model of interdependent teamwork and alliances with the University-Enterprise-State triad.
Leadership	It is the perception of favourability of the chosen leader of the AI project, either from COLAF or from one of the entities of the triad of University, Business, State.
Inter-institutional and transdisciplinary teams	For this component it is recommended to use the element applied by DARPA in the USA, where temporary groups are formed at the highest level both from the COLAF and from the University and the Company, for the development of R&D&I projects in defined periods of time and not exceeding two years with a maximum of three years.
Communication	Assertive two-way communication is required between the leader of the R&D&I project under the AI modality and the project participants in order to achieve the objectives and the proposed results and outputs.
Creative solutions	These are the formulated R+D+i projects that the Temporary Open Innovation Committee of COLAF chooses for development with entities of the triad University, Business, State, because they have a solution to a need with factors of novelty, inventive level, industrial application, transform a process, service or generate new knowledge.

Source: By Author.

5. Principles of the AI Model for COLAF

Considering that COLAF is a military institution, the principles proposed for this model are based on the Colombian Air Force Air and Space Development Strategy 2042. (FAC, 2020) that are: integrity and security, but as a common language is sought with the triad University, Business, State, the principles of flexibility, agreements and recognition are included (see table 6).

6. Outputs of the OI Model for COLAF

One of the main contributions of open innovation is that it allows combining internal and external knowledge of organisations and joining efforts to understand phenomena to achieve mutual benefits, for this reason a first product or result of the future alliances derived from this model is the analysis of the national and international context in different fields of knowledge, for problem solving, evidenced through studies of the state of the art, state of the art either relying on tools such as technology watch, curves in S of technology, analysis of scientific articles and competitor intelligence.

Other products that stand out are the generation of new knowledge, appropriation of knowledge, high-level training, industrial property management of industrial designs, electronic circuits, prototypes, invention patents, utility model patents, management of patrimonial, moral and related copyrights, as well as learning and brand management.

Likewise, the transfer of knowledge and/or technology, allowing the implementation of different commercialisation strategies through licensing for the supply of knowledge or technology products, or

Table 6. Proposed OI model principles for the COLAF

Principle	Description
Integrity	"No human act is simultaneously good and bad; Therefore, the decisions and actions of COLAF members shall be transparent and demonstrate consistency, professionalism, honesty and dedication to the mission of COLAF. of COLAF shall be transparent and demonstrate coherence, professionalism, honesty and dedication to the mission entrusted to them, assuming with honour and respect the and shall assume with honour and respect the military investiture. It is the duty of the military to behave irreproachably before their own conscience and society". (FAC, 2020)
Security	All actions of the organisation's members are oriented towards the preservation of life. Organisation's members are oriented towards the preservation of life and the preservation of the resources allocated to the Institution. Resources assigned to the Institution. This implies acting with awareness of risk, taking the necessary measures to mitigate it and to mitigate it and fulfil the mission with the least possible losses. The members of the COLAF are obliged to act within the guidelines of physical and operational safety and occupational health and safety, generating a culture of care for life and protection, which allows the prevention of undesirable events and the preservation and optimal use of resources. Safety has a component of solidarity, which implies the co-responsibility that exists between two or more people who share an obligation or commitment, where each one of them takes care of their own personal care, but at the same time promotes the well-being of the other, the social group and the Institution. (FAC, 2020)
Flexibility	Facilities provided by COLAF and the entities for the formulation and development of IA projects.
Agreements	These are the documents related to alliance agreements, conventions and agreements signed between the COLAF and the entities of the triad University, Company, State. These articulation documents must contain the conditions established in international frameworks in ST&I, national legal regulations and the institutions' own guidelines on issues associated with cooperation, commitments in ST&I activities, definition of intellectual property participation, contributions in cash and in kind and everything related to potential opportunities for dissemination, knowledge transfer, technology and commercialisation.
Acknowledgement	To make public, written recognition for the participation in the OI projects, as well as for the achievements of the members and entities of the triad University, Business, State to achieve the proposed objectives and results.

Source: By Authors.

the creation of spin out, spin off or start up, or another business model, that contribute to the creation and consolidation of innovation ecosystems that contribute to the construction of the national and global social and economic fabric.

CONCLUSION

The theoretical hypothesis is accepted positively, where it is possible to articulate the actors of the ST&I of the COLAF, it was achieved through the literature review and bibliographic analysis, which resulted in a proposal for an IA model, which proposes the use of resources in human, physical and economic capital through networks, well-defined collaborative processes through the operationalisation of the model proposed in this research.

It is undoubtedly the importance of the articulation of University - Company - State to achieve competitiveness in any productive sector, including the Colombian National Defence and Security Sector. Therefore, this open innovation model proposed in this research is appropriate to articulate the ST&I of the COLAF, which will contribute significantly to the participation of the COLAF in the construction of the economic and social fabric of the country, through its integration with universities and the different national and international economic sectors.

This OI model proposed in this chapter, contributes significantly to understand the possibilities and tools offered by open innovation, for the solution of needs of organisations, regardless of their nature, you can get products and services with added value, through cooperative work and joining efforts with allies at national and international level, building bonds of trust and lasting relationships over time, in addition to contributing to the construction of the economic and social fabric worldwide.

This is because the R&D&I results obtained from the alliances will have a positive impact on the generation of knowledge for the university sector, updating or creating new curricula or programmes, as well as contributing to progress in scientific research, technological development, innovation, and enhancing the quality of professional practice projection. Similarly, it will allow the national and global productive sector to discover or create new business opportunities, re-engineer their business models to be more competitive in today's world, where leadership, competitive intelligence, the pivot of minimum viable products, prototypes and technology management are essential.

In this proposed model, COLAF's ST&I actors were described, where in COLAF's ST&I management model they are categorised as strategic, operational and tactical actors, the responsibility and scope of each category is evident, and they also have the opportunity to motivate themselves positively and assume the commitment to prepare themselves for the new challenges due to the continuous change of the national and global context.

In the internal factors proposed for the OI model for the COLAF, liaison positions, dynamic capacities, incentives for proactivity and a strong and cooperative culture were identified, with which it is hoped to achieve alliances based on trust and quality in the triads of excellence, with high-performance teams.

In this proposed OI model, it is expected that the external factors of technical-expert leadership, multilateral ICT communication and neutrality of expert agents will enable the acquisition of knowledge and development of new capabilities, by relying on the experience of universities, companies, research results transfer offices - technology transfer, national and international. The main contribution of these external entities is the reduction of gaps in knowledge and technology transfer, to ensure that the results of R&D&I are quality creative solutions, with attributes of novelty, inventive level, industrial application, new knowledge, or appropriation of the same according to the nature of the ACTI carried out.

The dimensions proposed in this OI model seek to promote collaborative processes, collaborative networks, value creation, where the triads of excellence, with the foundations of intelligent organisational networks, are pillars to achieve the construction of a sustainable social and economic fabric both nationally and globally.

With regard to the components in this proposed OI model, the challenges of innovation, internal and external knowledge, the need to change paradigms, the importance of the leadership of the AI project leader, the formation of temporary inter-institutional and transdisciplinary teams, the importance of assertive communication and how creative solutions must take into account attributes of novelty, inventive level, industrial application, transformation of processes, services, or that generate new knowledge or appropriation of the same were raised.

Another important conclusion is that when establishing alliances, it is essential to have principles that generate trust and clarity when resolving conflicts, which is why this model proposes 5 universal principles that allow a common language with the triad University - Company - State, these are integrity, security, flexibility, agreements, and recognition.

Finally, this OI model proposed for the ST&I of COLAF, is an inclusive and binding model of Colombian society with the international community, from the University, Business, State, where with the joint efforts and the best will a better present and future for present and future generations will be achieved, with respect for human dignity, the environment, and the creation of viable and sustainable innovation ecosystems. It also seeks to be validated and implemented in public or private entities, regardless of the productive sector in which they operate and whether they are national or international.

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Chapter 21
Entrepreneurial Competencies: An Indispensable Requirement for Business Success – Structural Analysis in the Higher Education Sector

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ABSTRACT

The entrepreneurial education has had a significant impact on the education system. One of the differentiating elements of business training is the approach that can be achieved through a set of effective competencies. In this work, the authors discuss the key competencies that need to be addressed in training future university professionals for business success. For this discussion, they use the structural analysis as a tool for construction and analysis. Initially, they discuss the purpose of the investigation. Then, they focus on the selection of the main entrepreneurial competencies according to literature. Finally, they structure a set of key variables that professionals should develop for business success. Experts with experience in the business and educational fields assess the degree of dependence and influence of the relevant competencies. From the results, they reveal a system of strategic entrepreneurial competencies that is consistent with the need for entrepreneurial training.

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INTRODUCTION

Studies such as the GEM – Global Entrepreneurship Monitor (Bosma & Kelley, 2019), show that middle-income countries like Colombia are consolidating policies that have favored entrepreneurship in recent years. One of the indicators established by the GEM, NECI[1], which evaluates the environment for entrepreneurship in 54 economies, places Colombia in the middle range and with a high rating in region 4.24. However, it is not clear that this environment favors the sustainable creation of endeavors. Indicators with low growth levels, such as the TEA[2] and EBO[3], are a constant in the past few years in Colombia. By the end of 2019, from the companies created during the first year, only 55% remain, while the second- and third-years report 41% and 31%, respectively. Under this panorama, authors such as Ramos, Campillo, and Gago (2010), Cárdenas and Naranjo (2018), and Primo and Turizo (2016), have inquired the relevance of the entrepreneur in the consolidation of these ventures, especially their entrepreneurial traits, knowledge, and competencies. This study identifies the substantial entrepreneurial competencies in university graduates that guarantee business success.

The Purpose of this chapter is identifying the most relevant entrepreneurial competencies to be trained in university students, in order to develop a professional who can guarantee business success, that is to say, generators of new ventures or employees who are recognized for their knowledge, skills, and business attitudes within an already constituted company.

Background

Based on the above, it is visible that many of the companies that are born in the region go bankrupt. It is not clear whether the origin of the problem is economic, related to state support, or environmental, but what is evident is that there is a high component related to the profile of the entrepreneur, where training and degree of experience play an important role in the development of the graduate's essential competencies.

The concept of "competencies" is full of academic debates because it encompasses disciplines such as education, psychology, and organizational behavior); and it is used in different fields and domains including medicine and health sciences, strategic management, and public policies, among others (Morris, Webb, Fu, & Singhal, 2013). Therefore, it has several views on its components: for some, they are skills, for others knowledge, values, attributes, behaviors, attitudes, characteristics, or several of these simultaneously; however, in consensus, they are the knowledge, skills, and attitudes that people need to have in order to successfully perform a particular activity or task (Okolie et al., 2021).

Tobón (2004, p. 10) defines competencies as complex processes that individuals put into action, performance, and creation, in order to carry out systemic activities and solve work and daily life problems, in favor of becoming successful individuals, living authentically, and contributing to human well-being, by integrating the know-how to do (applying procedures and strategies), the know-how to know (conceptualizing, interpreting, and arguing), and the know-how to be (self-motivation, initiative, values, and collaborative work with others), and taking into account the context that they can transform with intellectual autonomy, critical awareness, creativity, and spirit of challenge.

Based on studies developed by Bird (1995), and Man, Lau, and Chan (2002), Morris et al. (2013) state that competencies may be influenced by traits and cognition, but they transcend each of these in the sense that competencies represent observable and measurable knowledge, behaviors, attitudes, and skills

that are fundamental in the performance of a task and, moreover, can be learned by means of training and practice (Volery, Mueller, & von Siemens, 2015).

In light of the educational objectives, there are three types of learning: cognitive, psychomotor, and affective (Kozlinska et al., 2020); in the words of Tobón (2013): the know-how to do, the know-how to know, and the know-how to be. Aligned with this, several authors (Kozlinska et al., 2020; Lackéus, 2020; Sánchez, 2013) evaluate the effectiveness of entrepreneurial education by the knowledge, skills, and attitudes, also called competencies, necessary to successfully perform a particular activity or task, such as starting or managing a company or project of its own.

In the literature, there are studies that identify the characteristics, attributes, elements, or knowledge that an entrepreneur must have for his or her business project to last and become a sustainable company over time (Cingula, 2013; Hsu et al., 2011; Mitchelmore & Rowley, 2010; Ng & Kee, 2017; Postula & Majczyk, 2018; Santos, Barroso, & Avila, 2014; Tehseen et al., 2019); however, very few define these characteristics as entrepreneurial competencies that the individual should train in order for his or her venture to survive as a successful company.

Entrepreneurial competencies involve cognitive, attitudinal, and motivational components that are aligned with the planning and decision-making capacity (Sánchez-García & Suárez-Ortega, 2017, p. 110). The entrepreneurial competencies are the set of knowledge, skills, and attitudes that facilitate the creation and consolidation of a company, so that it is sustainable and contributes to the generation of economic, personal, and social benefits (Romero, 2011). Mitchelmore y Rowley (2010) claim that they are all the knowledge, motives, traits, self-image, social roles, and skills that are necessary to have a successful venture.

Gómez y Satizábal (2011, p. 125) remain in the same line, and define entrepreneurial competencies as "all those capabilities, skills, aptitudes, and abilities that allow the entrepreneur to perform properly when carrying out systemic activities, and in the resolution of problems that are at stake in the entrepreneurial process, integrating the know how to know, the know how to do, and the know how to be".

Entrepreneurial competencies are the set of skills, knowledge and attitudes that an aspiring entrepreneur should possess in order to succeed in a competitive, unstable, and unpredictable environment. They are the multidimensional characteristics that an entrepreneur should have so that he or she can make decisions in any circumstance (Okolie et al., 2021).

In order for companies to endure over time, they need entrepreneurs who are not only trained in business co-decisions, but also in attitudes and skills that allow them to have the capacity to face future situations and problems (Sánchez-García & Suárez-Ortega, 2017), to organize and execute actions likely to bring about those outcomes (Santos et al., 2014), to adapt to changes (Ng & Kee, 2017), to focus on innovation (Hsu et al., 2011; Mitchelmore & Rowley, 2010) and creativity (Alcaraz & Villasana, 2015), to take risks (Cingula, 2013; Hsu et al., 2011; Moriano, Trejo, & Palací, 2001), and to work as a team (Tehseen et al., 2019), among other competencies.

The first approaches to teaching entrepreneurship within courses, programs, and teaching-learning processes date back to the mid-twentieth century with the MBA at Harvard University, however, this topic has been addressed in Colombia since the last decade, demonstrating the importance of the impact of the entrepreneur in business and economic processes in the regions (Gómez & Satizábal, 2011).

Act 1014 of 2006 on the promotion of culture defines entrepreneurship and its training in Colombia, emphasizing the labor, citizenship, and business competencies within the system of formal and non-formal education and its articulation with the productive sector, and the action and thinking of the entrepreneur

for the creation of wealth not only for the company, but also for the economy, and the society (Ministry of National Education, 2006).

For its part, the Global Entrepreneurship Monitor (Coduras et al., 2010, p. 13) states that entrepreneurial education is "the discipline that encompasses knowledge and skills 'on' or 'in order for' entrepreneurship to be recognized as part of the educational programs of primary, secondary, and tertiary (higher) education in the official educational institutions of any country", and that entrepreneurial training should include the knowledge and skills that are necessary to start a business or a company.

The report (Coduras et al., 2010) mentions that although topics related to sales, financing, cash flow, recruitment, and training of human resources are important, entrepreneurial training should educate in the development of attitudes, recognition of opportunities, creativity, leadership, and confidence, since entrepreneurial education stimulates innovation and self-employment.

The European Commission (Comisión Europea/EACEA/Eurydice, 2016, p. 9) speaks of entrepreneurship as an individual's competence to transform ideas into actions, involving his or her attitudes, skills, and knowledge. The Commission states that the European Union and Member States attach increasing importance to the potential of young people to launch and develop their own businesses, with the aim of making them innovative in the areas where they live and work. For this reason, entrepreneurship education is essential not only to shape the mindset of young people, but to provide the basic skills, knowledge, and attitudes for the development of a culture of entrepreneurship.

The Global Entrepreneurship Monitor (GEM) reflects a strong correlation between entrepreneurial abilities (skills) and the total early-stage entrepreneurial activity (TEA), reflecting the importance of education in the development of entrepreneurial skills. Authors such as Henry (2020), and Debarliev et al. (2020), among others, confirm this in their research.

According to the fact that entrepreneurial competencies allow the individual to transform ideas into actions, it is strengthened that educating for entrepreneurship implies the development of a number of attitudes (knowing how to be or attitudinal dimension), skills (knowing how to do or procedural dimension), and knowledge (knowing how to know or knowledge dimension) to evaluate, generate, and sustain initiatives in the different situations that may arise throughout life, as is the case of the sustainability of a company.

Debarliev et al. (2020) argue that the formal education in entrepreneurship offers the possibility to initiate the students' interest and understanding of business, increases the ability to accurately assess opportunities, helps to focus their minds on innovation at product, service, and business levels, and develops high expectations of own results. Bird (2019) complements by stating that it helps develop self-concepts and the social roles of the entrepreneur, so, entrepreneurial skills should be a center of attention. Therefore, entrepreneurship education is considered an enabler or facilitator of business behavior and consequently, its research and promotion is important for academia and business.

Understanding that the entrepreneurial skills are linked to the growth and sustainability of companies (Cingula, 2013; Hsu et al., 2011; Ng & Kee, 2017; Ramos et al., 2010; Santos et al., 2014), a situation that has a positive effect on the performance of the company (Al Mamun et al., 2018), it is essential to train university students in entrepreneurial competencies with the purpose of turning entrepreneurial initiatives into successful companies. According to this, it is possible to find a number of studies listing the entrepreneurial skills that a future entrepreneur should have (Ibidunni, Ogundana, & Okonkwo, 2021; Ng & Kee, 2017; Postula & Majczyk, 2018; Tehseen et al., 2019).

In recent years, entrepreneurial education has had greater attention from policy makers and employers, recognizing the importance of preparing university students for the workplace (Henry, 2020). In their

research, Ferreras-García, Sales- Zaguirre, and Serradell-López (2021) find a strong relationship between professional competencies and entrepreneurial competencies, in a group of students of a specialization at Universitat Oberta de Catalunya.

Villasana, Alcaraz-Rodríguez y Alvarez (2016) argue that the probability of starting an enterprise increases when the individual has the belief that he or she possesses the knowledge and the skills to become an entrepreneur, and has access to the entrepreneurial education that facilitates the development of key business characteristics and attributes in students that are potential entrepreneurs (Morris et al., 2013).

The research by Sanchez (2013) reveals the benefits that students had after taking an entrepreneurial education program. He states that entrepreneurial training has positive and significant relationships with entrepreneurship-related competencies and intentions, and asserts that programs focused on training in entrepreneurial competencies can help with the challenges students have to face in the implementation stage of their venture, that is, training students in entrepreneurial competencies allows nascent ventures to endure and not decline before implementation, and mentions that his findings are consistent with the work by Osterbeek, Van Praag e Ljsselsten (2010), Souitaris, Zerbinati y Al-Laham (2007) y Unger et al. (2011).

Olutuase, Brijlai y Yan (2020) in line with the research by Fayolle, Gailly and Lassas – Clerc (2006) state that the education for entrepreneurship must contain five levels, one of which must include the development of competencies. Therefore, it is necessary and indispensable to identify the most important entrepreneurial competencies that should be developed in an individual in order to ensure that entrepreneurial initiatives become projects that materialize in successful companies.

Entrepreneurial Competencies for Business Success

The strong and abrupt changes in the world, not only caused by economic dynamics, globalization, and technological advances, but also due to situations that break all paradigms such as pandemics, climate change, and migration, among others, imply that the current entrepreneur must develop a series of competencies that allow him or her to open up space and achieve a competitive advantage and business success in the organization. The work of management becomes a constant decision-making on launching products, expanding markets, creating new production methods, among others, which can be faced with training in entrepreneurship skills, attitudes, and knowledge (Cingula, 2013; Ng & Kee, 2017; Postula & Majczyk, 2018).

Ng and Kee (2017) argue that for companies to survive and grow in today's interconnected and interdependent world, they must be equipped with deep capabilities in transformational leadership, technicality, entrepreneurship, and innovation in order to make quick decisions that lead to profitability, employment generation, and excellence in execution and operation.

Cingula (2013, p. 83) states that within the description of the practical knowledge necessary for business success, some personal, communication, negotiation, leadership, and sales skills need to be developed. In his research, he concludes that the skills that are necessary for successful managers are the same for contemporary entrepreneurs, in other words, there are opinions according to which both need the same knowledge, skills, and forms of behavior for business success.

On the other hand, Postula and Majczyk (2018) expose that the entrepreneurial spirit and the capitalization of opportunities, entrepreneurial characteristics, have a financial and non-financial effect within the company, and used together with effective communication, personal skills, and inductive and deductive reasoning, facilitate creativity, group management, and self-confidence to turn situations into possibilities.

Bird (1995) mentioned by Tehseen et al. (2019) defines entrepreneurial competencies as the characteristics related to traits, motivations, specific knowledge, social roles, skills, and self-image that lead to the birth, survival, and growth of new companies. Gómez and Satizábal (2011) define them as the capabilities, skills, aptitudes, and abilities that allow the entrepreneur to solve problems by integrating the know-how to do, the know-how to know, and the know-how to be, definition that is supplemented by Gómez-Nuñez (2017), who state that they are evidenced in the performance of a person as a result of a training process.

For Rosenow-Gerhard (2020) strengthening the business competencies of individuals working in a company generates an impact on society in terms of salary, health and well-being, citizen participation, job satisfaction, innovation, productivity, labor retention, among other economic and social benefits.

The different definitions of entrepreneurial competencies are directly related to the concept of competency, which states that it is a complex structure of the individual's attributes that group attitudes, knowledge, skills, and values that allow him or her to face the tasks to be performed in specific situations (Gonczi & Athanasou, 1996; Guillén-Tortajada et al., 2020; Tobón, 2006), for this particular case, the situations that arise in the business environment.

Authors like Sarasvathy (2001), Kirby (2004), Gibb (2005), Timmons and Spinelli (2007), mentioned by Gómez and Satizábal (2011, p. 126) identify eight competencies as indispensable in the entrepreneurial process: networking competency, problem-solving competency, achievement orientation, risk-taking competency, teamwork, creativity, autonomy, and initiative. Hu et al. (2011) synthesizes competencies into five: innovation orientation, risk-taking characteristics, practical guidance, interpersonal skills, and coordination capacity.

Al Mamun et al. (2018) highlight in their study the entrepreneurial competencies that entrepreneurs must have in order to succeed in business work. They emphasize commitment, which helps in planning long-term goals; conceptual, which provides intuition, innovation, and the ability to assess risks; organizational, which allows to allocate resources, be a leader, motivate, and delegate; opportunity recognition, crucial for identifying and evaluating market gaps and changes in the environment, building relationships and securing trust, communicating, negotiating, and managing conflicts; and strategic, denoting the ability to set and achieve goals, and be competitive.

Plumly et al. (2008) mentioned by Dahlstrom and Talmage (2018) show communication, creative thinking, leadership, strategic planning, and teamwork as competencies that are driving forces in business performance. Wickman (2001), mentioned by the same authors, states that industry knowledge, social skills or personal motivation are the key competencies for goal achievement.

In their research through the Delphi method and including ten experienced entrepreneurs and ten entrepreneurship teachers, Morris et al. (2013) identified, in consensus and from a list of 265 competencies, 13 specific competencies that an entrepreneur should have and that should be taken into account in entrepreneurial education in the development of competencies. These 13 competencies were: (i) Opportunity Recognition, (ii) Opportunity Assessment, (iii) Risk Management/Mitigation, iv) Transmission of a Convincing Vision, v) Tenacity/Perseverance, vi) Creative Problem Solving/Imagination, (vii) Resource Utilization, (viii) Adaptability/Flexibility, Ix) Value Creation, x) Adaptive Approach, Xi) Resilience, xii) Self-Efficiency, and Xiii) Construction and Use of Networks.

The attributes, characteristics, abilities, skills, attitudes, ranks, knowledge, among other items that an entrepreneur should possess for successful management are generally well-developed in the literature, therefore, different authors are selected, with different approaches but with a common measure: the entrepreneurial competencies for business success (Table 1). These studies identify the most representative

entrepreneurial competencies that an entrepreneur must have in order to achieve the sustainability of a company, favoring the understanding of the choice of competencies to be trained in university students.

The particularities of modern managers are accepted both in theory and in practice, and are considered typical characteristics of successful entrepreneurs. It is undeniable that the entrepreneur also performs a variety of tasks, including technical, financial, and knowledge aspects, so it is necessary to possess different competencies, including behavioral aspects, attitudes, and skills, abilities for the development of their tasks, always around making the best decisions (Cingula, 2013).

The process of choosing the 27 entrepreneurial competencies used in this study was carried out by means of a bibliometric analysis using the SCOPUS and WOS[4] databases. Initially, the main publications related to the topic of "entrepreneurial competencies" and their keywords were searched, after which the results were exported for interpretation in VOSviewer[5]. Figure 1 shows the first map demonstrating the relationship among keywords.

With these results, the words that were not part of any entrepreneurial competency were removed, and the 24 competencies that were in the first quartile of the list were taken. From the initial bibliometric analysis, which yielded the 24 most representative entrepreneurial competencies in SCOPUS and WOS articles, three new ones were added to cover the topic of sustainability as a strong trend observed in the research. As part of the validation of these competencies, we analyzed how relevant these 27 competencies are for an entrepreneur that is being trained to be successful, and each of the entrepreneurial competencies of the study were defined in view of this need (Table 2). Also, the competition and entrepreneurial competencies were defined.

Competencies: The knowledge, skills, attitudes, and characteristics that an individual must possess to perform a specific task effectively and successfully.

Entrepreneurial competencies: These are the set of competencies that allow an individual to create or transform a company to contribute to the generation of economic, social, and environmental benefits.

In order to establish the determining and influential entrepreneurial competencies that facilitate the formation of professionals (based on the previous 27 competencies), we established a systematic Structural Analysis. The intention of knowing this group of variables is to be able to understand the functioning of each of the 27 variables included in the system of entrepreneurial competencies considered for the Colombian context. This will allow to generate normative and operative products beforehand for the Higher Education sector in Colombia:

1. Generating scenarios with a long-term vision to propose Competitive Alternative Visions for the Colombian Higher Education sector.
2. Designing a Model of Entrepreneurial Competencies to promote the competitiveness of new companies and the entrepreneurial system in Colombia.
3. Developing Public Policy Guidelines in Higher Education in Colombia.
4. Formulating Education Plans with a Long-Term Vision in Colombia.
5. Adopting approaches and actions of the EESC.
6. Proposing pedagogical activities.
7. Including teacher education and training.

Table 1. Entrepreneurial competencies by author

Henry (2020), adapted from Morris et al., 2013: 1. Resource utilization 2. Self-efficacy 3. Building and using networks 4. Value creation 5. Opportunity assessment 6. Management/mitigation 7. Warrior Skills 8. Keep the focus and adapt 9. Recognition of opportunities 10. Resilience 11. Creative problem solving/imagination 12. Tenacity/perseverance 13. Conveying a compelling vision	**Ferreras-Garcia, Hernández-Lara and Serradell-López (2019):** 1. Acquisition and development of resources necessary to operate the company 2. Self-confidence 3. Ability to analyze 4. Ability to manage customers 5. Ability to motivate others individually and in groups 6. Mental capacity to coordinate activities 7. Commitment competencies 8. Creativity 9. Development of organizational management culture 10. Development of products and services suitable for the company, choosing market niche and product innovation 11. Development of the management system necessary for the long-term operation of the organization 12. Environmental scanning 13. Management experience 14. Previous experience 15. Familiarity with the industry and the market 16. Flexibility and quick adaptability to changes 17. Formulation of strategies to seize opportunities 18. Generation of ideas 19. Ability to make deals 20. Information seeking skills 21. Written communication skills 22. Oral communication skills 23. Recruitment skills 24. Delegation skills 25. Management skills 26. Leadership skills 27. Marketing skills 28. Organizational skills 29. Logical thinking skills 30. Human relations skills 31. Financial and budgeting skills 32. Industrial skills 33. Interpersonal skills 34. Business operation skills 35. Goal setting skills, ability to implement strategies (developing programs, budgets, procedures, evaluating performance) 36. Decision-making skills 37. Social skills, networking 38. Technical skills 39. Identification and definition of a viable market niche 40. Innovation 41. Results orientation 42. Previous involvement with new companies 43. Strategic thinking 44. Persistence and perseverance 45. Preparation of the business plan 46. Proactivity 47. Recognizing, visualizing, and taking advantage of opportunities 48. Problem solving 49. Risk taking
Dinning (2019): 1. Learning through experience 2. Self-awareness 3. Creativity 4. Discovering opportunities 5. Financial education 6. Ethics and sustainability 7. Motivating and persuading 8. Mobilizing others 9. Mobilizing resources 10. Planning and management 11. Risk/uncertainty/ambiguity 12. Taking the initiative 13. Working with others 14. Valuing ideas 15. Vision	**Tehseen et al. (2019):** 1. Networking Competency 2. Strategic competence 3. Ethical competence
Postula and Majczyk (2018): 1. Assuming responsibility for autonomous action and orientation towards efficiency 2. Focus on tasks 3. Self-confidence 4. Believe in yourself 5. Setting goals 6. Oral presentation skills 7. Ideas 8. Initiative 9. Motivating people to act 10. Creative thinking to develop ideas and solutions 11. Concern on impact 12. Deductive reasoning 13. Inductive reasoning to identify patterns and relationships 14. Values	**Ng and Ke (2017), adapted from Chandler and Jansen, 1992 and Kuratko, 2007:** 1. Adapting to changes 2. Commercializing ideas by turning them into innovative products and services 3. Building effective work teams 4. Generating profits 5. Managing uncertainty 6. Identifying opportunities 7. Gathering resources 8. Vision to recognize opportunities

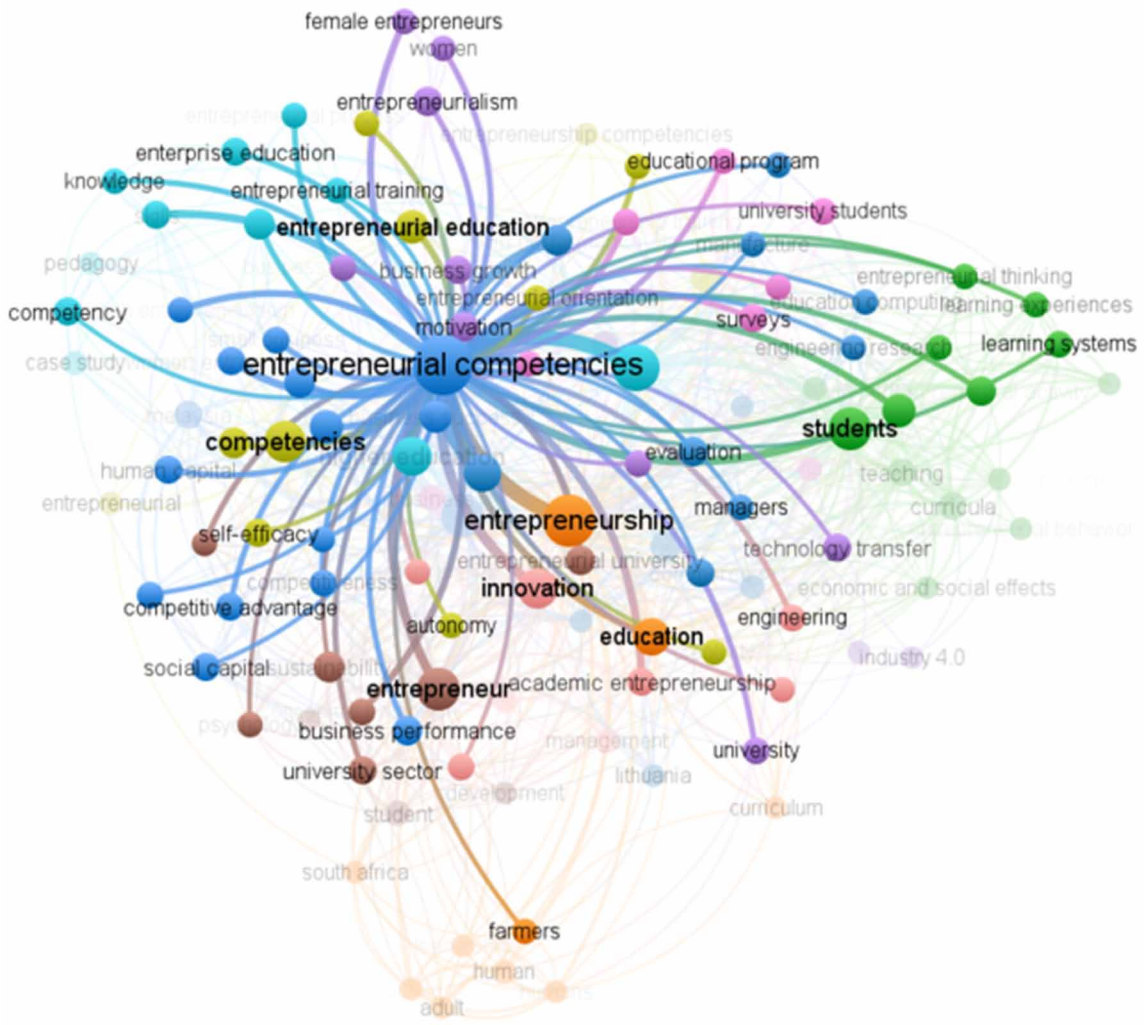
continued on following page

Table 1. Continued

Alcaraz and Villasana (2015): 1. Analysis of the Environment 2. Self-confidence 3. Ability to reflect on failure and error 4. Effective Communication 5. Creativity 6. Initiative 7. Innovation 8. Intention 9. Leadership 10. Negotiation 11. Analytical thinking 12. Perseverance 13. Planning 14. Problem solving 15. Risk tolerance	**Santos, Barroso and Avila (2014):** 1. Assertiveness and use of positional power 2. Self-confidence 3. Self-control 4. Search for information 5. Interpersonal understanding 6. Organizational commitment 7. Organizational awareness 8. Development of others 9. Relationship building 10. Flexibility 11. Impact and influence 12. Initiative 13. Team leadership 14. Orientation to achievement 15. Customer service orientation 16. Analytical thinking 17. Conceptual thinking 18. Expertise 19. Concern for order, quality, and accuracy 20. Cooperative work and teamwork
Cingula (2013): 1. Adaptability 2. Ability to network and make contacts 3. Ability to multi-task 4. Ability to work under pressure 5. Ability to work as part of a team and independently 6. Ability to research effectively (e.g. available markets, suppliers, customers, and competitors) 7. Ability to plan, coordinate, and organize effectively 8. Being able to assume responsibility and make decisions 9. Competitiveness 10. Willingness to take risks (or at least not risk aversion) 11. Financial education 12. Communication skills (e.g. the ability to sell ideas and persuade others) 13. Management skills: the ability to manage time and people successfully (both yourself and others) 14. Innovative and creative 15. Motivated and disciplined 16. Perseverance	**Hsu et al. (2011):** 1. Taking advantage of opportunities 2. Coordination capacity 3. Relational capital 4. Risk-taking features 5. Orientation to innovation 6. Proactive orientation
Gómez and Satizábal (2011), adapted from Sarasvathy, 2001; Kirby, 2004; Gibb, 2005; Timmons and Spinelli, 2007: 1. Autonomy 2. Competence to assume risks 3. Networking competence 4. Problem-solving competence 5. Creativity 6. Initiative 7. Orientation to achievement 8. Teamwork	**Mitchelmore and Rowley (2010):** 1. Acquisition and development of the necessary resources to operate the company 2. Environmental analysis 3. Analytical capacity 4. Mental capacity to coordinate activities 5. Conceptual competencies 6. Commitment competencies 7. Development of appropriate service products by choosing and innovating products 8. Development of the management system necessary for the long-term operation of the organization 9. The development of organizational culture in its management is necessary to guide the company 10. Management style 11. Management experience 12. Previous experience 13. Familiarity with the market 14. Familiarity with the industry 15. Formulating strategies to seize opportunities 16. Generating ideas 17. Written communication skills 18. Oral communication skills 19. Recruitment skills 20. Delegation skills 21. Management skills 22. Industry skills 23. Leadership skills 24. Marketing skills 25. Organizational skills 26. Logical thinking skills 27. Human relations skills 28. Financial and budgeting skills 29. Interpersonal skills 30. Business operational skills 31. Objective setting skills 32. Business skills 33. Decision-making skills 34. Technical skills 35. Identification and definition of a viable niche market 36. Ability to manage customers 37. The ability to implement strategies (developing programs, budgets, procedures, and evaluating performance) 38. Ability to motivate others individually and in groups 39. Previous participation in start-up companies 40. Business plan preparation 41. Recognition and visualization of opportunities

Source: Prepared by the authors based on theoretical references.

Figure 1. Keyword map
Source: VOSviewer with SCOPUS and WOS data.



Methodology

The Structural Analysis method was used through the construction of a double-entry matrix to capture the degree of direct and potential influence among the variables (all 27) considered in the study system.

The exercise is a qualitative process with the participation of "opinion experts" to assess the degree of influence existing in the interrelationships among variables (the 27 entrepreneurial competencies). The Structural Analysis and interpretation of the existing interrelationship made it possible to determine the variables (entrepreneurial competencies) that are considered strategic for the success of both business and the Colombian Higher Education sector.

The purpose of applying the Structural Analysis was to capture the behavior of the variables within their own functional system, that is, to determine what variables turn out to be both influential and governable, and what variables (competencies) turn out to be a desirable effect for the company; and to

Table 2. List of variables (most relevant entrepreneurial competencies) and definitions

Entrepreneurial competencies	Definitions
Adaptability to change (V1)	Ability to quickly identify, understand, and act on changes in the organization's environment, both internal and external.
Strategic vision (V2)	Ability to visualize and drive the company or the area in charge as a comprehensive system, to achieve objectives and goals.
Continuous learning of the industry and the market (V3)	Ability to understand the needs of customers and consumers, both domestic and international.
Mastery of technical issues (V4)	Ability to possess, keep updated, and demonstrate all the knowledge and/or specific experience required for the exercise of the position.
Continuous learning about products (V5)	Ability to know the products and/or services of the organization and evaluate the feasibility of adapting them to the requirements, preferences, and needs of customers.
Productivity (V6)	Ability to set high performance goals and achieve them successfully, on time and with the required qualities.
Orientation to quality results (V7)	Ability to guide one's own and/or others' behaviors towards achieving or exceeding expected results.
Planning and Organizational Capacity (V8)	Ability to effectively determine goals and priorities of their task, area, or project, and specify the stages, actions, timeframes, and resources required to achieve the objectives.
Integrity (V9)	Ability to behave in accordance with moral values, good customs, and professional practices, acting with confidence and congruence between what they say and what they do.
Toughness and dynamism (V10)	Ability to act with serenity, determination, firmness, enthusiasm, and perseverance in order to achieve challenging objectives.
People management (V11)	Ability to distribute tasks and delegate authority to a group of collaborators.
Management and achievement of objectives (V12)	Ability to mobilize organizational resources, control management, and integrate activities to achieve effectiveness, efficiency, and quality in the fulfillment of the mission.
Leadership (V13)	Ability to develop the talent and potential of their people, motivating, stimulating, and inspiring their collaborators, in order to allow them to make their best contributions.
Strategic thinking (V14)	Ability to establish the short-, medium-, and long-term impact of environmental changes in the organization.
Public relations (V15)	Ability to establish networking relationships with individuals and organizations that allow him or her to influence the social, economic, and political referents of the community.
Teamwork (V16)	Ability to collaborate with others, be part of a group, and work with other areas of the organization in order to achieve the strategy collectively.
Internal and external customer orientation (V17)	Ability to have a permanent vocation to serve internal and external customers, to understand their demands, and to generate effective solutions to their needs.
Effective communication (V18)	Ability to listen and understand the other in order to transmit the information that is required in a clear and timely manner, in pursuance of achieving organizational objectives.
Decision-making (V19)	Ability to analyze various variants or options, considering the existing circumstances, the resources that are available, and their impact on the business, and then select the most appropriate alternative.
Innovation and creativity (V20)	Ability to devise new and different solutions aimed at solving problems or situations, in order to add value to the organization.
Initiative – autonomy (V21)	Ability to act proactively and think about future actions for the purpose of creating opportunities or avoiding problems that are not evident to others.
Adaptability – flexibility (V22)	Ability to work effectively in varied and/or unusual situations, with diverse individuals or groups.
Perseverance in achieving objectives (V23)	Ability to act firmly and consistently in the execution of projects and in the achievement of objectives.
Economic sustainability (V24)	Ability to apply methods to maintain the company under favorable financial conditions for a given period.
Social sustainability (V25)	Ability to develop activities for the benefit of the internal and external community of influence of the organization.
Environmental sustainability (V26)	Ability to organize and carry out environmental education, conservation, or restoration activities.
Risk-taking (V27)	Ability to accept risks, mitigate the impact, and assume the responsibility that this brings.

Source: Prepared by the authors based on theoretical references.

Table 3. Characteristics of the experts

Characteristics	Percentage
Years of experience	10 years on average as an entrepreneur (President / General Manager / Owner)
	7 years on average as a college teacher
Basic academic training Undergraduate	23.1% Engineering and related professions 76.9% Professionals in administration, science, and related
Men Women	61.5% Men 39.5% Women
Lead role	53.8% Entrepreneurs 46.2% Teachers
Localization approach given to the experts	Colombia and most important cities

Source: Prepared by the authors based on the experts' resume.

identify the very decisive but not governable variables, and those that were harmless within the system for the achievement of the sustainable competitiveness of the company in the Colombian context (captured from the subjectivity and cognitive exercise of the opinion experts involved).

This was possible by means of the Orthodox interpretation of the Cartesian Plane that the Structural Analysis generates as a final result – called the "Plane of Indirect and Potential Influences/Dependencies", which shows the location of each variable by the logic of the system of coordinates that the values of the axes of the aforementioned plane established: the degree of Influence (y- axis) and Dependency (x-axis) (Gándara & Osorio, 2014; Singh & Gupta, 2020).

The method seeks to find the main influential and dependent variables and thus, the variables that are essential to the evolution of the system. The different phases of the method are as follows: list of variables, description of relationships between variables, and identification of key variables.

Phase 1: List of Variables

The twenty-four entrepreneurial competencies yielded in the initial analysis, plus the three to cover the topic of sustainability, were listed and identified by numbering them from V1 to V27. These competencies, referenced by different authors who have been recognized in SCOPUS and WOS for their work, were treated without any bias or prior assessment parameter, since groups or typologies were found but not taken into account in this study, so that none of them had influence over the others, guaranteeing their independence.

Phase 2: Description of Relationships Between Variables

It should be noted that a questionnaire was designed for the classification of the variable system, and for the basic format of "Double Input Matrix" not to be used, as according to Gándara and Osorio (2014), the matrix format generates unintentional errors in the exercise of evaluation due to visual saturation in the case of using many variables, as is this case.

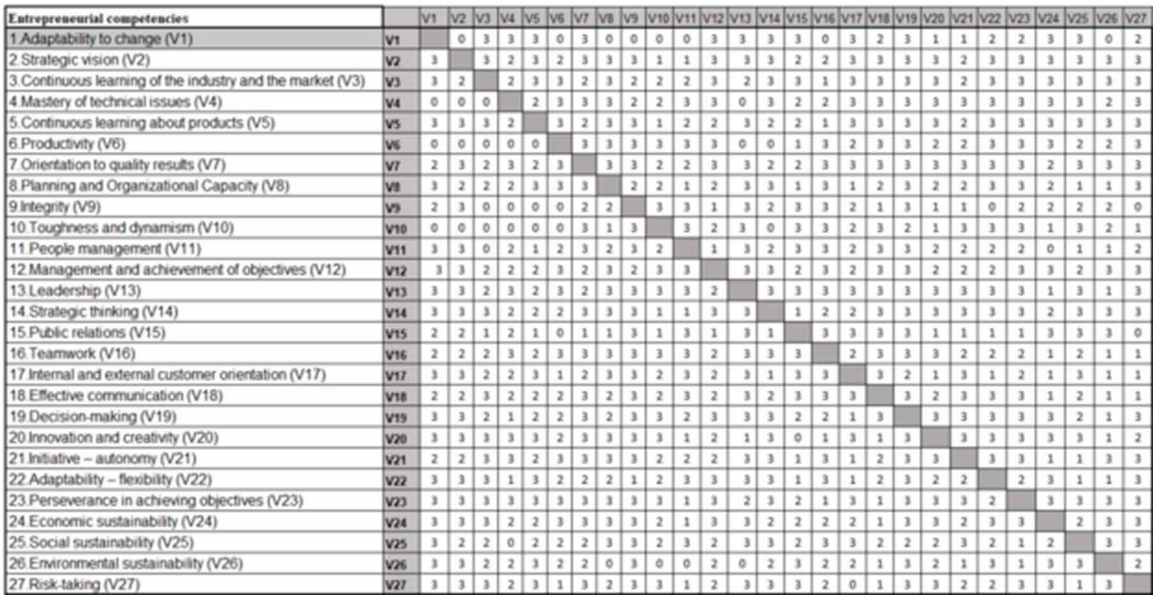
The questionnaire was designed based on the structural analysis model in which a single core question was asked: What is the Degree of Influence of Variable X on Variables... N? and in this format,

Figure 2. Front page of the data collection form
Source. Authors from many google pages

together with the question, the definition of the independent variable was included, as well as the other variables in the body of the questionnaire (also with their definition) so that they could be evaluated.

The Degree of Influence assessment was carried out with a Likert scale of 0 to 3, where 0 means no influence, 1 weak influence, 2 moderate influence, and 3 strong influences. The questionnaire was

Figure 3. Data capture matrix
Source: Prepared by the authors



Entrepreneurial competencies		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27
1.Adaptability to change (V1)	V1		0	3	3	3	0	3	0	0	0	0	3	3	3	3	0	3	2	3	1	1	2	2	3	3	0	2
2.Strategic vision (V2)	V2	3		3	2	3	2	3	3	3	1	1	3	3	3	2	2	3	3	3	3	2	3	3	3	3	3	3
3.Continuous learning of the industry and the market (V3)	V3	3	2		2	3	3	2	3	2	2	2	3	2	3	3	1	3	3	3	3	2	3	3	3	3	3	3
4.Mastery of technical issues (V4)	V4	0	0	0		2	3	3	3	2	2	3	3	0	3	2	2	3	3	3	3	3	3	3	3	3	2	3
5.Continuous learning about products (V5)	V5	3	3	3	2		3	2	3	3	1	2	2	3	2	2	1	3	3	3	3	2	3	3	3	3	3	3
6.Productivity (V6)	V6	0	0	0	0	0		3	3	3	3	3	3	0	0	1	3	2	3	3	2	2	3	3	3	2	2	3
7.Orientation to quality results (V7)	V7	2	3	2	3	2	3		3	3	2	2	3	3	2	2	3	3	3	3	3	3	3	3	3	2	3	3
8.Planning and Organizational Capacity (V8)	V8	3	2	2	2	3	3	3		2	2	1	2	3	3	1	3	1	2	3	2	2	3	3	2	1	1	3
9.Integrity (V9)	V9	2	3	0	0	0	0	2	2		3	3	1	3	2	3	3	2	1	3	1	1	0	2	2	2	2	0
10.Toughness and dynamism (V10)	V10	0	0	0	0	0	0	3	1	3		3	2	3	0	3	3	2	3	2	1	3	3	3	1	3	2	1
11.People management (V11)	V11	3	3	0	2	1	2	3	2	3	2		1	3	2	3	3	2	3	3	2	2	2	2	0	1	1	2
12.Management and achievement of objectives (V12)	V12	3	3	2	2	2	3	2	3	2	3	3		3	3	2	3	2	3	3	2	2	2	3	3	2	3	3
13.Leadership (V13)	V13	3	3	2	3	2	3	2	3	3	3	3	2		3	3	3	3	3	3	3	3	3	3	1	3	1	3
14.Strategic thinking (V14)	V14	3	3	3	2	2	2	3	3	3	1	1	3	3		1	2	2	3	3	3	3	3	3	2	3	3	3
15.Public relations (V15)	V15	2	2	1	2	1	0	1	1	3	1	3	1	3	1		3	3	3	3	1	1	1	1	3	3	3	0
16.Teamwork (V16)	V16	2	2	2	3	2	3	3	3	3	3	3	2	3	3	3		2	3	3	3	2	2	2	1	2	1	1
17.Internal and external customer orientation (V17)	V17	3	3	2	2	3	1	2	3	3	2	3	2	3	1	3	3		3	2	1	3	1	2	1	3	1	1
18.Effective communication (V18)	V18	2	2	3	2	2	2	3	2	3	2	3	2	3	2	3	3	3		3	2	3	3	3	1	2	1	1
19.Decision-making (V19)	V19	3	3	2	1	2	2	3	2	3	3	2	3	3	3	2	2	1	3		3	3	3	3	3	2	1	3
20.Innovation and creativity (V20)	V20	3	3	3	3	3	2	3	3	3	3	1	2	1	3	0	1	3	1	3		3	3	3	3	3	1	2
21.Initiative – autonomy (V21)	V21	2	2	3	3	2	3	3	3	3	2	2	2	3	3	1	3	1	2	3	3		3	3	1	1	3	3
22.Adaptability – flexibility (V22)	V22	3	3	3	1	3	2	2	2	1	2	3	3	3	3	1	3	1	2	3	2	2		2	3	1	1	3
23.Perseverance in achieving objectives (V23)	V23	3	3	3	3	3	3	3	3	3	3	1	3	2	3	2	1	3	1	3	3	3	2		3	3	3	3
24.Economic sustainability (V24)	V24	3	3	3	2	2	3	3	3	3	2	1	3	3	2	2	2	2	1	3	3	2	3	3		2	3	3
25.Social sustainability (V25)	V25	3	2	2	0	2	2	2	3	3	2	3	2	3	3	2	3	3	2	2	2	3	2	1	2		3	3
26.Environmental sustainability (V26)	V26	3	3	2	2	3	2	2	0	3	0	0	2	0	2	3	2	2	1	3	2	1	3	1	3	3		2
27.Risk-taking (V27)	V27	3	3	3	2	3	1	3	2	3	3	1	2	3	3	3	2	0	1	3	3	2	2	3	3	1	3	

Table 4. First data

Indicator	Value
Matrix size	27
Number of zeros	46- 6,5%
Number of ones	129 -18,3%
Number of twos	227- 32,2%
Number of threes	303 -43,0%
Number of P	0
Total	788
Fillrate[7]	90,4%

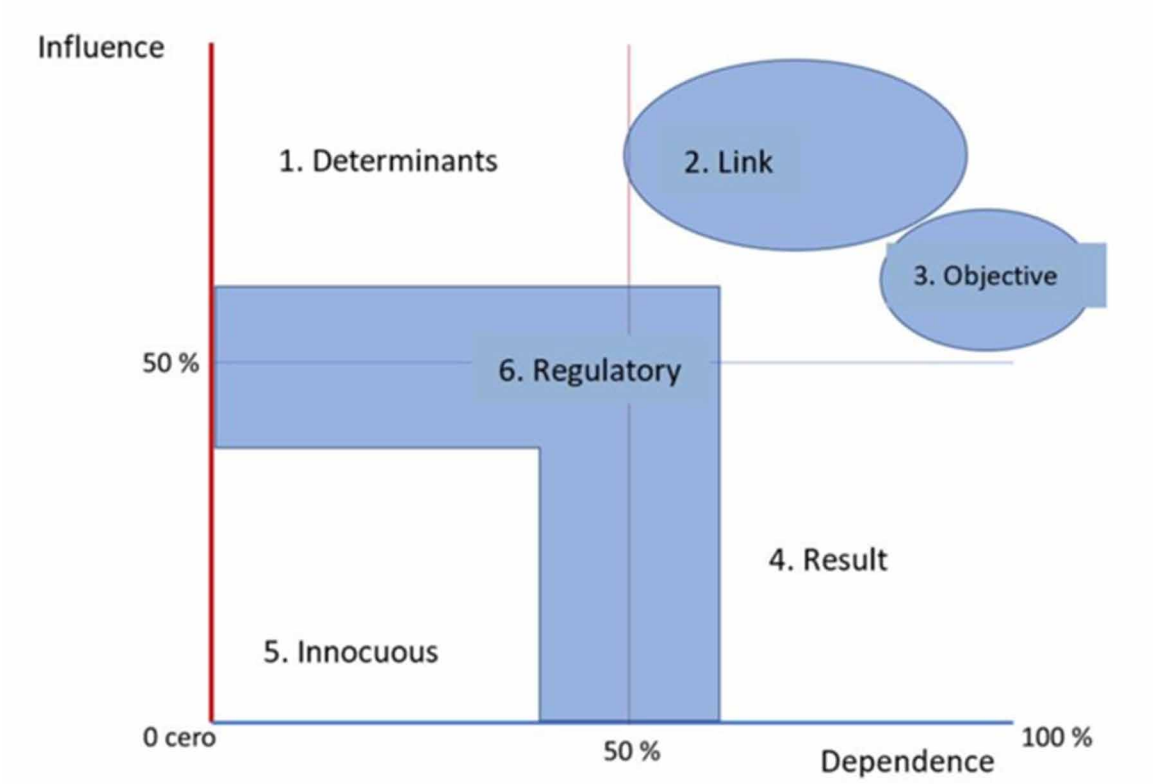
Source: Prepared by the authors based on the experts' resume.

Table 5. Stability of the matrix iteration process

Iteration	Influence	Dependence
1	99%	103%
2	99%	97%
3	101%	100%
4	100%	100%

Source: Prepared by the authors based on Lipsor's MICMAC program

Figure 4. Cartesian plane areas
Source: Prepared by the authors



applied to all experts by means of a technology platform, after a virtual meeting for the explanation of the instrument and its objective.

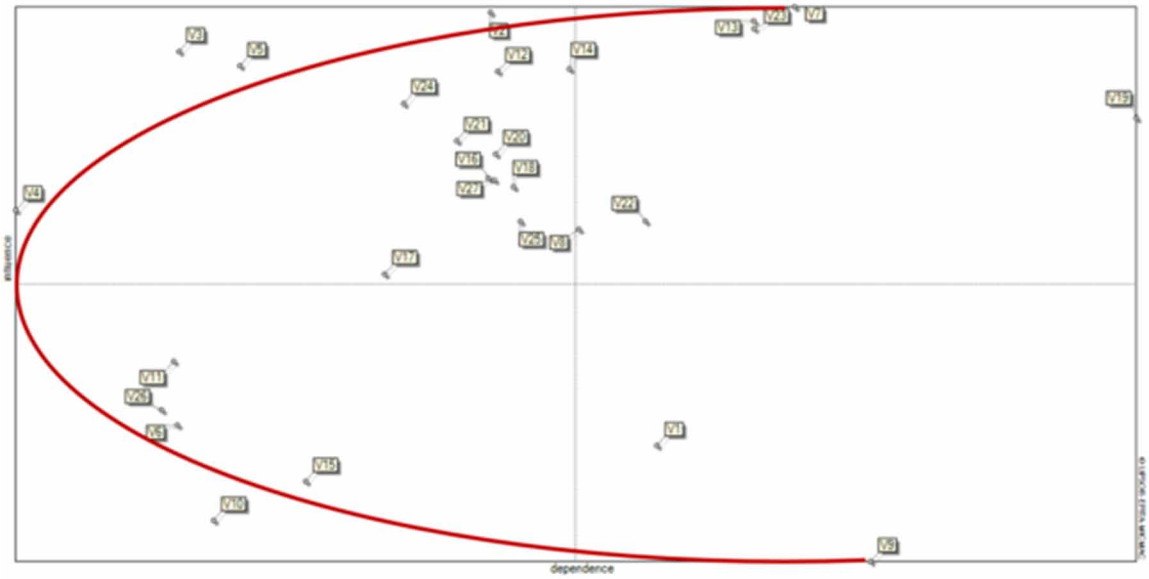
The Structural Analysis is supported by the expert method, as the importance of the opinion of people with extensive experience facilitates for the data obtained to be reliable and consistent with the local empirical reality (Bastarrica & Romero-Lamorú, 2014; Fernández et al., 2018). The formation of the group of 16 experts who participated in the research is shown in Table 3.

The study involved two different samples of experts, one panel composed of distinguished Colombian entrepreneurs and the other composed of leading entrepreneurship educators in universities in Colombia. The opinion experts were selected from an independent research group. Experts from the two groups were invited to participate in the study by email during the first half of 2021. Two inquiry sessions were held with each expert: the first one was an exploratory and explanatory video conference, and the second one a confirmatory and/or data collection session.

Phase 3: Identification of Key Competencies

Each expert rated the degree of influence that each variable had on the others over a period of one week. For this purpose, we used a presentation in order to give context and explain to the experts participating

Figure 5. "Potential indirect influence/dependence map"
Source: Prepared by the authors with MICMAC data from Lipsor



in the exercise, also to give them access to the questionnaire located in Google Drive Forms[6]. Figure 2 presents the front page.

For practical purposes, Figure 3 is shown below in the original format of the Structural Analysis method, which consists of the so-called Double Entry Matrix and the consolidated scores obtained by the group of 16 experts who, once again, evaluated the degree of prevalent influence among the variables of the system under study (entrepreneurial competencies).

The values captured in this matrix turn out to be the value of the statistical mode (most repeated value in the sample) in order to capture the consensus of the general criterion of the participants in an indirect way.

The scale that was used is shown below:

Influences range from 0 to 3, with the possibility of identifying potential influences:

0: No influence

1: Weak influence

2: Moderate influence

3: Strong influence

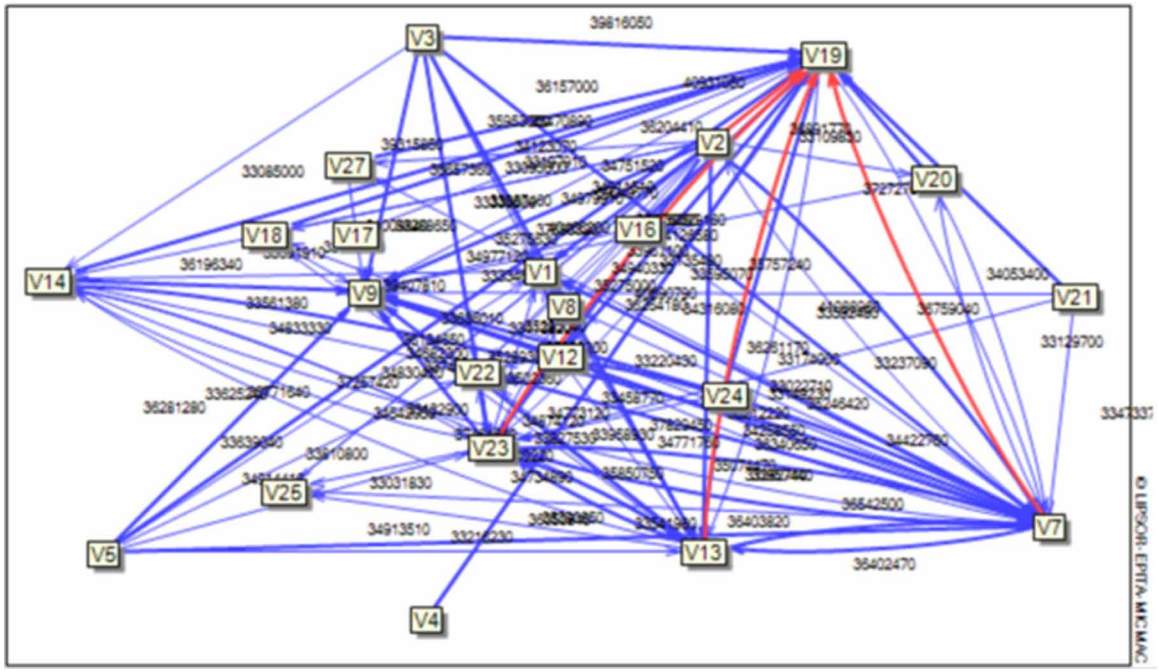
P (3): Potential influences (No used in this research) but considering the same value range

The first results were initially processed in a spreadsheet to debug errors and parameterize the responses under the mode value criterion, as mentioned above. It should be noted that this helped to remove two of the questionnaires, as there was little variability and high recurrence in the response (bias).

So, the summary and characterization of the captured data is shown in Table 4:

Given that any matrix must converge to stability at the end of a certain number of iterations determined by the number of variables it contains, the MICMAC program that was used indicated that it was necessary to use four iterations to achieve stability (Table 5). Stability should be understood as the point

Figure 6. Potential indirect influence map at 15% of the total
Source: Prepared by the authors with MICMAC data from Lipsor



at which the process ensures that it has achieved the total number of multiplications among all possible combinations of interaction of the variables and denote total balance.

Table 6. Strategic variables

Strategic Variables	Regulatory Variables	Results Variables	Objective Variables
V2-Strategic Vision	V8 - Planning and organizational capacity V25 - Social Sustainability V18 - Effective communication V17 - Internal and external customer orientation	V1-Adaptability to change V9 - Integrity	V 19 – Decision-making
V14-Strategic Thinking			
V12- Management and achievement of objectives			
V27- Risk-taking			
V16- Teamwork			
V7- Orientation to quality results			
V23- Perseverance in achieving objectives			
V13- Leadership			

RESULTS

To describe the results, Figure 4 presents an interpretation of the Final Cartesian Plane called "Influence Plane/Indirect and Potential Dependencies" which indicates the final positioning arrangement of the 27 variables considered in the analysis.

The importance of interpreting the plane that was obtained goes beyond the simple description of the evident arrangement of the variables according to their coordinates, given by the value of influence and dependence obtained with the qualification of the Direct Influences Matrix; which obeyed the initial value of the qualifications collected and synthesized with the value of the statistical mode. Rather, it is a matter of giving a coherent explanation of the role that variables play in the system under study.

Figure 4 of the plane identifies six functional areas that account for the role that the variables have depending on their location. In this sense and in order of importance for their mention, it indicates that the variables (2. Linking variables) are the ones that are unquestionably assumed as Strategic in the system due to their effective degree of influence on the variables (3. Objective variables) and (4. Results variables), which reveal the ultimate effect sought with the interaction of entrepreneurial competencies to achieve the sustainable competitiveness of the companies. Secondly, the variables (6. Regulatory variables) should be observed, some of which are susceptible to be subscribed within the strategic group since, due to their moderate degree of influence and dependence, they are precursors and establish the adequate conditions for the objective and result variables to be expressed.

In the third instance, we must observe the variables (1. Determining variables) as they have a strong influence on the system, and their very low dependency value allows to cause a change effect on them; but it is worth noting in any case that their influence is not only strong but harmful to the system.

Finally, the variables (5. Harmless variables) are observed, which, given their low degree of influence and dependence, are useless for inducing changes and the desired results in the system under study.

The resulting plane is shown in Figure 5.

As shown in figure 4, the variables are displayed under a distribution along the Y- axis= Influence and the X- axis= Dependency denoted by the red arc. This means that it is a relatively stable study system, as the variables: (1. Determining variables) and (5. Harmless variables) can hardly be affected by the effect of other variables in the system.

In practical terms, it means that such stability reflects a significant resulting consensus among experts regarding the dominant role of variables type (1. Determining variables), which are difficult to influence, and with those of type (5. Harmless variables), which are not useful for generating any change.

This makes it possible to highlight that the variables of type (2. Linking variables) and (6. Regulatory variables) are the ones that generate a beneficial climate to promote the creation or transformation of a company. This leads to promote sustainable competitiveness in its three main aspects: economic, social, and environmental.

Figure 6 shows the graphic image of the interactions in the system that is being analyzed, including influence levels: Very strong, strong, and moderate. In this general plane, it is possible to observe the variables that impact the variables of Objective Type, Results Type, and those that remain as Regulatory type.

Table 6 presents the Strategic Variables that influence the Results and Objective Variables. In addition, with the help of Regulatory Variables, they generate an effective business climate for companies.

In order to complete the interpretation of the Structural Analysis, the Determining and Harmless Variables were identified.

The Variables that resulted as Determining Variables and that, due to their nature, have a positive impact on the entrepreneurial competencies system are the following:

V3 - Continuous learning of the industry and the market
V5 - Continuous learning about products
V4 - Mastery of technical issues

The Harmless Variables of the system are:

V10 - Toughness and dynamism
V15 - Public Relations
V6 - Productivity
V26 - Environmental sustainability
V11 - People management

These results are consistent with those found in the research by Kozlinska (2020) regarding the forms of employment status; with the intention to develop entrepreneurial competencies as a goal by Kaartemo (2018); and whit the problem solving proposed by Morris et al., (2013).

SOLUTIONS AND RECOMMENDATIONS

Based on the results of the MICMAC matrix, the discussion of the entrepreneurial competencies that guarantee business success focuses on three clearly defined aspects.

The entrepreneurial competencies that the experts highlighted the most, are based on the knowledge of the operational structure of the company and how it develops in a market context. The idea of continuous or lifelong learning is supported as a competency that must be continuously and autonomously pursued.

The entrepreneurial competencies of the area determining the environment can be classified into three groups related to strategy and that are part of the higher order competencies. The soft skills, which refer to the personal characteristics and competencies that show how a person gets along with the other actors in the entrepreneurial system; one group of social skills or interpersonal skills; and as a last group, the competencies that guarantee the maintenance and sustainability of the company at the technical, economic, and social levels.

FUTURE RESEARCH DIRECTIONS

The future of research focuses on how these competencies, which are key to business success, are linked and developed in teaching-learning processes. These processes include pedagogical and didactic methodologies, learning methods, the influence of the teacher and his environment, and in particular the process of evaluation of competencies.

The great advantage of the preliminary results of this study is that, from a broad group of entrepreneurial competencies, the experts focused on 15 of them, and these in turn, are strongly related.

Although a major trend in the development of entrepreneurial competencies is sustainability (economic, social, and environmental), this analysis shows that the three pillars have not yet been concentrated on the area of the system determinants, only two are located in system regulators, leaving environmental sustainability relegated.

CONCLUSION

The incorporation of bibliometric analysis tools accompanied by prospective tools supported by experts in the training area, are instruments to facilitate the analysis, providing a greater scope, and allowing in this case, to organize and propose other forms of diagnosis and evaluation of how competencies support training in entrepreneurship.

The results found in the first instance reinforce the hypotheses of some authors such as Sánchez-García (2017), Mitchelmore and Rowley (2010), and Cingula (2013) where the development of competencies is applied in order to generate knowledge, skills, and attitudes that help the future entrepreneur to make concrete and accurate decisions, very consistent with the results of the Structural Analysis and the map of entrepreneurial competencies.

The search for professionals with perfected entrepreneurial skills has become a recurring activity for companies seeking to develop their organizations (Rosenow-Gerhard, 2020) or for professionals who decide to start their own business. This has been demonstrated with the generation of the dependency influence map, where the key entrepreneurial competencies, considered as strategic variables, should be the focus for any training or transformation process, generating the dynamics that strive for the development of this type of professionals.

As a result of the aforementioned application, the Structural Analysis allowed the prioritization and identification within the system of each of the entrepreneurial competencies whose criticality or potential allow to prioritize decisions and actions for business success; and on which an educational institution or organization could concentrate its training efforts.

In this sense, middle and higher education programs should be oriented towards generating a normative-strategic thinking that will allow graduates to have a perspective of transcendence (normative) and of relation with their environment (strategic). This ensures that future business leaders or business-entrepreneurs have an assertive notion of the direction they want to follow (vision) and what goals should be established within the criteria of feasibility, relevance, and plausibility, in order to shape the general strategies that the company should undertake to ensure its sustainability and competitiveness in its environment.

Finally, it is very revealing that those related to the "operational perspective" of a company also stand out within the package of Strategic Variables (key business competencies), pointing towards the management and achievement of objectives, the ability to take risks, and the promotion of positive leadership that encourages teamwork oriented towards the achievement of results with added value for the company.

In the particular case of the model of entrepreneurial competencies for business success, the most important components of competency are: continuous learning of the product-service strategy, the development of soft competencies, and business sustainability.

Lastly, a special aspect is the low valuation of personal competencies such as the integrality of the professional, and those related to personality within the scope of the company's decision-making process that could be thought to be the key to public relations correlated with productivity and the environment,

but what the results showed is that, as variables within the system, they indicated a very low influence on the system of entrepreneurial competencies.

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KEY TERMS AND DEFINITIONS

Competency: The knowledge, skills, attitudes, and characteristics that the individual must possess in order to effectively and successfully perform a specific task.

Entrepreneurial Competencies: Those qualities that a person must have to initiate and lead changes in his or her professional or personal environment. They are mainly composed of three aspects: Knowledge (knowing), Skills (knowing how to do), and Attitudes (willingness to do).

GEM: The Global Entrepreneurship Monitor is the most prestigious and extensive study on the state of entrepreneurship worldwide.

MICMAC: Cross-Impact Matrix Multiplication Applied to a Classification, a method developed by M. Godet in collaboration with J.C. Duperrin.

PEI: General statement that concretizes the mission, and links it to the institutional development plan; that is, it sets out the fundamental plans of institutional action through which the mission is carried out and gives meaning to short-, medium-, and long-term planning.

Structural Analysis: Methodology that offers the possibility of describing a system by using a matrix that interconnects all the components that are involved in a system. This method makes it possible to study these dependency and influence relationships, and to identify essential variables.

ENDNOTES

1 National Entrepreneurship Context Index – NECI.
2 Total early-stage Entrepreneurial Activity (TEA) - (up to 3.5 years).
3 Established Business Ownership (EBO).
4 WEB OF SCIENCE.
5 VOSviewer software to build and visualize bibliometric networks.
6 A Google Drive form is a digital document that is used to create surveys, ask questions or collect information online, and to later collect, store, and process the data and responses obtained.
7 Rate of filling calculated as a ratio between the number of MDI (Matrix of direct influences) values different from 0 and the total number of elements of the matrix.

Chapter 22
Creating Synergic Entrepreneurship as Support of Sustainability: Opportunities and Challenges

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ABSTRACT

Going beyond adapting to the changing world in the globalization environment or finding new solutions for different needs is only possible with a broad perspective. This perspective requires strategically selecting the team members while understanding the principles of an effective team and using a participatory approach, culture, and synergy to guide the team to achieve exponential results. Therefore, entrepreneurs try to seize opportunities and achieve sustainable success by creating a culture that feeds on differences in realizing the business idea. From this point of view, synergistic entrepreneurship, which is one of the types of entrepreneurship that is open to new perspectives and learns from differences, is mentioned. Also, the contribution of a continuous development approach to achieve high performance with innovative solutions is discussed in this chapter of the book.

INTRODUCTION

Entrepreneurs who bring together the factors of production may prefer to be proactive or reactive while making their dreams come true in all business processes. Many factors such as sectoral structure, business area, the effect of technology, rate of change, access to resources, and infrastructure are effective in making this decision (Manwaring et al., 2021). The reason why this decision is important for the entrepreneur is that it makes a basic positioning in adapting to the environment. Since this perspective will be the main starting point while dealing with the new problems created by the changing environment, the targets and corporate strategies, that is, the whole future of the enterprise will be shaped according

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to this situation. The recent pandemic not only made technology a necessarily new way of working but also demonstrated the importance of global distribution and accessibility. Therefore, adaptation to change sometimes ceases to be a matter of preference and becomes a necessity (Ince, 2021b). Although there are positions that vary according to the sector and the scope of the business, the adaptation to the environment and the interaction with the technology of all initiatives with sustainability targets will continue to be critical decision factors (Purbasari et al., 2021). One of the approaches to dealing with these factors is synergistic entrepreneurship based on taking innovative steps by learning from differences.

The subject is of great importance as it synergistically approaches the sustainability required to cope with disruptive situations in institutional environments. It also draws attention to the issues of seeing differences as a tool of innovation and creativity, learning, and using knowledge in determining future strategies. The entrepreneur's ability to make a difference by focusing on the main business field is possible by getting rid of activities with low marginal benefit compared to the time taken. Therefore, partnerships, agreements, or various collaborations that consider such businesses as their main field of activity will provide a competitive advantage. From this point of view, this chapter focuses on thinking globally from a broad perspective and discusses a situation in which the entrepreneur who brought the business idea to life continues to manage the business in later periods. The main aim of the chapter is to draw attention to the concept of synergetic entrepreneurship and secondly to highlight the contribution of a synergistic approach to sustainability. Such perspectives, in which the strength obtained from the partnership is more than the sum of individuals, are worthy approaches that value the employee, partners, society, and customers, in short, human.

Innovative approaches, that seen as one of the useful methods of coping with environmental change, are possible with minds that can think differently, so it is necessary to know how to learn and to be open to new ideas. Because of the rapid acceleration of digitalization, it cannot be sufficient for the entrepreneur to do everything right in situations in global competition, and it is necessary to adopt approaches that can manage change by going beyond the standards. While focusing on core activities that can create value, it is possible to adapt to the changing nature of the ecosystem and become permanent with the learning organization structure open to innovation (Ince, 2020). The success of partnership or diversification strategies with the support of structures that value humans within the enterprise will also increase.

EXECUTIVE ENTREPRENEUR

The introduction of the concept of entrepreneurship, which plays a key role in economic development and social development, is very important to first raise awareness and then to guide people with entrepreneurial intent. Raising the awareness of individuals who want to establish a new business or offer a new or different product to the market due to pushing and attractive factors such as personal and financial goals will firstly benefit individually and then at a macro level.

Entrepreneurship can be defined as the process of creating something new with a value that will bring monetary or personal satisfaction and independence as a result of the activities by spending the necessary time and money, undertaking the financial, psychological, and social risks it brings. This explanation is the expanded version of the entrepreneurship definition made as a whole formed by the organization, actions, and new results created by the entrepreneur (Light, 2021). From another point of view, it is a social process that takes place through individuals or teams that gather resources to capture market opportunities (Ireland et al., 2003). To mention one more last definition, entrepreneurship is "the process

of establishing an organization by carrying out creative activities with resources such as personal energy, vision, passion, commitment and motivation" (Timmons & Spinelli, 2008).

Although entrepreneurship is a concept that can be defined in different ways if it is necessary to reveal a general definition from the definitions made as bringing together production factors such as labor and capital to meet the needs and to produce creative and innovative solutions by taking risks while doing this. Continuing to manage the business by the entrepreneur is also considered as a manager-entrepreneur or an executıve-entrepreneur. The effect of entrepreneurship defined in this way on the changes and developments experienced in the modern world will be discussed in this title.

Changing Nature of Entrepreneurship

Changing human needs, technology and digitalization show their effects in the concept of entrepreneurship as well as other factors. In some cases, entrepreneurs trigger the change in these issues. Therefore, this mutual relationship between the external environment and entrepreneurship causes the formation of new entrepreneurship types and the development of different perspectives. The types of enterprises that emerged because of this diversity are classified differently according to the ownership or nature of the business established, as well as with different names according to the type of ownership. Some of the concepts that concern this section can be listed as follows (McCarthy & Leavy, 1999):

- According to the nature of the job: Entrepreneurship with available resources or creative entrepreneurship.
- According to the innovation dimension: Imitative entrepreneurship or innovative entrepreneurship.
- According to the strategy: Innovative creative entrepreneurship, strategic entrepreneurship or follower entrepreneurship.

Considering the classifications made, it is seen that types of entrepreneurship are qualified under different names according to the perspective of the entrepreneur. These classifications can be further increased due to the other related factors. The entrepreneur can act proactively or reactively, depending on the position taken in seizing opportunities in the future or proceed on the way alone or with a partner. These approaches, which are adopted to ensure sustainability, can yield successful results especially in investments in foreign countries. Some types of initiatives that are determinant in the entrepreneur's business ownership at various levels can be listed as follows (Corbetta et al., 2004; Elfring, 2005):

- Team entrepreneurship: As the name suggests, it is a type of entrepreneurship established by an expert team to realize a specific goal or project, where the risk is undertaken by this team and decisions are made jointly. The team can also select a manager among them to manage current affairs.
- Corporate entrepreneurship: In this type of entrepreneurship, where entrepreneurship is transformed from an individual to corporate, proactive approaches are preferred to survive in a strong competitive environment. It is carried out through strategies such as innovation in the processes of an enterprise, cooperation or joint venture with other businesses, and gaining competitive advantage through resource consolidation.
- Joint venture and partnership: An initiative that two or more legal entities come together to implement a certain investment project they have agreed upon, also known as a "JV". However, what

distinguishes this type of initiative from others is that they come together not only for a project but also to establish and maintain a business.

- Executive-entrepreneur: Since establishing the business and sustainably conducting the established business are two different business areas, it often causes discussion of the difference between the manager and the entrepreneur. However, after the entrepreneur who successfully brought together the production factors, taking part in the execution of the business means that he also took over the management. For this reason, it is possible to see business models that are both entrepreneurs and managers. Although getting professional executive support is often recommended, the entrepreneurs' desire to be in charge of their own business is understandable.

Infopreneur, a combination of knowledge and entrepreneurship known as Converting Data into Dollars, is one of the types of entrepreneurship that started before the era of digital celebrities and demonstrated the impact of technology on entrepreneurship (Weitzen, 1989). As can be seen, the sustainability of the current business may require practices such as various partnerships or working in teams. In such cases, the aim of the entrepreneur to use scarce resources in maximum efficiency creates the result of creating value with synergy. Hovewer, Agarwal (2004) defines five types of entrepreneurs according to the new venture strategy as follows:

- Opportunistic type, driven by expectations of financial gain.
- Push type, driven by negative "push" reasons for starting a business.
- Managerial type, who have high leadership, administration, and environmental skills, as well as a desire for financial returns.
- New craftsman type, with a high need for autonomy at work and desire to pursue a product or service idea.
- Idea-driven opportunist type, which emerged as a "mixed" type.

Although the concepts change, it is striking that there are common points that are emphasized. Therefore, different classifications make it easier to deal with the issue from a broader perspective. Moreover, this last classification draws attention to the attractive and repulsive factors that affect the entrepreneurial environment. It is that the negative conditions faced by the person lead to establishing a new business. Some of these reasons that differ according to the individual are organizational reasons such as unhappiness in the workplace, problems with colleagues-managers or subordinates, negative business atmosphere, and lack of promotion opportunities (Bögenhold & Staber, 1991). Conversely, attractive factors are the reasons that make entrepreneurship desirable. Independent decision-making includes such factors as obtaining personal income, achieving determined goals, and providing a social benefit by using other personal potentials.

To understand the change in entrepreneurship, it is necessary to focus on the concepts of experience and learning. Increasing knowledge provides the development of new methods and contributes to the formation of new perspectives. Therefore, in the process from the idea developed by the entrepreneur to the realization of this idea, the sharing, evaluation, and transformation of information into experience is not only a personal but a synergistic process. According to Gemmell et al. (2012), developing entrepreneurial ideas can be linked to experiential learning in the entrepreneurship process. In their study with thirty-two technology entrepreneurs, they determined that this process has eight stages, three of which are individual and the other stages are group-related:

- Realization of the problem: The first idea that the entrepreneur starts to think is the stage of noting it or thinking about its likelihood. At this stage, the entrepreneur is still individual and evaluates the problem or idea based on personal abilities.
- Waiting stage: During this stage, which lasts for 4 or 5 months, the entrepreneur has started to create a to-do list and starts talking to people about the business idea but does not directly convey the main opinion, the process is still individual.
- Conceive: When thinking personally about the idea, it is the moment when the flashes go off and the solution that is nowhere or no one sees occurs. In this exciting phase, entrepreneurs are now ready to open their ideas to others.
- In-group social experience: First, close groups are presented with a great idea that is noticed, and the audience is excited when they are told how to make money from this idea.
- Social experience with the close external group: After that, two companies to be partnered with are interviewed within 48 hours and an appointment is made as soon as possible since there are also competitors.
- Social experience with other close external groups: As a result of the arranged meeting, information about new companies and vendors is obtained and other groups are stepped in with the cooperation provided here.
- Social experience with the distant outer group: Companies that are thought to be helpful or add value to the business idea are interviewed and successful results are tried to be achieved. However, if the expected cooperation is not achieved, different alternatives are tried.
- Active experience: As a result of unsuccessful interviews, before making the final touches on the business idea, a website is opened to understand the products that attract the industry. By tracking who viewed which products for five or six weeks, the idea is further developed according to the market.

As a result of the research, it was revealed that entrepreneurs who established a technology company use an eight-stage enterprise process. Although there are differences in the entrepreneurial process according to the selected sector and target audience, the process that starts with the discovery, sharing, and exploration of the potential of the idea, in general, is completed with the action. Handling entrepreneurship in this way is very successful in terms of clearly seeing in which processes the entrepreneur needs aesthetics. Thus, even if a person wants to own a business alone, it is seen that in the entrepreneurial process, the environment and opportunities offered by the ecosystem will affect personal ideas. Therefore, when the subject is handled from a broad perspective, it draws attention that the opportunities available to the entrepreneur are at least as important as other environmental factors. From this point on, new and different perspectives will be mentioned in the next title. In this way, it is thought that the foundations and necessity of synergetic entrepreneurship will be revealed.

New Approaches in Entrepreneurship

The changing face of competition pushes entrepreneurs to think big and comprehensive, in some situations while sometimes they need to consider small and local dynamics. While global strategic partnerships are seen as one of the requirements of the digitalizing world, non-location virtual organization structures require new business processes (Ince, 2021a). The digitalization of trade and the fact that this

change takes more and more shares in the market makes distribution companies even more important and reveals timely access to the consumer as a global problem.

While there are entrepreneurs who look at all these new investment ideas in terms of serial entrepreneurship, some investmenets as high research and development (R&D), communication or space are required teamwork consisting of expert groups. The entrepreneurial intention and business establishment perspective show themselves in all structures such as the culture of the business, the organizational structure, and the way of working in the following processes (Glukhikh & Golovina, 2021). While this interaction between technology, environment, and strategy shows different effects in sectors that do routine business, it can be different in sectors that are not routine and open to change. Therefore, the working style of an automotive company and the working style of advertising or informatics companies that require an adhocracy approach will be different. To understand the relationship between all these structural elements and the entrepreneur, first, it is necessary to go to the basis of the process. The most fundamental is the entrepreneur's access to resources and the degree of scarcity of resources.

Factors such as efficient use of scarce resources, changing consumer needs, and digitalization are some of the elements that the entrepreneur cannot ignore in their investment decision. The importance of scarce resources has a direct impact on the entrepreneur's level of autonomy and the intensity of control. Therefore, the situation of the factors of the production market can influence the venture decisions. The pressure of the sector on these resources determines the internal relations, intensity, and conflict level (Pla-Barber et al., 2021). When all these factors are taken into account at the same time, the position of the enterprise can change according to the nature of scarce resources and the dependence of the sector on these resources. Since securing inputs is a vital issue, the necessity of locating the initiative according to the source will arise and collaborations will be gathered based on this basic point.

In areas where environmental change is relatively rapid, power relations and adaptation to change can become even more of a priority. Relations with the institutional, political and economic environment may force the entrepreneur to be flexible according to the density of the sector, the supply of resources, and the division rate of this supply. It is only possible with organic or flexible structures that all internal processes, from management style to business structure, can be free from rigidity or inertia. While the pressure of scarce resources on all businesses in the sector forces entrepreneurs to isomorphism, which is the aim of gaining legitimacy by moving away from passivity will trigger different actions (Bhattarai et al., 2021). The pressure of adaptation or removing forces the entrepreneur to think systematically and synergistically.

In other words, the entrepreneur's adaptation or reaction to change can be considered as a kind of entrepreneurial mindset. Perspectives on change, the environment, and entrepreneurial activities affect the decision to retain or transfer the venture for a long time as well as the use of resources and adaptation behaviors. The difference between those who look at their business as a family and those who consider starting a new business as pleasure is discussed in the concept of serial entrepreneurship. Serial entrepreneurship and portfolio entrepreneurship are compared in a classification made according to the behavior of entrepreneurs, in terms of using and evaluating resources while adapting to the external environment. This distinction is also made in parallel entrepreneurship and serial entrepreneurship (Westhead & Wright, 1998). The basic starting point of these classifications is the behavior of the entrepreneur. There are alternatives in terms of ownership between setting up multiple businesses and being dealing with one continuous business (Wright, Robbie & Ennew, 1997):

- Serial MBO / MBI: There is a change of ownership in multiple ventures and the investments are with existing ventures.
- Serial start-up: There is a change of ownership in multiple initiatives and the investments are with new ventures.
- Multiple-corporate entrepreneurship: There is no change of ownership in multiple ventures and the investments are with existing ventures.
- Portfolio entrepreneurship: There is no change of ownership in multiple ventures and the investments with new ventures.

In this classification, four different alternatives are depending on the ownership status and the result of undertaking a new investment. The serial MBO (Management Buy-Out), or MBI (Management Buy In) in the first box of the matrix is about outsourcing or procuring the necessary management team for new investment. The serial start-up in the second box means new initiatives where ownership is transferred with new investments. In the third box below, multiple-corporate entrepreneurship is included and the situation of diversifying the existing company without changing the business ownership is explained. The aim here is to continue loyalty by acting through the only existing business. In portfolio entrepreneurship in the last box, new investments are made without changing the ownership status. The field of the business is expanded with various initiatives and all these developments continue with the ownership of the founding entrepreneur.

The ownership status of the entrepreneur and the continuity of this situation also vary depending on the ecosystem the business is in. Because ecosystems that provide access to resources are among the best examples of environmental synergy creation. One of the main reasons is that the region exhibits a structure that triggers innovation and commercialization, facilitating new initiatives through social networks and angel investors. These types of initiatives feed on the ecosystem in which they are located, while also making unique contributions that create value in return. Thus, it contributes to the increase of total earnings and regional development by helping other businesses in the local ecosystem. The key elements that make this type of entrepreneurship feasible and deemed important for success are listed as follows (Ensign & Farlow, 2016):

- A supportive ecosystem,
- Good teamwork,
- Strategic focus,
- Exchange ideas by presenting new opinions,
- Enjoying the work processes.

These elements, which serial entrepreneurs see as very important, show that the ecosystem is at least as important as personal characteristics. When they look back, it is thought that entrepreneurs who provide job satisfaction by considering how successful they are, generally approach events with an optimistic, energetic, and passionate perspective. Because starting a new business is a passion of serial entrepreneurs and they evaluate their success motive in this direction. This way of addressing value creation can be seen as one of the results of approaching the development process of the enterprise differently.

Social networks constitute one of the most valuable elements in reaching a qualified workforce and other resources in the enterprise process. In some cases, understanding local variables can become as valuable as knowing global factors (Sarasvathy et al., 2013). It is precisely for this reason that con-

sultancy firms that meet this need have emerged. Some local connections can be made through these companies. Especially if there is a risk situation, a tool that moderates the environment may be more useful. However, if it is possible, the entrepreneur may want to evaluate personal possibilities in order not to create a new cost item. Social networks are one of the critical elements affecting establishment and development in serial entrepreneurship as in every type of entrepreneurship. Another situation that is as important as getting to know the current market or the market that is about to be entered is to be able to recognize and adapt to the social values that the business will be in (Presutti et al., 2008). This variable, which can be considered as an element of the entrepreneurship ecosystem, may come across as one of the problems that the entrepreneurs must deal with on their own if there is no suitable ecosystem. For this reason, the society in which the target audience is a part should be considered as important as other social stakeholders.

In some cases, it is more attractive to go after new and different jobs by transferring the responsibility to someone else when the jobs are in a certain order, rather than working with a lifetime employment policy for the success of a single enterprise. This perspective can be seen as very useful in terms of increasing the number of new and successful entrepreneurs and leaving footprints that show the success path for the next ones in the ecosystem. However, business transfers made before they are ready, especially in sectors where change is fast, may put the continuity of previous enterprises at risk. Supporting serial entrepreneurship with appropriate ecosystems will strengthen its positive aspects as a type of entrepreneurship, which has a very important contribution in terms of widespread entrepreneurship and the motivation of future generations. The best suggestion is to take appropriate legal and socio-economic conditions as well as individual incentives. Because the entrepreneur will be able to activate the harbor of ideas to the extent that he can reach the resources.

Simple ideas can be the smallest elements of important future-oriented developments. The economic and social reflections of the added value obtained make the subject very valuable. Entrepreneurship is one of the concepts that is highly regarded in the economies of the country, therefore it is addressed with various features in terms of both internal and external factors, namely many elements that affect success and performance. Similarly, it is not enough to establish only one business; sustainability is also emphasized to create added value. For this reason, it is not only the individual entrepreneur but also the decision centers that direct the country's policy to support serial startups by creating appropriate ecosystems. Because the success of the individual affects the society and then the country and even directs global trends. After these explanations about entrepreneurship, it is beneficial to mention the concept of synergy in terms of creating sustainable value.

SYNERGY

The concept of synergy, which describes the achievement of more than individual performance because of the common mind obtained from togetherness, is an issue that can be addressed in a multidimensional way. This issue, which can be handled both inside and outside the enterprise under the participatory management approach that values people includes the reflection of external stakeholders or social responsibility groups in the decisions of the entrepreneur. Therefore, the concept will be discussed in terms of sustainability, and the internal and external synergy of the entrepreneur will be mentioned in this title.

The Scope of Synergy

The basic meaning of the synergy about the achieving by the combination of two or more units has more effect than the sum of their efforts. It means that the effect of two or more people in daily life is more than the sum of the effects that the individuals will achieve alone. (Goold & Campbell, 1998). The concept mathematically expressed as "one plus one equals three" or "two plus two equals five" is exemplified as a handful of matchsticks being stronger than a matchstick and not being broken. The concept of synergy emphasizes the strength arising from the union, such as the forest producing more oxygen than a single tree. It is about the achievement of an above-average performance as a result of the harmony between the sub-elements of the system that constitutes it (Holtström & Anderson, 2021). Synergy, which is the key to being creative and innovative for the entrepreneur, is seen as one of the requirements of being sustainable as a result of the exchange of ideas with others, strategic partnership, resource sharing, vertical harmony, and collective bargaining power.

Zhao (2005) emphasized that opportunistic and innovative businesses affect each other positively and when these two concepts come together, organizational wealth emerges. While these two elements are the main keys to entrepreneurial success, they are also determinants of the entrepreneur's sustainability in a dynamic and changing environment. In addition to starting a new venture, it is necessary to encourage such behaviors in organizational culture and management style to benefit from the synergy that enables the entrepreneur to benefit from dynamic and holistic processes in breakthroughs of an existing enterprise. Since the entrepreneurial thinking structure, which also includes a strategic perspective, requires considering the variables that should not be confused with each other as well as the integrated elements, it will emerge as a result of the blending of analytical thinking and creativity. In some situations, the entrepreneurial way of thinking should create the synergy of different perspectives such as rationality, realism, and imagination (Dhliwayo & Van-Vuuren, 2007). Because synergy contains elements that make it easier to find new solutions when conditions change.

Bolton and Thompson (2013) explain the synergy that the entrepreneur will create with the environment, resources, and values with the combination of these, and emphasize the position to be formed by the intersection of these factors, the ability to change, and the opportunity to see discount. This means ensuring that the entrepreneur can use the resources effectively, by adapting to the external environment. In this process, in addition to recognizing the opportunities that arise with the combination of environment and values, it is also necessary to use the ability to change by combining resources and values and to be determined in this regard. Only in this way can a strategic position be taken according to the environment and resources and the activity can be started. The progress of entrepreneurial activities depending on the interaction of variables while passing through all these processes shows the importance of understanding the relationship between environment, resources, and values. Therefore, the supports that enable them to understand these variables and to use them for their interests as much as possible will be very useful in terms of synergy.

Satisfying social and individual needs requires a harmonized perspective and directs the entrepreneur to the creation of complex structures where different needs can be met, which can be named as an inter-institutional synergy or a corporate synergy system (CSS). Isaak (2009) emphasizes that this is especially true for initiatives that require synergetic competition networks such as Silicon Valley where high-tech productions are made. Cooperation between institutions is provided with the help of open synergic networks (networks) based on trust, and a chance to compete in the global economy is obtained by creating synergetic zones to benefit from the other advantages of coexistence. Synergetic

networks offer entrepreneurs the opportunity to develop, creativity, and learning, on the one hand, and realize their high-tech business ideas on the other. Chiu et al. (1999) mention that the synergy used for cleaner production (CP) brings different sizes of businesses together. According to the authors, a CSS established between firms in supply chains usually consists of a central firm and its satellite production suppliers. Thus, this synergy-creating system can be adopted as a key mechanism to encourage cleaner production (CP) in small and medium-sized enterprises. So, it can be said that the innovative ecosystem created by synergy provides intellectual and economic contributions, maintaining a collective learning culture. Following this title, in which synergy is discussed in terms of entrepreneurs, it is beneficial to scrutinize the issue of synergy between institutions.

Network Synergy

Trusting the employee and giving a certain amount of responsibility is one of the indispensable elements of continuous improvement by providing synergy. The entrepreneur's ability to carry out joint activities with external stakeholders or new companies within the scope of various agreements also depends on the success of its employees. For this reason, building high-performance teams is a natural outcome of human relations-oriented approaches that allow them to be confident in the employees, to participate in decisions. In this respect, teams can be handled with the following classification (Glassop, 2002):

- Task teams,
- Department development teams,
- Process development teams,
- Quality circles or quality improvement team.

While task teams consisting of experienced members are on the job when urgent solutions are required in a short time, the process development teams make the decisions that affect the long-term operation of the enterprise, which is at a medium level in terms of time pressure and urgency. With short meetings, the department development teams consisting of department staff (Dimitriades, 2000) solve the middle-level urgent problems of the department. Finally, the processes in which the applications are controlled with a certain guide are considered as a quality circle. The basic principle of all these practices is to provide a continuity that will create synergy.

When the issue is handled in terms of the relationship of the entrepreneur with the external environment, it is necessary to look from a wider perspective. The synergy that an entrepreneur can provide with other businesses is only possible with a good position in terms of social networks. The concept of social networks emphasizes the necessity of obtaining the critical resources for innovation from corporate collaborations instead of a single enterprise (Zhao, 2005). This point of view offers the business the opportunity to benefit from all of its components, including the processes, technologies, market outputs, and distribution channels of others. Because when the capital, capabilities, and other resources of a business are limited, more power can be obtained from the association. Collaborations with close allies or loyal competitors also ensure that the risk is shared.

Network communication, which is an outcome of the open innovation approach, makes many technologies possible, from space traveling to smart robots, and can ensure that the whole world is involved in a major project. Even if not on a large scale, there are also network innovation types that create a secondary market and offer alternative customers, company content, working style, and capacity through

dealerships. Network innovation should not be confused with internal networks or information networks. Because the network structure includes partnerships, consortia, and other mergers as well as external relations. To distinguish network innovation from other implementations, the following questions can be asked (Keeley et al., 2015):

- Does the business work with other firms or unexpected partners to develop proposals that will change the ordinary business order?
- Conversely, does the business lend its channels, processes, brands, or other unique tools to other players and evaluate their offers?
- Does the business meet with its suppliers or customers to develop, test or market new products?

Depending on the answers and their importance in the business, the network structure of the business can be obtained. Good relations with all parties belonging to the near and distant environment such as consumers, suppliers, financial institutions, universities, and trade associations will provide information and resources for innovations, as well as adaptation to the changing environment and process development. Similar to the knowledge perspective of the resource-based approach, organizational learning sees adaptation to the external environment and removing learning barriers as a powerful competitive tool (Arndt & Sternberg, 2000). Gathering external information for the business will help discover new applications to use and make radical innovations.

The high degree of network development creates synergy for innovative activities and makes the innovation process more open and suitable for information flow. The network structure applied to obtain the power arising from the association can be in two different forms. The value chain formed because of collaborations with consumers and suppliers is called vertical connection, while collaborations with competitors, research institutes, universities, or public institutions are called horizontal connections. Both types of networks have their benefits. Vertical connections provide low cost, risk-sharing, and time savings, while the focus is on new product projects. In horizontal connections, complementary information is provided and the pioneering advantage of R&D activities is utilized. After mentioning network synergy that results in a more favorable structural position for the combined firm as the acquirer gains control of the target's existing ties, it is worth addressing the innovation-based learning process to adapt to change.

INNOVATION AND CHANGE

Innovation, one of the most important elements of entrepreneurship, means not only developing new products and opening new markets but also transferring the discovered products or processes to new areas of use. The concept of the term is carried out in different ways as it feeds on innovation and creativity. The process of advancing a business idea towards innovation can occur gradually with the knowledge or with a sudden change. For this reason, there are different names and types according to the field, method, and level of innovation. The entrepreneur's perspective towards innovation can be defensive, traditional, and aggressive by the basic strategy of the enterprise, as well as a tool for differentiation and being an industry leader. The progress of innovation, which is a product of effective teamwork that will be achieved by the combination of different talents, will vary according to the strategic point of view (Aghion & Tirole, 1994). While a business that embraces open innovation adopts dynamic models that

are open to external information exchange, more closed businesses will attach importance to internal cycles such as the black-box model.

If the opportunity of the new idea can be utilized, it is further developed and commercialized. Otherwise, not every idea will be commercially successful. It is very important to determine the needs in the stage of developing a new business idea that requires a creative and innovative perspective. Efforts to eliminate a detected need or a perceived deficiency are considered as innovation only if they reach the consumer. Well, the first answer to the question of what innovation is not and with which concepts is often confused, is innovation or creativity. Innovation is not creativity because this term is a concept that takes place in the human mind and whose purpose is a new invention, while the purpose of innovation is to bring this invention to life. To make innovation clearer, its difference from creativity can be summarized as follows (Oldham & Cummings, 1996; Asbari et al., 2021):

- Creativity is about generating new and useful ideas, while innovation is the selection and implementation of these ideas.
- Different thoughts are important in creativity, while one point is focused on innovation.
- Creativity deals with radical ideas, while the scope of innovation is in general.
- Generating a new idea is about individual creativity, while innovation is more organizational.
- Creativity is an input for new processes, while innovation is output for interest groups.
- Creativity requires thinking differently, while progress steps of innovation are determined.
- Original ideas are in question in creativity, while a distinct process is operated with methods known in innovation.

While this comparison tries to clarify the difference between the two terms, it helps to understand creativity in-depth as well as innovation. When looking at the origins of the word, it is understood how much importance is given. The word was first used to mean the use of new methods in social, cultural, and administrative fields, later it was described as the "driving force of development" by Schumpeter (1935). Also, Schumpeter classified entrepreneurship according to the innovation style. In doing so, it also takes into account the increase in income from existing resources as well as changes in the production function. According to Schumpeter (1935), innovation types in terms of entrepreneurship can be listed as follows:

- New product development: New product development means developing a product that is not in the market as a result of R&D studies, and it is also carried out by making quality improvements on existing products and delivering them to the consumer.
- Use of new production methods and techniques: This item, which shows that innovation can be not only in products but also in production systems, includes new production methods as well as commercial successes that can be obtained by using existing materials differently.
- Finding new markets: Every market that has not yet been entered is considered new. The important point here is that the market is not yet discovered, but that it is not a business that turns to meet the determined needs of the target audience.
- Finding new sources of raw materials or other inputs: This type of innovation refers to inputs that cannot or are difficult to obtain by other businesses and the benefits gained from accessing these resources.

- Achieving a new organizational position in an industry: Industry leadership with a strong competitive position or entering the market beyond the previous monopoly structure is included in this type of innovation.

These substances, which offer a wide perspective on innovation, show that it is necessary to go beyond the first meaning of innovation. The main point of this is that new and different ideas can be tried at every stage of the production process. For this reason, new and different solutions or alternatives can be used in all stages from the supply of the necessary factors for production to the processing methods of these factors and until the end of this process. The position of the product in which sector and its marketplace are determined in line with the decisions taken in this context. While doing all these, learning from the mistakes of others and ensuring sustainability in the achievements should be one of the main objectives. Therefore, it is beneficial to refer to learning and continuous improvement within the scope of this title.

Continuous Improvement Mindset

Continuous improvement, which is seen as one of the successful methods of adapting to change, is a way of making learning permanent and reflecting on activities. Recognizing that quality in goods and services is a management approach that requires care in all stages, not with post-production processes, has made continuous development important. In addition to the importance given to the satisfaction of employees and customers in human-oriented management approaches, it is necessary to improve processes. Since the sustainability of the improvement achieved depends on continuous improvement, there is continuous process management with no beginning and ending (Echour & Nbigui, 2021). Firstly, the current situation is considered as input, then a better level is passed in the processes and the data of this new situation are re-evaluated. Therefore, as each result contains new baseline data, a permanent improvement occurs like the Deming Cycle.

It increases the effectiveness and efficiency of the activities by putting people at the center of the situation analysis, solution development, taking action, implementation and evaluation cycle. This cycle, also known as PDCA (Plan, Do, Check, Act) cycle, is considered as the formula for achieving quality in total. Correcting mistakes means bearing the costs of internal and external failures, so it means more costs for the entrepreneur in the long period. Therefore, the value of giving importance to measurement and evaluation activities as well as prevention activities becomes more apparent in the phase of eliminating the costs of poor quality.

Achieving sustainability by gaining a certain quality standard is a factor that depends on the interaction of many factors; market, money, management, man, materials, modern information methods, machine, mounting product require, motivation. Improving and improving existing processes is known with the Kaizen 5S principle; seiri, seiton, seiso, seiketsu, shitsuke (Widodo et al., 2020). These principles require participation, which means sorting out unnecessary activities, sorting and defining essential tasks, a clean work environment, standardizing and maintaining.

The expected results from such approaches are positive organizational outcomes such as employee development, high efficiency, and quality awareness, communication, and division of labor, developing solutions rather than problems, increasing creativity, successful implementation of new ideas and opinions. The basic principle is to move forward with small but decided steps, permanently. For this reason, it is important to take a certain degree of risk, start immediately, and control the continuity or sustainability.

Learning Organizations

Initiatives that understand the value of knowledge adopt it as a management approach to develop their business by finding new ways of using this knowledge. Holism, which is an important part of the system approach, deals with the relationship between the enterprise and its periphery within the framework of mutual information exchange and focuses on the continuity of this relationship (Veldhuizen, 2021). According to this point of view, which finds the relationship between the enterprise and its environment vitally important, initiatives that cannot adapt to change are doomed to disappear. This extinction, named entropy, requires a dynamic balance and invites the entrepreneur to learn continuously to survive.

Senge (1990) focuses on five basic elements while defining learning organizations; system thinking, personal mastery, mental models, shared vision, and team learning. Organizational learning, which is considered, as two types as single-loop and double-loop, is another approach that emphasizes that the entrepreneur should take into account the external environment. Solution processes initiated to get rid of existing problems as soon as possible without questioning and thinking only contribute to the elimination of errors, since they cannot go beyond reacting to change. Conversely, in the double loop learning process, the causes of the problem are addressed and the necessary structural changes are initiated by going beyond monitoring the external environment. Thus, while the elements that form the basis of the enterprise such as culture, politics, and strategy are brought to a level where the same problem will not be encountered again, development is achieved on the other hand. Thus, beyond the daily routine problems, a proactive approach paves the way for continuous learning-centered development.

Information is collected to evaluate the current situation and to proceed according to these evaluation results. In addition, secondary data are used to see environmental change. Information is interpreted and transferred to organizational memory so that all interests can understand the information. Thus, information that becomes a part of the decision-making process contributes to development as a part of continuous learning. Even if the learning starts with learning from the mistakes or the past, there are also extrinsic knowledge-oriented types such as learning from customers or other businesses. Learning to learn together, that is to create synergy, is at the highest level of all of these processes. Synergy is one of the indispensable elements for expanding and using knowledge effectively, as well as extending the relationship between initiative and learning beyond activity-oriented use. Otherwise, the initiative will remain as an organization that only knows or understands and will adopt reactive strategies (Isaak, 2009). However, what is expected from synergy is to be thinking and even learning organization. Increasing competition and constantly changing consumer demands force entrepreneurs to become a learning organization.

According to the system approach, which is determined that the initiative is a whole that includes more than its parts, only personal competencies are not sufficient to become a learning organization. Therefore, a structure suitable for learning as a team is required as well as mental preparation. Otherwise, since internal and external stakeholders do not share the vision of the venture, they will have problems focusing on the common goal and seeing the power arising from unity (Chiu et al., 1999). This perspective, which should come to mind when synergistic entrepreneurship is mentioned, is possible with an appropriate organizational structure where individuals who are willing to learn can use their thinking and questioning skills.

To share knowledge in a human-oriented, open, and equitable manner, there is a need for structures that allow practices such as experimental perspective and benchmarking, as well as learning habits from different sources such as open communication, culture, customers, and experiences. Only in this way,

effective and efficient steps can be taken by considering the external environmental elements as well as the main and sub-units of the system (Ince, 2018a). The initiative can move from one level to another by seeing the better, rather than resisting change. Organizational change, which is addressed in subjects such as organizational development and reengineering, is the use of learning as a means of regeneration and achieving a better position. The need to take the pains of change, which can sometimes be quite challenging, may be the result of anticipated long-term improvement and repositioning anticipation. Only in this way can chronic problems be solved radically and a business can be created that can go beyond routine issues and focus on new and different solutions (Mashhady, 2021). Therefore, businesses may be willing to try different management approaches for sustainable competitive advantage.

It pushes entrepreneurs to go beyond focusing on individual talents with a professional point of view, to create a learning culture, and to grow together, especially in global-scale competition on issues such as meritocracy and talent management. This perspective, which is also considered as a new human resources approach as a part of the brand creation process, is another vital issue that emphasizes the importance of synergy (Brown & Tannock, 2009). As the critical importance of hidden information is gradually being understood, it is starting to make being a learning organization a necessity rather than a choice. At this point, it seems beneficial to refer to the concept of synergistic entrepreneurship, which attaches great importance to information.

SYNERGIC ENTREPRENEURSHIP

It is possible to focus mainly on two points to create synergy in a new or radical enterprise. A synergetic initiative can be achieved firstly in internal processes and then with the external environment. The system approach, which deals with the interaction of the initiative consisting of different sub-units with the external environment from a broad perspective, emphasizes continuous development. In addition, the strategic perspective focuses on the survival success of environmentally friendly entrepreneurs. The McKinsey 7S Framework combines seven factors, taking into account their complex relationships with each other, and refers to the harmony of an enterprise at all levels, including corporate, operational, and functional; strategy, structure, system, leadership style, shared value, staff, and skills. When these elements are examined carefully, it is seen that the features such as structure, style of leader, shared value, and skills are structures that are shaped directly by the founder of the initiative. Although the culture of the enterprise is shaped according to different variables, it is known that the founding entrepreneur has a direct effect on the dominant culture (Khan, 2021). Therefore, the entrepreneur needs to handle the business with its internal and external elements in a synergistic focus.

It is expected that the strategy adopted in the enterprise will manifest itself at all stages of the initiative through the goals, objectives, policies, and tactics and achieve unity of purpose. It will have an impact on the vision and mission approaches, which are the basic elements of the strategy (Mintzberg, 2009). The strategic point of view emphasizes that other businesses, market conditions, and legal sanctions, in short, the close and distant external environment should be taken into account in the competitive environment. When all these elements are combined, the entrepreneur must take into account all the actors affecting the sector, and adopt the appropriate strategy and create a structure that will help to make effective decisions (Lunenburg, 2012). Only in this way can harmony between the internal and external environment of the enterprise and the sustainability issue be resolved. This approach, which requires a macro perspective, is only possible with the synergy to be provided with insider and outsider stakeholders.

Today, when virtual organizations and network structures, which do not even have physical locations within the scope of e-commerce, have turned into giant enterprises on a global scale, it is not possible to maintain the approach of selling whatever I produce. For this reason, adapting to change in a consumer-oriented manner is only possible with solutions that understand the consumer. Since the way to reach these solutions is through knowledge, it is possible with management strategies that value people with the desire for continuous learning and development.

The entrepreneurs' ability to rely on their employees and strategic partners as well as their knowledge and skills are seen as the basis for focusing on the core field of activity and creating value. Looking at the details of the value creation process, it is necessary to focus on the best part as a result of practices such as learning from others or differences. Thus, since the best part in terms of costs and difference is the activity in which the business is superior, it will make it easier to withdraw from areas with low income but high costs. Purchasing these units of the cost burden from other businesses or procuring them through certain agreements are among the last requirements of competition (Eikebrokk et al., 2021). From this point of view, it would be beneficial to mention the perspective of the synergic entrepreneur that creates value by learning from differences and understanding what kind of partnerships can be applied in a challenging competitive environment.

Learning From Differences

The tendency to classify people according to certain patterns is done for purposes to understand and interpret them and finally predict their next behavior. Many types of these classifications can be made in every field from biological features to cultural characteristics. Efforts to understand and ultimately direct human behavior within the enterprise also fall into the field of management. Goals such as motivating the employee, making efforts for specific goals, and walking together to the desired point in the future are listed.

The sciences that seek answers to questions such as why people exist or why they want to work have different perspectives. However, when the event is considered in terms of psychology or organizational behavior, it is also possible to encounter concepts such as being a virtuous person or an organizational citizen (Zacher & Rudolph, 2021). This subject, which is open to discussion, should be handled as a synergy tool for the entrepreneur. This means that classifications based on age, gender, race, education, or other factors are expected to be used to make people willing to contribute, not to stereotype them.

Perceptions such as right-wrong or good-bad rely on different sources while managing people's behaviors and value judgments. With the contribution of social norms, the individuals improve a personality that adopts different values by going beyond their biological characteristics. For this reason, the subject of personality is one of the topics that are dealt with quite deeply and from different scientific areas. Fortunately, a single and successful formula could not be found and people's independence is not restricted. The complex structure of the mental process has made understanding humans an endless effort. The contribution of this complexity to the organizational environment is being able to look from different aspects, offering new solutions and creativity.

It is to understand the differences expected from the synergic entrepreneur as a value and to create a business environment suitable for the contribution to be obtained from these differences. Managing differences or directing them for the goals of the organization is only possible with the 7S factors mentioned earlier. When the highlighted factors are examined closely, it is seen that many factors such as the management style and the suitability of the organizational structure are as important as open com-

munication and effective communication (Khan, 2021). Of course, as in all management matters, there are situational factors here too. For this reason, the characteristics and personal skills of the employee are as important as the qualifications of the job and the sector. While the changing environment and organizational structure provide appropriate conditions, the personal inadequacy of the employee or the entrepreneur who takes the leadership role may make teamwork and synergy arising from differences impossible. Therefore, considering the situational factors, it is very important to have structures suitable for the job and the person. The same situation is also valid for external sharing. Since entrepreneurs cannot act jointly with everyone, they should determine their strategic partners well, especially in international markets. In the next title, the subject of strategic positioning in the global and overwhelming competitive environment is discussed.

Strategic Partnerships and Globalization

When the situation of an entrepreneur is considered from a strategic point of view, a macro perspective is required. An entrepreneur with a strategic awareness will take steps to create value after the necessary external environmental analysis to bring the business to a good position in global competition. The interrelationship between technology, environment, and business makes it almost impossible to act alone, especially in the diversification strategy. Diversification strategy, which has various alternatives such as related, unrelated, or clustered, is a growth-oriented approach and requires radical or gradual changes in the current job description to increase the effectiveness of the activities (Iacobucci & Rosa, 2005). At this stage, benefiting from local businesses, distribution companies, and workforce will help to minimize the risk, especially in the case of opening a new foreign market.

Network organizations, one of the internet age versions of utilizing techniques such as outsourcing, offer a variety of advantages depending on the degree of focusing on their core business if they gain competitive advantage with internal, balanced, and dynamic network organization types. The inevitable development of the internet on a global scale makes such mergers even more proliferation of virtual organizations while making competition even more difficult. For this reason, focusing on creating synergies with a geocentric approach while thinking about a multi-form structure can be seen as one of the keys to achieving a leadership position by getting rid of certain patterns. Uncertainty and risk factors force businesses with sustainability concerns to think globally by going beyond the polycentric and ethnocentric perspectives. This situation reveals the importance of creating a synergistic environment, especially in multinational structures. Multicultural and synergistic perspectives act with slogans such as "our and their ways are different from each other, we can learn from each other" or "there are many best ways, these paths complement each other, mutual learning is possible". The reason for this is that the coexistence of different cultures is considered functional or productive, and seen as a source of creativity (Farah & Mehdi, 2021).

The effect of technology on coordination has been demonstrated in the researches on the relationship between technology and business conducted by Thompson (2003). The technology relationship, which is classified as mediating, long-linked and intensive, shows the degree of commitment according to the sector in which the business is located. Especially in businesses using intensive technologies, the mutual harmony of the enterprises becomes very important because of the multi-directional dependence between the activities. Therefore, working in harmony by avoiding conflict is more vital in such sectors where technology has a kind significant impact on coordination.

While adopting organic structures in non-routine works increases flexibility, it also increases the tendency towards strategic partnerships according to variables such as research need and job diversity. One of the factors determining the degree of partnership is the commitment of the business to its near and distant environment. According to the Tavistock Institute research of Emery-Trist (Emery & Trist, 1965), businesses should take position according to the speed of change of the environment and the strength of the mutual relations with the environment. Four linkages, namely internal interdependencies, input transactional interdependencies, output interdependencies, environmental interdependencies, will determine the degree of mutual agreements. Strategies based on solidarity rather than competitive external relations can take place in different types such as gentlemen's agreements, internal relations, and joint venture. However, synergistic entrepreneurship looks at these mergers or joint action strategies from a broader perspective with a focus on compliance. This perspective, which can be seen as one of the proactive strategies, provides a positioning that helps to overcome environmental uncertainties such as limited rationality, sustainability in an ever-changing environment, and the difficulty of making effective decisions.

Matrix organization structures preferred in giant structures that require the cooperation of global companies are another way of doing business that makes synergies obligatory. The entrepreneur should know how to adapt to other initiatives in matters such as time, technology, and business processes, and to act jointly in solving problems (Kovaçi et al., 2021). In such an environment, any incompatibility other than functional conflict will cause the business to be disrupted largely and a crisis environment will arise.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Synergy, which is one of the success keys of entrepreneurs who should be on the alert for sustainability in the ever-changing modern world, is discussed, and then the changing nature of entrepreneurship is mentioned in this chapter. Following the synergistic perspective, which is a concept centered on innovation and continuous development, the subjects of high-performance team learning from differences are discussed. Because the basis of synergistic entrepreneurship is that differences are evaluated as an advantage and the ideas arising from these differences are considered as one of the triggers of creativity.

Synergy and mutual learning are inevitably part of the change. While new technologies find different answers to consumer needs, the entrepreneur must deal with change. For this reason, using all differences as a part of innovation and culture will create accurate results in entrepreneurial decisions by opening the way for creative ideas. Since R&D researches, which require especially high investment capital, force entrepreneurs to think globally, they force them to be open to innovations to understand different cultures and different needs (Isaak, 2009). Otherwise, the entrepreneurs, who cannot go beyond their cultural values and personality structure, will tend to make intuitive decisions and will not go beyond imitation. Understanding the young generation with different behavioral habits in the changing world and focusing on their future needs can only be possible with a broad perspective (Ince, 2018b). The global competition environment, which causes abandonment of the perspective of what I produce and sell, has pushed entrepreneurs to create a culture of synergy and develop new innovative ideas by establishing effective teams (Holtström & Anderson, 2021). The perspective of individuals who grow up in societies with similar cultural values and external influences can be quite different from the perspective of individuals who are open to innovations and to look differently. Therefore, the entrepreneur's desire to invest in effective decisions obtained because of common sense should be supported with solid founda-

tions and made viable with an appropriate enterprise ecosystem. In this process, small or large supports to be given in every field such as investment, consultancy or technical services can be very useful in contributing to the country's economy.

In addition to the synergetic atmosphere created within the organization, effective use of resources can be achieved in the value creation process with diversification strategies such as collaborations, strategic partnerships, and network organizations. Different local consumers can be reached at less cost without being stuck in legal barriers. In addition to all these, the expertise advantage brought by focusing on core talent may help to use time effectively and focus on innovations in the main product range. In different cultures, creating an alliance can be a difficult process, but functionalizing potential conflicts also means achieving creative results. Adoption of the synergistic culture and strategic perspective by all parties can be seen as one of the keys to leadership in global competition as well as sustainability.

In the light of all these, it can be suggested that professionals who are decision-makers should create a suitable ecosystem for synergistic entrepreneurship and provide supports that facilitate the process. However, the willingness of institutions and organizations that lead the economy to take such steps for initiatives also depends on a clear demonstration of the importance of synergistic entrepreneurship. For this reason, it is recommended that researchers examine successful synergistic entrepreneurship examples with environmental conditions and share these studies with rule-makers.In economic markets where the butterfly effect can be observed easily, even small supports may be critically important. Sometimes it can be helpful to remove procedural barriers and not cause difficulties. Considering entrepreneurship synergistically requires addressing all factors from a broad perspective. In this complex process, the ability to learn from differences and compromise principles is also required for global competitive advantage. When the opportunity knocks, it may not be a long time to act. Sustainable success is possible by taking the right strategic steps at the right time.

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KEY TERMS AND DEFINITIONS

7S Model: The McKinsey 7S model defines seven elements that help organizations achieve goals, implement change, and create harmony; strategy, structure, system, leadership style, shared value, staff, and skills.

Adhocracy: It is a flexible, adaptable, and informal form of organization that is defined by a lack of formal structure that employs specialized multidisciplinary teams grouped by functions.

CP: Cleaner Production is a preventative approach to managing the environmental impacts of business processes and products.

CSS: A Corporate Synergy System is a management mechanism through which a group of manufacturing companies works together to achieve certain production or management goals.

MBI: Management Buy-In is about procuring the necessary management team for new investment.

MBO: Management Buy-Out is about outsourcing the necessary management team for new investment.

PDCA: Plan, Do Check (Study), Act, also known as the Deming Cycle is a continuous quality improvement model consisting out of a logical sequence of four repetitive steps for continuous improvement and learning.

R&D: Research and development is the process by which a company works to obtain new knowledge that it might use to create new technology, products, services, or systems that it will either use or sell.

Synergy: It is an interaction or cooperation-giving rise to a whole that is greater than the simple sum of its parts.

Chapter 23
Self-Perception of Leadership in Mexican Businesswomen

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ABSTRACT

The purpose of this chapter is to analyze the self-perception of their own leadership in Mexican businesswomen. With this information, it can build a female leadership model, which allows knowing the self-perception of skills and characteristics they have as leaders, the situations that led them to use this leadership, the challenges they face daily in the performance of their activities, and the context in which they operate. Among the main results, it was found that Mexican businesswomen have a balanced leadership between the search for economic results and the development of quality relationships. This means that they manage to have efficient communication, they take their employees into account in the development of their companies, but they are also interested in the achievement of organizational objectives. They develop this leadership in a context where family support is key to achieving success and the main challenge they face is economic. Also, they have managed to break with the traditional scheme of work and female business leadership.

INTRODUCTION

Different studies of female executives and businesswomen in the world context have highlighted the importance of studying female leadership and its applications in organizations (Galbreath, 2011; Jia & Zang, 2013; Torchia, Calabró & House, 2011; Hoobler, Masterson, Nkonomo & Michel, 2018; Hoober, Lemmon & Wayne, 2014; Minelgaite, Edvardsson, Zydziunaite & Vaiman, 2015; Gipson, Pfaff, Mendelsohn, Catenacci & Burke, 2017).

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Throughout history, women have played different roles, which have caused changes both in the family structure and in the business. This economic opening brought with it an evolution of thought, not only as individuals, but also as a society, where it is sought that there is a representation of both genders in each of the social environments. These changes must be analyzed according to the new occupational structures and the dynamics of the labor market to evaluate the barriers, challenges, and opportunities that have been presented to women and thus determine their current needs (Heller, 2004).

Some authors agree that as women begin to have a greater productive and labor participation, the way they educate their children, their relationships and their perception of themselves and society, the economy, politics will change.

The characteristics that women contribute to leadership, according to the existing literature in this regard are:

- Effective communication in a natural way.
- Humanistic point of view, both in the family and in business.
- Empathy.
- Collaborative work.
- Intuitive skills. They use intuition in analyzing and solving problems.
- Openness to participation and democracy.
- Look for long-term win-win relationships (Puyal & Sanagustin, 2006).

As is known, these characteristics influence the leadership and management style carried out within organizations. Female leadership tends to be viewed as more collaborative, emotional, and cooperative than male leadership. The fact that women work in leadership positions shows their interest in breaking the so-called "glass ceiling", which is a phenomenon that makes it difficult for them to access senior management positions (Hernández & Camarena, 2005).

Eagly & Carli (2007) claim that this situation has begun to change, and women have greater access, even in areas that were previously exclusive to men. These authors propose the concept of "labyrinth of glass" as a new metaphor. In this way, they highlight that, at present, women are not being blocked from accessing the highest positions, but they do have to overcome different obstacles and travel complex paths to reach them.

Recognition of the executive work of women today continues to be more symbolic than real. Men mostly hold the highest positions, even when there are women more prepared within the company for those positions.

Having more women in organizations makes them a better place to work for everyone, regardless of gender. According to the Center for Creative Leadership (2020c) having a higher percentage of women in an organization helps to:

- Improve the job satisfaction.
- Increase the organizational dedication.
- Have more meaningful work.
- Decreased burnout among the employees.

It is undeniable the important job position that women have reached today and the perspective that is had about their imminent rise in the corporate pyramid in the near future. This advance has been the

product of the effort of women for equal opportunities, which became more evident in the middle of the last century when the pressure from different social classes to achieve a more equitable treatment allowed progress towards construction of new ways of thinking (Rodríguez de Lecea, 2008).

Background

For just over a century, various authors (Stogdill, 1948; Katz & Kahn, 1951; Blake & Mounton, 1985; Hersey & Blanchard, 1969; Vroom & Yetton, 1973; Fiedler, 1967; Rost, 1991; Bass & Avolio, 1994; Mintzberg, 2009; Lussier, 2011, Northouse, 2016) have been devoted to studying the concept of leadership, which has had different definitions, according to the angle from which it is observed. The field of application of leadership is diverse and includes a wide spectrum of definitions, theories, models, and evaluations (Lupano & Castro, 2013).

According to these multiple theories, leadership can be analyzed from 4 basic perspectives: personal attributes, behavioral theories, situational models, and the attributional perspective (Gómez-Rada, 2002). These perspectives can be explained in the Table 1.

Table 1. Leadership perspectives

Leadership perspective	Main authors	Description
Personal attributes	Weber (1947), Jenkins (1947), Stogdill (1948), House (1977), Green-Leaf (1977), Burns (1978), Bennis (1984), McGregor (1966), Romero (1993), Gray, Sproule, & Morgan (2009).	Leaders have qualities that distinguish them from followers. Some people are better qualified than others to exercise leadership.
Behavioral theories	Lewin (1947), Blake & Mounton (1965), McGregor (1966), Hersey & Blanchard (1972), Hollander (1992), Rost (1993), House & Aditya (1997), Avolio, Bass & Jung (1999), Lussier y Achua (2002), Avolio & Bass (2004), Rodríguez (2012), Shaw, Erickson, & Nasirzadeh (2015).	Leadership is the behavior of an individual who participates in directing group activities. It is theorists were interested in definitions that provide the basis for objective observations, description, measurement and experimentation.
Situational models	Mumford (1909), Brown (1936), Bass (1960), Fiedler (1967), Stogdill (1975), Wofford (1981), Yammarino (1991), Holle-Beck, Ilgen & Sego (1994), Wilson (1994), Popper (2001), Vecchio, Bullis & Brazil (2006), Bosse, Duell, Memon, Treur & Van Der Wal (2017).	It is part of the idea that the behavior of the leader is affected by a series of factors in the context in which such leadership is exercised where it determines its effectiveness. Leadership depends on the situation and therefore is relevant to it.
Attributional perspectives	Eden & Leviatan (1975), Calder (1977), Mitchell, Larson, & Green (1977), Meindl, Ehrlich, & Dukerich (1985), DeVries (1997), Kenney, Blascovich y Shaver (1994); Kouzes y Posner (2002).	Leadership can be conceived solely as the observable reason for the results that have been produced. Analyze the reason why a group, organization, community or nation has been successful. The most important quality of the leader is to be recognized as such. This recognition is due to the complementation of traits and behaviors observed in a leader.

Source: Own elaboration with information from Bass (2008).

Among the various definitions that can be found of leadership, the most representative is the following: "Leadership is a process by which individual influences a group of individuals to achieve a common goal" (Northouse, 2016, p. 6). It is this definition that opens the door for leadership and gender studies

since it has been proven that the roleplayed by women and men in managerial positions is not the same (Eagly & Wood, 2011).

It should be remembered that leadership is less about a strong, charismatic individual and more about a group of people working together to achieve results. It is because of this, that leadership can be exemplified as a journey: you have different teams, projects, situations, and organizations that may require different leadership skills (Center for Creative Leadership, 2020; French & Bell, 1996).

Leadership, like any human behavior, is subject to invariable human characteristics (such as personality, learning history, motivations, values, attitudes, beliefs, skills, and knowledge) and to the context in which it is being developed, which will determine its effectiveness (Gómez-Rada, 2002).

McFarland (1969, cited in Sabucedo, 1996) pointed out that the leader is the one who makes things happen, otherwise they would not happen. The impact of leaders has been evident across nations, communities, and organizations. It is important to identify the type of leadership one has, to notice which are the areas of opportunity and to set realistic goals about where one wants to get to as a leader.

Developing effective leadership can help solve problems such as problems with interpersonal relationships, difficulty building and leading teams in the organization, problems with changing or adapting, failure to meet business objectives and too narrow a functional orientation (Center for Creative Leadership, 2020b).

The Center for Creative Leadership has identified 10 characteristics of a good leader, which are listed below:

1. Integrity. Integrity is essential for the individual and the organization. Integrity may in fact be a potential blind spot to the organization's goals. It is extremely important that leaders of different hierarchical levels have integrity.
2. Ability to delegate. Effective delegation of tasks can be challenging for the manager. The goal is not only to get rid of task, but to find the ideal person to perform each of them and at the same time, facilitate teamwork, autonomy, and empowerment of employees. A good delegation can be a synonym of trust in the team.
3. Communication. It is important for the leader to know how to communicate in different ways, from conveying information to coaching people. In addition, the leader must be able to listen and communicate with a wide range of people with different roles, different cultures and identities.
4. Self-Awareness. This skill is of utmost importance for leadership. The better a leader understands himself, the more effective he Will be. In addition, it is important for a leader to know how to develop self-awareness and how other people see him or her.
5. Gratitude. Being grateful can make better leaders. Gratitude can help improve self-esteem, reduce depression and anxiety, work better in a team, and feel part of a group.
6. Learning agility. It is defined as the ability to know what to do when you don´t know what to do. Great leaders are great learners, with great agility to identify their areas of opportunity and the best way to develop them. This ability can be fostered through practice, experience, and effort.
7. Influence. Influence is the art of convincing people, by means of logical, emotional or cooperative appeals, to achieve goals. It must be remembered that influence is different from manipulation and must be done in an authentic and transparent manner. To exert influence, a leader must have emotional intelligence and build trust in his work team.
8. Empathy. Empathy is related to job performance and is a fundamental part of emotional intelligence and leadership effectiveness. An empathetic leader makes subordinate work more effectively and is

perceived as a better performer. Empathy can be developed so it is important to consider to improve work.

9. Courage. During work it can be difficult to communicate a new idea, offer feedback, or point out a concern to someone higher up. Therefore, courage is an important skill for good leadership. Instead of avoiding problems, leaders must step up and try to fix them. The leader must create a healthy work culture that allows employees to raise their voices to be heard.
10. Respect. One of the most important things a leader can do is to treat people with respect. Respect Will ease tensions and conflicts, build trust among workers, and improve efficiency.

Good leaders exhibit these ten characteristics, but these are not limiting. There may also be cases in which a leader only has some of them, but this will allow to know what the leader should develop and how to apply them according to each of the situations that arise.

There are 16 key leadership competencies that are essential for the success of leaders in organizations, which are named in the Table 2.

Table 2. Key leadership competencies

Leading competencies for…	Key leadership competencies
Leading the organization	Strategic perspective
	Being a quick study
	Decisiveness
	Change manegement
Leading others	Leading employees
	Confronting problem employees
	Participative management
	Building collavorative relationships
	Compassion and sensitivity
	Putting people at ease
	Respect for differences
Leading yourself	Taking initiative
	Composure
	Work-life balance
	Self-awareness
	Carrer management

Source: Center for Creative Leadership, 2020b.

As can be seen, there is no easy way to define and explain leadership. Leadership can vary so much from one person or situation to another that it is difficult to find a single explanation of how to develop it efficiently. The need to continue studying it is evident, within different contexts and cultures, so that the importance of this ability in all individuals can be better understood and defined more clearly.

MAIN FOCUS OF THE CHAPTER

Women's Leadership

According to Hoobler, Masterson, NKomo and Michel (2018) having more female managers is good for business. These authors analyzed the effectiveness of women as organizational leaders, demonstrating the great value of diversity and inclusion for companies. This ideology has served as the basis for various research studies that analyze the performance of women as leaders from different disciplines. In order to analyze female leadership in organizations, some theoretical foundations have been developed like: Gender Supportive Climate (Kanter, 1977), Social Identity Theory (Tajfel & Turner, 1979), the Upper Echelons Theory (Hambrick & Mason, 1984), the Women´s unique contributions Agency Theory (Jensen & Meckling, 1976), the Legitimacy Theory (Suchman, 1995), the Resource Dependence Theory (Pfeffer, 1972), the Resource-based view of competitive advantage (Barney, 1991) and the Upper Echelons Theory (Hambrick & Mason, 1984).

These theories have served as the basis for some studies, which have consistently demonstrated the importance of having women in top management positions, the impact of this leadership on company performance and the opening that women have had to key positions in the organizations.

In recent decades, the entry of women into the business world has had a considerable increase, however, there are still some important barriers. The challenges faced by women in leadership appear throughout the world, across the country-based cultures and religious traditions, even where there has been progress (McLean & Beigi, 2016).

As warned by Carter and Silva (2010) we should not be fooled into thinking that, because there has been some progress, we have received the goal of equity. We still have a long way to go before we achieve equity. The evidence shows not only that women are lagging behind men in obtaining leadership positions, but also that the hierarchical advancement of women has slowed (Catalyst, 2015).

When companies have women in leadership positions, the decisions of these leaders are highly questioned (Kanter, 1977). In addition to this constant questioning, women face an invisible barrier that prevents them from ascending to higher leadership positions, this barrier is known as glass ceiling; this term was introduced in 1986 by two Wall Street Journal reports (Hymowitz & Schellhardt, 1986).

Eagly and Carli (2007) identified some limitations with the concept of the glass ceiling, which implies that everyone has the same access to lower positions until this unique, invisible, and insurmountable barrier is found for women. Later, they bring the concept of leadership labyrinth, which implies not a barrier, but a journey full of challenges, which can and have been successfully overcome by women.

According to Northouse (2016), the leadership labyrinth is composed of three important elements which are:

1. Investment in human capital between women and men. Where important issues like education, work experience, development opportunities and home-work conflict are found.
2. Differences between women and men. Such as the style and effectiveness of each one at work, compromise and motivation, self-promotion, negotiation, and the inherent traits of each gender.
3. Discrimination against female leaders or prejudice. In this element are the following concepts: gender stereotypes, biased perception and evaluations, vulnerability and reactance, and cross-pressures.

At the same time, the concept of a gender gap was developed. The Gender Gap in leadership is a global phenomenon where women are disproportionately concentrated in lower-level and lower-power leadership positions compared to men (Powell & Graves, 2003).

To evaluate this concept, the Global Gender Gap index was developed, created by the World Economic Forum, which measure the performance of states and regions across four sub-indices of equality (Huasmann, Tyson, & Zahidi, 2008). These sub-indices measure a society performance on behalf of women in terms of political empowerment, economic participation, educational attainment, and health and survival (Gentleman, 2010). For the evaluation of this index, 153 countries are considered, within which, for the year 2020, Mexico was in the 25th place with a global index of 0.754 (where 1 is the maximum) (World Economic Forum, 2019).

Mexico's performance in terms of the Global Gender Gap Index is presented in Table 3.

Table 3. Mexico's global gender gap performance

Sub-indices	World ranking	Value
Economic Participation and Opportunity	124	0.574
Educational Attainment	54	0.997
Health and Survival	46	0.979
Political Empowerment	14	0.468

Despite being well positioned in the Global Gender Gap index, there is evidence that Mexican woman still had limited success in breaking the glass ceiling in the corporate world. The most difficult hurdle for women in achieving gender parity is that of economic participation, no matter which country belongs.

Developing Women's Leadership: Issues and Challenges

In Latin America, there is little attention to issues related to the participation and leadership of women in decision-making positions, both at the public and private levels. So far, some initiatives have been consolidated to achieve the representation of women in political positions with the "quotas" in the houses of representatives, but, a comprehensive agenda has not been developed where, in addition to filling these quotas, it is possible to implement a program for identifying opportunities and developing women leaders in all economic areas. As time has passed, the gap in participation in economic activity between women and men in Latin America has been closing, but there is still a long way to go.

Chaney (1979) observed that when women were in the public eye, serving in government or in other organizations of civil society, their activities were almost always extensions of their family responsibilities.

According to Maxfield (2007), women attribute their success in the corporate arena to having worked harder than their male counterparts, often reporting that they worked twice as hard as their peer. Their prospects for upward corporate mobility are stymied by stereotypes and social norms rather than overt discrimination. Compounding their problems is that they tend not to be as mobile in their work options as a result of family interested in competing for titles or power, but rather remain more focused on successful completion of task. The challenge of managing the work-family balance weighs heavily upon

women employed in the corporate community and shapes the choices made in developing careers and moving up the corporate ladder.

According to data from the International Labor Office (2019) in Latin America and the Caribbean, women represent 51.7% of the economically active population, also Mexican women are the ones who work the most in the American continent since they work 64 hours a week. Within the labor market, four out of ten women participate in it, in contrast to a ratio of eight out of ten men. This shows a real need to know and understand the situation that women workers present in the development of their leadership.

The lack of role models, wage inequality, the feeling of isolation, discrimination, stereotypes, and the effect of the glass ceiling are some of the many barriers that women face in their professional development (Bradich & Portillo, 2001).

Gender differences exist within organizations, but this is not why these differences should be taken as limiting for the female gender. These characteristics should be considered to provide diversity in the management of companies, obtaining the best characteristics of each of the styles for a more effective administration of organizations.

The style differences between men and women and gender stereotypes in the leadership domain seem to be explained essentially by two phenomena: firstly, there are differences in the behavior exhibited by male and female leaders and, secondly, there may be stereotypes associated with effective leadership, which prevents many women from considering themselves good leaders (Moreira, 2010). Both phenomena indicate the social expectations that are placed on women and that impair their access to leadership positions (Lupano & Castro, 2011).

These considerations mean that proper feminine characteristics such as orientation and concern for others (expressive/communal traits) are not considered to be expected for leadership positions, fostering biases against women in the selection, promotion, training, and occupation of managerial positions (Cuadrado, 2004).

In the case of Mexico, women are characterized by:

- 4 out of 10 participate in the labor market.
- 8 out of 10 working women are dedicated to the service sector.
- 6 out of 10 jobs are informal (INEGI, 2020).
- In 2019, women were paid 18.8% less than men, based on median, full-time earnings—slightly more than the OECD average of 13.1% (OECD Data, 2019).
- They have high educational levels. 42% of women classified as employers have higher and higher secondary education, a higher percentage than men who in the same area reached these levels of education (37%).
- Having a college degree is no guarantee of a job for women in Mexico. 75% of women college graduates do not have a paid job in the formal economy (catalyst, 2020).
- Only 2% of working women are entrepreneurs, while for men it is 6% (GEM, 2016).
- Most women work out of necessity, and they are not sufficiently supported to make it easy for them to open a business (GEM, 2016).
- The situation of women is complicated because, in addition to being workers, they dedicate themselves to being mothers and to domestic work.
- 36.6% of MSMEs in Mexico are owned by a woman. In 10 years, it only increased 0.8%.
- About 87.6% are micro-business owners and 11.6% are small companies and less than 1% are medium-sized companies.

- They are heads of household in 28.5% of homes in Mexico (INEGI, 2020)
- The age of their companies is less than 10 years and a significant percentage less than 5 years.
- The participation of women in the labor sector encourages honesty, this is for historical reasons where, culturally, it is much more difficult to try to bribe or corrupt a woman (GEM, 2016).
- As for profits, according to the Mexican Association of Women Heads of Enterprises, women spend more than 70% of them for his community and his family.
- Women entrepreneurs in Mexico employ two million 904 thousand 43 people (10.7% of the employed population in the country) (INEGI, 2020).
- According to the World Economic Forum (2019), the wage gap in Mexico is 30%, the highest in Latin America.
- Women entrepreneurs in Mexico face various challenges once their business is already operating. These challenges include access to capital, technology, training, and support networks, in marketing and reconciling work and family life (CONAPRED, 2009).

In this way, it is possible to observe the urgent need to analyze the current leadership of women and generate strategies that allow it to develop in all areas.

SOLUTIONS AND RECOMMENDATIONS

One of the first steps in generating strategies for women´s leadership development is to identify women´s perceptions of their own leadership. As part of this research, a semi-structured interview was conducted with the objective of identifying the dimensions that could explain the phenomenon of female leadership.

Due to the type of study conducted (phenomenological), a sample of 32 interviews was used. The sample was case-type mixed whit a homogeneous sample, better called typical or intensive sample (Hernández-Sampieri & Mendoza, 2018) since it was required that they were businesswomen, owners of their own businesses. In some cases, it also operated as a chain sample as some of the businesswomen recommended someone they knew to obtain in-depth information about the phenomenon of businesswomen leadership.

Based on this qualitative analysis, 7 themes or dimensions were identified: leadership skills, self-perception of their own leadership, leadership characteristics, supports, context, motivations, and milestones and challenges. The themes are listed in Table 4.

Next, an analysis was made of each of the themes with their families, which emerged based on the construction and review of the coding phase.

Theme “Leadership Skills”

This theme reflects the skills that businesswomen consider necessary to exercise effective leadership. Table 5 illustrates the main codes and families in this category.

For Mexican businesswomen, passion for what they do, and the pursuit of self-development are some of the most important skills they need to demonstrate as leaders. They consider that it is of utmost importance that the business they are in charge of is something they are passionate about, because only then will they achieve a complete professional development within it and will more easily achieve their goals. As an example, an interviewee comments: “One of the strongest reasons for starting the business

Table 4. Themes from qualitative analysis

Themes	Description	Family
Leadership skills	This family includes the women´s own perception of their skills and the skills they consider essential to be able to exercise quality leadership within their organizations.	Self-perception of their skills
		Skills necessary to exercise leadership
Self-perception of leadership	Within this family are the perceptions that the interviewees have about the leadership they exercise daily in their organizations (companies and family). Can also be observing some of the challenges or disadvantages that they perceive at the time of leadership.	Self-perception of leadership
Supports	In this family are classified the supports that the women interviewed received or are receiving both in their professional and personal lives. These supports were essential to achieve an integral development as leaders.	Home support
		Personal support
		Economic support
		Null support
		Business idea
Context	This topic describes the context in which the businesswomen interviewed work and develop. The family, work, business, and personal contexts were considered because they have the greatest impact on them.	Business context
		Family context
		Current work context
		Previous work context
		Personal context
Leadership characteristics	This topic analyzes each of the characteristics that businesswomen mentioned when describing a leader.	Characteristics of a leader
Motivation and goals	This theme describes the main goals and motivations that drive their growth as leaders. These goals and motivations were analyzed from different angles such as business, personal or family and professional.	Business goals
		Personal and family goals
		Profesional goals
		Economic motivation
		Work motivation
		Personal motivation
Challenges	The women interviewed commented on and analyzed the various challenges they face in starting a business, keeping it productive and becoming leaders. A classification was used for a more complete analysis: economic, business and personal challenges.	Economic challenges
		Business challenges
		Personal challenges

was the love for photography, for wanting to dedicate myself to this art, it was the desire to work doing what one loves" (E6, 25 years old). Another interviewee believes that "although it is complicated and it is necessary to go through many things, if it is something that I want and that I am passionate about doing, I put all my efforts into it" (E25, 58 years old).

Another view about leadership self-perception is that women themselves are starting to notice that there is a greater presence of women leading businesses. This speaks of a search for gender equity where there is no difference between being a woman or a man, as was very often the case until a few years ago.

Table 5. Theme "leadership skills"

Theme	Families	Code	Freq.
Leadership skills	Self-perception of abilities	Passion	9
		Self-development	7
		Women have a greater presence	5
	Skills needed to exercise leadership	Studying administration	15
		Skills were enough	13
		Skills were not enough	13
		Innovation in skills	6

Another very important aspect that has been placed in this category is the skills that women entrepreneurs believe are necessary to exercise good leadership. In that family there was an unusual event, because there was a division of opinion as to whether the skills were adequate or not. For some women, the skills with which they started the business were sufficient and they did not have to worry about learning anything else, but for some of them, they were insufficient, and they had to learn how to run a business (a skill that turned out to be the most necessary). This can be seen in comments such as: "Even though I have a small business, I have to comply with some formalities, so I had to learn how to manage my money, time and the business" (E2, 46 years old).

In addition to this, there is a consensus among the interviewees about the importance of staying at the forefront in terms of skills, which means that they seek continuous improvement of themselves, to always be updated.

Theme "Self-Perception of Their Own Leadership"

This theme reflects the perception that businesswomen have of their own leadership. The following table shows the main codes of this category among which stand out the fact that they do consider themselves leaders, that they consider that they do have the characteristics to be a leader and a phenomenon of utmost importance which is empowerment through the business.

Table 6. Theme "Self-perception of their own leadership"

Theme	Family	Code	Freq.
Self-perception of their own leadership	Self-perception of leadership	She considers herself a leader	34
		She does have the characteristics of a leader	18
		Empowerment of women by business	16

As can be seen, Mexican businesswomen do consider themselves leaders because they perceive that they have the characteristics of a leader and that exercising various roles allows them to obtain and develop these characteristics. They believe that the fact of being in charge of a business allows them to generate a cycle of empowerment, where they can see an improvement and this will encourage the

Table 7. Theme "leaderhip characteristics"

Theme	Family	Code	Freq.
Leadership characteristic	Leader´s characteristics	Leader must be prepared (knows how to run a business)	11
		Strong character characteristic	10
		Responsibility as characteristic	10
		Support as characteristic	8
		Confidence as characteristic	8

development of other women inside and outside the business, through training or through the example that they themselves generate. This can be seen in the following opinion: "I feel that I must continue to grow so that my influence is more powerful and reachable to more women, for all types of attitudes and situations that arise" (E5, 41 years old).

Within this topic, there is a code which is the empowerment of women by business that stands out for its importance for the research. In this theme we can observe a very clear opinion of Mexican businesswomen about the fact that they feel empowered because they are in charge of a business, a phenomenon that is reflected in the use of words such as being independent, more valued, feeling more important, etc. The following quote is an example: "I really like the fact of being able to be filled with courage and face your fears, of being here in a business and taking it forward, because little by little you realize that there are people who value your work, that makes me feel good" (E15, 48 years old).

This empowerment is also seen in a new attitude they have, an attitude of freedom and power; where consider that they impose their own limits and that it is in their hands to overcome these "glass ceiling" that can become a barrier to their professional development. In the opinion of one interviewee "It is important to recognize that opportunities are in our hands to overcome our own fears or inculcated beliefs, to prove to ourselves that we can do anything we set our minds to, it doesn't matter if you are an entrepreneur or not, the important thing is to conquer ourselves" (E5, 41 years old).

It is also observed that these women consider that the traditional paradigms about women's roles (being only a housewife, dedicating themselves completely to their children and husband, not working, etc.) have been eliminated with the passage of time and have allowed them to fully develop both professionally and personally. Many of them feel that these limits are self-imposed, they are only beliefs or barriers to which we submit. As an example, we have the following opinion: "Women themselves create these limits, but it is not society or the world, or people, it is the thoughts that you set for yourself because of what you have lived or experienced" (E29, 48 years old).

In conclusion, these women believe that being in charge of a business helps them overcome the fears, limits and obstacles that have been imposed throughout history and break the paradigms in which they considered themselves to be made only to be at home and in charge of a family. Having a business empowers them, makes them bigger and allows them to generate a powerful influence on other women, not just their family, which should expand and allow more women to generate their own sources of employment, be self-sustaining and independent.

Table 8. Theme "supports"

Theme	Families	Code	Freq.
Support	Home support	They have help at home	18
	Personal support	Family support	54
		Non-family support	4
		Business support	3
	Economic support	Economic support from husband	13
		Economic support	10
		They had economic support at the beginning of the business	10
	Null support	No current support	17
		Null support at the start	7
		No home help	6
	Business idea	Own business idea	14
		Husband´s business idea	6

Topic "Leadership Characteristics"

In this theme, we can observe the characteristics that women interviewees believed leaders should possess to be effective in their leadership relationships. These can be seen in Table 7.

Key characteristics include adequate preparation for business management, including administration, information technology, accounting, human relationships, etc. The interviewees consider this to be a determining factor, because if the leader does not know how to manage a business, they will soon go bankrupt and lose all their investment. As an example, one interviewee commented: "I think that to be a leader you have to know your job, you have to know what you have to do and what you want to do to show it to others" (E15, 48 years old).

Another characteristic which is necessary for women respondents is a strong character. This may be due to the fact that leadership is often related to the characteristics of the male gender, as mentioned in the theoretical framework, so it is considered that despite the changes that have taken place, some paradigms about what it means to be a leader are still preserved. This can be seen in the following opinion: "On a day-to-day basis, sometimes you have to take a firm stance, with character to make decisions that sometimes may not please the people you are in charge of" (E6, 25 years old).

Among other important characteristics is the responsibility that is acquired when one is a leader, a responsibility that is not only within the company, but a responsibility to employees, family, and customers. The women interviewed also commented that a good leader must support employees, as can be seen in the following example: "We have to understand the people who work around us, we have to support them and show them that we can go out and succeed together" (E23, 56 years old).

Table 9. Theme "context"

Theme	Families	Code	Freq.
Context	Business context	They had employees	25
		Good working conditions	23
		Good relationship with employees	20
	Family context	Quiet/Good family environment	25
		Happy family to be a businesswoman	14
		Proud family	10
	Current work context	They don´t work	20
		Objectives employees	16
		No salary	16
	Previous work context	No other job (prior to the company)	14
		They did have another job	12
		Formerly a housewife	7
		Search for other income	7
	Personal context	they do consider themselves leaders	34
		Non-discrimination	21
		they aspired to be in charge of a company	21

Topic "Supports"

This theme demonstrates how important it is to support businesswomen so they can lead a business and develop effective leadership. Key supports include home support, personal support, and economic support, as shown in Table 8.

Regarding support at home, a large majority of the interviewees commented that they do have help at home, which is indispensable for them to be able to continue in the business.

In the family of personal support, the most present code in the entire qualitative analysis is family support with a frequency of 54. In the perception of the interviewees, family support comes from different people such as spouses, mainly, children and parents. For example, we have the following comments: "My parents have always supported me and now my brothers are already out of the house, I am the only one with my child there; they are the ones who take care of my child if I have to go out to work" (E28, 30 years old); "My husband supports me a lot, he helps me financially" (E32, 48 years old); "The support comes from my family, they supported me to better myself as a businesswoman" (E19, 39 years old).

As can be seen on this topic, the main economic support comes from the husband. It is considered that without this type of support it might not have been possible for the women interviewed to be in charge of a business. This can be seen in the answers given, for example: "One of the supports I had when I started was my husband's economic support to start and build the store" (E12, 55 years old). Another example of this type of support can be seen in the following response: "Yes, I had support, my husband bought me the machines, the tables, everything I needed. Even now when I need to buy something he supports me." (E26, 66 years old).

Theme "Context"

As it can see in Table 9, this topic includes the context in which women leaders develop, analyzing the business context, the family context, and the current and previous work context.

In the context of the business, there were strong trends among women to say they had good relationships with employees, which creates a good working environment within their organization. This is seen as enabling the full development of women as leaders, employees in the company and, consequently, organizational goals. There are some examples such as: "My working conditions are really flexible and favorable, I really like the way the environment has been created in my company" (E7, 33 years old), this phenomenon is also observed in the following example: "The working conditions are good, pleasant in general, I get along well with the employees, it is not complicated at all" (E2, 46 years old).

Regarding the family context, most of the interviewees (87% to be exact) commented that they have a good family environment, which allows them to be in the business and develop their entrepreneurial skills, but also to have a support system at home, where they are confident that their role as mother, wife and daughter can be fulfilled smoothly. They also know they have families who support them and are proud of them. An example of this is the opinion of the following interviewee: "In my family everyone is very loving and kind, they like that I am busy doing something I like and that I am doing well" (E2, 46 years old). Another interviewee commented: "Fortunately, it is a very good environment, the time we have free we try to spend together and spend as much time as possible together" (E15, 48 years old).

Another very important research code is that which stipulates that the women interviewed consider themselves to be leaders. It shows a healthy self-perception of leadership. Some of them provided reasons why they consider themselves as leaders, among them the fact that they are responsible for the companies, that they carry out support activities and that they are the support of their employees and families. Some of these comments are: "I consider myself a leader because we as women have to be leaders in the family" (E31, 37 years old); "I think I am a leader because I see that the employees respect me, they take me into account for many decisions and I can help them to solve some kind of problem" (E29, 48 years old); "I consider myself a leader because now I have a lot of preparation for what I can be doing, I see that people do what they are told to do without having to be behind them, they follow the steps of a leader and the most important thing is that I am turning other women into leaders, I help them to develop as leaders" (E22, 56 years old).

Theme "Motivations and Goals"

In this topic we find the codes about the goals and motivations that businesswomen in Mexico have. These were classified according to the origin of each one of them, such as: personal and family goals and motivations, professional goals, business goals, economic motivations, and work motivations. The families that are shown in Table 10 have the greatest impact on the development of leadership in these women.

One of the main families found in this theme is work motivation, as this determined the orientation that women have (towards the task or towards people). For this family, Mexican businesswomen have an orientation towards the pursuit of meeting objectives, but they also seek to have good relationships with employees. This means that women prefer a balance between the pursuit of objectives and relationships; there is no preference for either. As an example, we have the following comment: "I prefer both, because if you want to improve you have to give employees a chance" (E1, 62 years old). Another representative

example of this situation is the following: "Both, employees help you a lot to achieve the objectives of the company, you have to look for a win-win situation" (E2, 46 years old).

Table 10. Theme "motivation and goals"

Theme	Families	Code	Freq.
Motivations and goals	Business goal	Business growth goal	14
		Customer satisfaction goal	3
	Personal and family goal	Children as personal goal	8
		Livelihood goal	8
		Opportunities for family as goal	7
		Realize as an entrepreneur as a personal goal	7
	Professional goal	Company's positioning goal	4
		Improvement as a professional goal	3
		Surpass as a personal goal	2
	Economic motivation	Grow family business as impulse	8
		Profit boost	5
		Own money	3
	Work motivation	Pursuit of objectives and good relations as a preference (the 2))	12
	Personal motivation	Pursuit of self-sustainability (self-sufficient)	13
		Family as impulse	11
		Personal growth as impulse	11

Another of the families represented in this theme is that of personal motivation. It was observed that the women interviewed started in the business in search of self-sufficiency, which means that they want to generate their own income, not depend on their husband's salary or on what their parents provide. This part is very important because it is the first step towards women's empowerment, as discussed in previous topics. It is considered that starting to contribute to the family or having their own money is a triggering factor in this search for independence, empowerment and, as a consequence, security and self-confidence. This is exemplified by the following comment: "I work because work exalts us as women and makes us feel independent, strong and secure" (E25, 58 years old). Another opinion on this subject is the following: "When I started with the business, I began to feel strong, secure, independent and I want to continue feeling this way" (E20, 55 years old).

Among the main personal motivations are the children and the improvement of opportunities for the family. There is a very important link between the support these women receive from their families and the fact that this family factor turns out to be their main motivation. After analyzing this, it is observed that the family plays a very important role not only in the development of leadership, but in the development of all aspects of women (it is support and motivation at the same time). As an example, we have these opinions: "One of my personal goals is to support my son's career, to support him until he finishes" (E11, 61 years old); "My personal goals are to have stability in all senses, to achieve tranquility in my

family, especially my daughters', to give them the opportunities that I did not have at their age" (E7, 33 years old).

Theme "Challenges"

As part of this topic, the challenges that Mexican businesswomen face, both in their organizations and in their personal lives, were discussed. These challenges allow them to evaluate themselves to see how they are doing and learn how to overcome the obstacles they face every day. Many of the challenges that were presented were when starting the business, which is the most difficult part of some of them because they had to break paradigms and schemes about the role that a woman should have. On this topic, as can see in Table 11, the challenges were divided into three families: economic challenges, business challenges, and personal challenges.

Table 11. Theme "challenges"

Theme	Families	Code	Freq.
Challenges	Economic challenges	Lack of financial resources	8
		Lack of money as challenge	5
	Business challenges	Customer challenge	12
		Growth challenge	11
		Lack of employees as challenge	9
	Personal challenges	Learning over time	27
		Traditional roles are not obstacles for female leadership	21
		No obstacles	17

The biggest economic challenge was the lack of resources, in this case the lack of money, both at first and now. This lack of resources led them to request support, most of which came from their families, and only a very small proportion of them requested bank loans or support from the government. The following response provides an example of this difficulty in the organizations: "Currently I have been in the business for 45 years, but instead of growing, the business began to decline, so we no longer had income, so we had to ask for support from the family" (E8, 58 years old).

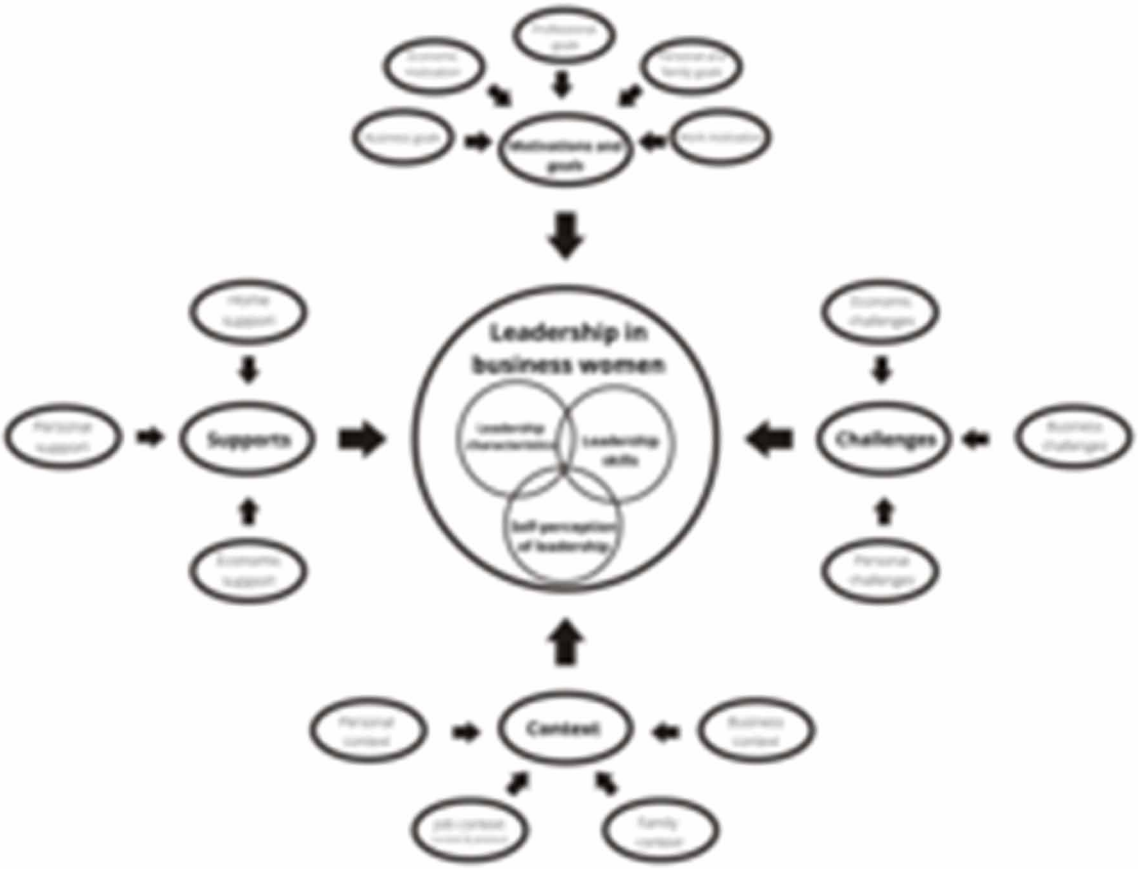
One of the personal challenges in this context is constant learning. The interviewees are aware that they must stay at the forefront of knowledge, but it is also a challenge for them because sometimes combining so many roles and also being in constant learning adds much more pressure to the lives of these women. One of the interviewees commented that "Mainly what I had to learn, and what I am still learning, are management issues, it is what has cost me the most work in my business" (E15, 48 years old). Another example is: "I have several challenges, to continue learning everything I have to learn, to have different work roles, to learn from the bottom up" (E13, 23 years old).

Finally, the presence of a code that has a great impact on the self- perception of women and their challenges was observed: women's traditional roles are not an obstacle to the development of leadership. This code is of utmost importance because it allows us to see a feminine posture of self-confidence and

self-assurance; even though they identify that they have challenges ahead of them, they don´t consider their condition as women and the roles imposed by society as a challenge to be considered in their development. There are some examples of this position, the most significant of which are presented below: "I believe that no, that roles are not an obstacle or a challenge, rather I believe that it is the desire that each person has to get ahead and believe that everything can be achieved with efforts and sacrifices, I believe that everything can be achieved as long as we put our minds to it, I believe that we can" (E14, 29 years old); "I feel that traditional roles as such are not an obstacle, you can simply see that now in labor development, we have a greater presence in this area and we achieve both things" (E20, 55 years old); "It is that the women themselves put the roles, we are our own thoughts and I do not consider them to be obstacles or challenges, the women themselves create these limitations" (E25, 58 years old).

Based on this, a grounded theory model was developed to explain the businesswomen phenomenon.

Figure 1. Grounded theory model



As shown in Figure 1, the Mexican businesswomen leadership is made up of a mixture of three factors that can be defined as: their self-perception of their leadership, their skills, and the characteristics they have and should develop.

Within these three components of female business leadership, the women demonstrated that in order to succeed and develop, one must have passion and demonstrate it in each of the activities carried out in the organization and outside of it. They consider themselves passionate, they do their jobs with pleasure and as a consequence, they see no problem in sacrificing personal time to invest it in their business. This passion is a factor of impact because it is contagious to workers, which will allow them to share the vision and organizational goals.

Another of these components is the vanguard, emphasizing the knowledge they must have. Over time, these women have found that not being up to date with the required knowledge (for this study it would be knowledge in terms of administrative, accounting, and technological issues) is a weakness and can cause the company to fail or have difficult situations.

In addition to passion and leadership, the women interviewed commented that there are basic characteristics that allow them to exercise effective leadership, such as: being responsible, having a strong character, having confidence in oneself and in others, having empathy and always seeking personal development as well as that of the workers.

Trust is basic because it allows building a self-image of security and seeks to permeate among employees and can generate empowerment among them. When employees perceive a trustworthy boss, they tend to develop an atmosphere of security and support, which allows them to take the initiative in decision making and innovate in their way of working, as they are aware that their bosses will support them and will be there to help them through these processes.

One of the most relevant points in this model is the fact that, although the literature review established that women were exclusively interested in maintaining good employee relations and employee development when exercising leadership, this is refuted by the emerging categories in which it is shown that the women interviewed seek a balance between having good relations with employees, but also achieving business objectives. This means that the beliefs held about female business leadership are erroneous.

This female entrepreneurial leadership is influenced by the context in which it is developed, the support women receive, the challenges they must face during their development and the goals and motivations they have.

Among the factors of great importance for this leadership is support. By support we mean all the help these women receive from their families, including the economic support they may receive from their husbands (if they are married). This "support" factor is considered to be the trigger for women to develop as leaders and entrepreneurs. It could be thought that in situations where this factor is not present, the development of effective leadership will be null or too complicated.

This family aspect can be considered as the beginning and the goal of being in charge of a business, since it was expressed that the main motivation they have is to provide better opportunities for their family, support their children and the household economy.

Within the family aspect, it was observed that most of the women, in addition to having family support, maintain excellent relationships with their families, who show great pride in them for being businesswomen and this promotes women to develop the confidence required by the leaders, and therefore, another important factor in this grounded theory model arises female empowerment.

In the words of the women interviewed, female empowerment arises in them when they become self-sufficient (the reason for starting the business), they surpass themselves, they seek and achieve their preparation, they notice that their business grows, and they see professional and personal improvement. In addition to this, they consider that women currently have a greater presence in organizations.

A very important aspect is that within their context they consider that the traditional roles with which some of them grew up are not a challenge for the development of their leadership, since they consider that they themselves are the ones who must make their way in all aspects and improve themselves day by day.

FUTURE RESEARCH DIRECTIONS

An aspect that should be analyzed in depth in future research is the factor of female empowerment, which is mentioned as a result of the leadership shown by women, since they consider that being leaders in their context and having the appropriate characteristics empowers and allows them develop subordinates to become leaders and this empowerment flows from person to person. It will be necessary to analyze this important impact factor, to identify the strategies that each of the women uses to reach empowerment.

In addition to this, it is recommended to continue with research in other Latin American countries, to know what the perception of women is and if, because they have a culture like of Mexico, there are factors in common. It is considered that the study of female leadership has a great future, since great efforts are made by governments to improve the conditions of women, not only in terms of the organizational aspect.

Together with these government efforts and research of this type, realistic strategies can be generated so that each woman is in charge of her own development and that of future generations.

CONCLUSION

The female leadership model in the context in which the study was conducted breaks the traditional schemes where it was believed that women preferred behaviors oriented towards transformational leadership and a purely relational orientation.

These results allow us to establish that women's leadership style is a combined style (relationships and tasks), where it is observed that women do consider themselves leaders (due to the characteristics and skills they have) and that the context significantly influences the development of this leadership, with important factors such as family support, motivation due to the family and economic challenges.

In addition, this model defines the leadership style, the perception of leadership, and the importance and influence of context in the development of businesswomen's leadership in Mexico.

It is concluded that women have been able to exploit their abilities to achieve what can be called: leading from the feminine. This means that they can exercise effective leadership, taking advantage of the characteristics they have simply because they are women and not trying to copy or appropriate male leadership, which, although effective in certain cases, is no longer practical for women and could generate more problems with employees than they currently have.

In addition, it was determined that women have a leadership style where they seek to have good communication with employees, take into account their needs and show a high degree of maturity (measured in the establishment of realistic and achievable goals). This result is validated with the families of characteristics, skills, self-perception, context, goals, and challenges; since women consider that they have characteristics such as communication and trust that make them leaders, but, in addition, it was observed that they have good relationships with their subordinates, they make decisions together and set realistic goals that will be achieved with the help of employees.

The results of this research suggest that women's leadership has been mistakenly perceived. For many decades it has been thought that women as leaders are weak and fragile, that they must be cared for and protected, while they manage and lead their companies by taking advantage of their strengths and, above all, by taking advantage of the strengths of the people around them. It was shown that women seek to create a chain of empowerment, which allows them not only to reach a sales or profit goal, but also to develop other women and empower them as leaders. It can be concluded that women seek to develop other women, which will allow in the future to have a large number of women leaders managing their own companies and forging a much more promising and equitable future for the next generations of women.

It is also observed that women have their family as their main motivation and support, an aspect of the highest importance for the development of effective leadership of businesswomen. Therefore, it is recommended that the importance of family in other contexts (perhaps in women leaders of organizations other than their own) be analyzed in detail to validate the impact of this factor in their leadership.

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Chapter 24
Social Media and Social Distance:
Revisiting the Restaurant Business Model

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ABSTRACT

Social media and social distance (proxied by online food delivery), the latter compounded by the increased disruption introduced by COVID-19, are radically impacting the way restaurants do business. Such a claim, fairly apparent to the consumer, arguably remains underexplored in the business model literature and begs for supporting evidence. This research aims to bridge such a gap by conducting an empirical study on the effects of social media and social distance on restaurant performance, feeding a revised business model canvas. The findings, as per the outputs of hierarchical and stepwise regressions, suggest that both social media and social distance (online food delivery) have a significantly favorable influence on restaurant performance, shaping a digitally-boosted restaurant business model canvas.

INTRODUCTION

Online food delivery platforms are the ultimate case of social distance, as deliveries increasingly coexist with –and eventually replace- sit-in dining across restaurants worldwide, all compounded by the COVID-19 pandemic. Social media has been a powerful enabler behind this phenomenon. Many restaurants are incorporating these technologies into their business model, yet largely as a 'me-too' response to rivals and the overall industry shift, without further reflection on their impact on performance and long-term competitiveness.

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Kim et al. (2016) and Morris et al. (2013), concur that restaurants have typically shown very limited innovation on their business model over time. Online reviews, minimum order price, restaurant ranking, overall rating, delivery fees, and an excellence certificate, proved to be significant variables that affect restaurant performance.

Online to offline services have gained remarkable popularity in recent years by leveraging the benefits of online convenience to the real offline world, particularly so in the restaurant business. Roh & Park (2019) argue that online food delivery platforms (OFDPs) have become extraordinarily popular largely as a result of the continuous progress in information and communication technologies, and the massive adoption of social media, casting the way people buy and consume. Troise et al. (2020) add that OFDPs have benefited from the exponential growth in population density in most urban locations. A noteworthy side-effect of this phenomenon, also addressed in the present chapter, is the emergence of virtual, 'ghost' restaurants, eliminating dine-in operations, i.e. removing table service and optimizing kitchen space, increasing efficiency by offering delivery-only services. Such a fundamental business model shift is likely to allow restaurants to compete in urban hot-spots where the rent per square meter is overrated.

Kim et al. (2015, 2016) argue that consumers largely rely on online sources to retrieve product and service information potentially feeding their purchases, weighing in prices and eventually building trust. Even if populating information in online channels may drive marginal revenues, Lee et al. (2019) warned against information overload, likely to result in confusion and customer dissatisfaction.

Zhang et al. (2019) point at the significant impact of logistics, online reviews, electronic word of mouth (e-WOM), and price over online purchase intentions. Consumers typically search for information, user opinions, and ratings before buying on OFDPs. Yet the core value proposition of such platforms remains getting the meal to the consumer's doorstep, so factors associated with delivery, such as delivery time and food reliability, are central to consumers' purchase intention.

When it comes to social media, Mexico goes past the basics. Data from Statista (2019) suggest that in 2021, more than half of the Mexican population would use social media, with more than 60 percent of users already keeping profiles on at least four social media platforms. The integration of payment solutions and online shopping into those platforms is crucial to monetizing social networks. Profiting from online channels has not necessarily been intuitive for restaurants, as their traditional business model is built on dine-in revenues.

Restaurants increasingly need to create content for platforms such as Instagram, Facebook or TripAdvisor, so as to reach out to users and increase visibility. Online reviews have become the most influential tool shaping final purchase decisions. According to Banerjee & Chua (2016), TripAdvisor evolved into the world's most popular online data source in the hospitality industry, with more than six million users visiting the social platform thirty times per month (ibid).

Platforms rising from the shared economy, such as the above-mentioned TripAdvisor and Instagram, along with UberEATS, Rappi, and Doordash, to name a few, have arguably changed how restaurants do business. They have disrupted the industry, so restaurants that want to remain competitive are likely to revise their business model. This empirical study aims to unveil the impact on and potential transformation of the Business Model Canvas (BMC) for restaurants.

Osterwalder and Pigneur (2010) introduced the BMC as a tool to drive business strategy and operations, on the back of nine building blocks that spell out how an organization creates, delivers and captures value. The nine building blocks are key activities, value proposition, key partnerships, customer segments, revenue streams, distribution channels, customer relationships, key resources, and cost structure.

Indrawan et al. (2016) illustrate the traditional business model of restaurants by using the canvas proposed by Osterwalder and Pigneur (2010). The dominant business model of restaurants is developed around serving a niche market of customers, creating value to users by a mix of price and quality. The distribution channel has largely been the conventional dine-in and table service. The model generates customer relationships in the restaurant's physical space, and relies on a single revenue stream, out of the key resource, i.e. food. The core activity is transforming raw materials into dishes; their key partnerships are with food suppliers, and the main cost drivers are wages and eventually the lease.

Despite the apparent relevance of OFDPs and social media for this industry, the literature has largely ignored the link between these two and a potential ensuing transformation of the traditional restaurant business model.

Such research gap is addressed by the main question driving this study, articulated as follows:

How do online food delivery platforms and social media impact restaurant performance and by extension its business model?

This research has been conducted on a purposive sample of restaurants in Mexico City, through a multiple case study design. The sample was analyzed at different sales levels, so as to identify what factors impact the most on high- and low-performance restaurants. Focusing on a single industry, in a single setting, serves to control for external factors, and provides valuable insights on the business model challenges faced by the industry in an emerging market context.

LITERATURE REVIEW

Kim et al. (2016) argue that social media has been playing an essential role in how companies perform, operate, and communicate information that feeds customer choices, even for traditional industries with a largely off-line value chain. Online social media are probably the most reliable channel to access relevant and updated information on any given business. Social media allow users to communicate and share content without a physical space, an attribute that gained even more prominence in a COVID-19 setting -likely to remain in the so-called 'new normal' emerging from the pandemic.

In the restaurant industry, social media are shaping competition due to the extensive information posted on platforms such as Instagram, Facebook, and TripAdvisor, which have emerged as infomediaries of choice for the connected consumer. Yet there is arguably significant untapped value those platforms may deliver for restaurants. Munar & Jacobsen (2014) posited that industries use social media to understand customers' desires and needs, translating them into improved or extended products and services. Restaurants are largely missing out on these opportunities.

The term 'business model' became mainstream in the 90s to describe new revenue models for e-commerce and *dot.com* new ventures, and has been eventually extended to all industries and companies (Morris, 2013). Amit & Zott (2010) argued that the business model is likely to account for variations in performance across firms. The business model describes how the company intends to produce value, manufacture the product or service, and deliver it, so as to convert revenues into profits. Business models are not set in stone, nor the strategies fed by the model. Both the strategic choices and the underlying business model should be regularly revised, in order to sustain competitive advantage. Adjustments are

at times marginal, yet occasionally the nature of change is more disruptive, as that brought about to the restaurant industry by social media platforms.

As noted by Indrawan et al. (2016), the traditional business model of restaurants combines serving a niche market of customers, creating value by price and quality, and delivering that value through a single distribution channel, namely the conventional dine-in and table service. The only revenue stream is generated in the restaurant's physical space. As summarized in the previous section, the model's key activity is transforming raw materials into main dishes; key partnerships are with food suppliers, and the cost structure is all the staff plus the lease. OFDPs and social media have emerged as model disruptors yet relevant value drivers for restaurants to diversify revenue streams and boost performance. Even if the impact of both OFDPs and social media on restaurants has been separately discussed in the literature (Roh & Park, 2019), there is arguably no study focusing on the link between the two, and the ensuing business model transformation, which account for the research gap hereby addressed.

Hossain & Adelaja (2000) already suggested at the turn of the century that restaurants' food distribution and marketing were on a radical shift, from traditional purchasing methods to online systems, such as phone ordering, online shopping, home delivery, drive-through, and pick-up. Ha & Lee (2018) added that the increase in online food ordering has prompted restaurants to develop IT capabilities, upgrading their websites and mobile apps to meet OFDPs and social media requirements.

Zhang et al. (2019) defined online food delivery platforms as a combination of offline products and online promotions. Transactions are performed through the Internet, a low-cost means to connect merchants with customers, breaking geographical boundaries. A closer look at the essence of OFDPs' business model unveils a two-step value capturing process, first attracting a large number of restaurants to advertise on the platform, and then inviting users of the OFDP to order products from those affiliated food providers. The platform can successfully develop in the long run if there is a connection between the two steps. Cho & Son (2019) point out that restaurants that add online services are more likely to stay competitive, with an increase in overall revenues between 5% and 35%.

Restaurants may also be confronted with potential disadvantages, notably the lack of personal interaction with the consumer, as such interface is taken over by the OFDP, and the resistance to order online, particularly from consumers not familiar with the technology (Goh et al., 2019).

The literature on OFDPs mainly focuses on consumer behavior and operational models. Cho & Son (2019), Roh & Park (2019), and Lee et al. (2017) studied consumer behavior in OFDPs, using surveys to assess consumers' preferences and perceptions. Zhang et al. (2019) look at the impact of OFDPs on restaurant performance and revenue, exploring the factors driving sales and profitability.

Three attributes are said to influence OFDP purchasing decision the most, namely logistics, electronic word of mouth (e-WOM), and price (Chen et al., 2018). Zhang et al. (2017) claim that the quantity, quality, and relevance of e-WOM all significantly affect the purchasing decision. Lee et al. (2019) in turn argue that the choice is contingent on logistics, distribution, price and quality. Yet the literature reviewed above shares one liability, which is that they are all single-factor studies, i.e. none combines factors to jointly assess their impact on performance. Only Zhang et al. (2019) addressed this gap and carried out a multivariate holistic study on the influence of OFDPs on restaurant performance, developing a model integrating price (broken down in starting price & delivery fees), WOM (number of reviews & overall ratings) and delivery (time of delivery, rate of time delivery & delivery personnel or not), to jointly infer their impact on performance (sales volume). Even if their study is bound to the Chinese catering market, their findings arguably have potential generalizability, to which our study may eventually contribute, by following their model in our inferential analysis.

Multiple studies look at the impact of online reviews on the hospitality industry. Dellarocas et al. (2007) focus on the total quantity of reviews and their influence on performance. Kim et al. (2016) claim that responses to negative online reviews give the restaurant visibility. Phillips et al. (2017) point at the impact of positive reviews on customers' perception of the product or service. Sparks et al. (2013) measure variances in performance based on a set of reviews, positive and negative, and their correlation. The interplay of online reviews and performance is assessed through various lenses, yet most studies draw conclusions on the hospitality industry at large, with limited attention to the restaurant business. Only Kim et al. (2016) attempt to fill in that gap by looking at the effect of social media on the value of a sample of US restaurants.

Zhang et al. (2017) underline that using social media has become commonplace in all industries, highlighting the power of cyber channels to communicate with customers. Aichner & Jacob (2015) refer to the different online applications, such as video and photo sharing, blogs, social networking sites, online product or services reviews, and evaluation communities that could feed social media. Kim et al. (2016) argue that social media help the content generation process and information sharing by companies or individuals.

Social media is a preferred platform for customers seeking information about the product or service they intend to buy. Barreda et al. (2015) argue that online social media have a direct influence on brand awareness, brand position, customers purchasing decisions, and brand loyalty. Tajvidi & Karami (2021) add more supporting evidence, finding a positive relationship between social media use and hotel performance.

Siamagka et al. (2015) posit that online social media adoption creates vast networks between suppliers, customers, and businesses. However, small and medium-sized businesses (SMEs) tend to underestimate the value of networking. Zhang et al. (2017) point at the selection of social media and its barriers and benefits to SMEs, and argue for a positive relationship between online social media usage and firm performance in the hospitality industry.

For restaurant managers, the value of social media is arguably centered on customers' online reviews, comments and evaluations, so as to gain insight on customer sentiment as a tool to assess performance. Kim et al. (2016) provide evidence on how a high level of engagement on social media could help a restaurant increase brand awareness and communicate new products or services. Yet the nature of social media is by definition double-edged, as negative reviews may lead to significant reputational damage (Jacobowitz, 2020). Litvin et al. (2008) suggest that electronic word of mouth (eWOM) generated by customers on social media is a powerful marketing vehicle for small and medium restaurants that cannot afford significant traditional marketing expenses, potentially affecting sales growth, profitability, and branding. Bouwman et al. (2018) observe a positive association between social media implementation and financial performance across industries, including the restaurant industry. All firms assessed in their study went through a process of business model innovation, and adopted social media and digital sales channels to increase performance, rendering higher performance (ibid).

All in all, there is agreement in the literature that social media play a relevant role in shaping performance in the restaurant industry, largely leading to improved outcomes. Yet explicitly tracing such effect back to the driver in the business model canvas arguably remains a pending task, more so in an emerging market context. Contributing to filling in such gap makes for the expected contribution of this study.

Business models have been attracting considerable attention by both practitioners and academics. New technologies, particularly e-commerce, apps, and social media, have shaped the emergence of new business models that explain how companies can create and capture value. Chesbrough & Rosenbloom

(2002) define the business model as a composition of diverse variables, including cost structure, value chain activities, value proposition, profit potential, value network, market segment, and competitive strategy. Casadesus-Masanell & Ricart (2010) come back to the link between business model and strategy, arguing that the former should set the boundaries of strategic choices and their translation into actions, in the quest for competitive advantage.

As noted, Kim et al. (2015) and Morris et al. (2013) concur that restaurants show a very low diversification of business models and business activities compared to other industries, implying that restaurant value chains tend to look alike -receiving raw materials from suppliers, creating final products (dishes), and selling them to its clients. This is potentially detrimental in terms of competitive dynamics yet creates an opportunity to analyze transformations under a relatively unchanged business model over time. The traditional restaurant business model canvas, adapted from Indarwan et al. (2016), is presented in Table 1.

Table 1. Restaurant business model canvas

<table>
<tr>
<td rowspan="2">Key Partners
- Food and beverage suppliers
- Local suppliers for raw materials
- Partnership with the banking industry
- Restaurant architects</td>
<td>Key Activities
- Standardization of the raw materials
- Quality control of food
- Food preparation standardization
- Administrative operations</td>
<td rowspan="2">Value Propositions
- Daily fresh food
- Friendly service
- Great value for price and quality
- Food quality
- Service quality</td>
<td>Customer Relationships
- In-person experience
- Friendly and quick service
- The innovation of food and beverage
- Convenience</td>
<td rowspan="2">Customer Segments
- Seniors
- Teenagers
- Young adults
- Adults</td>
</tr>
<tr>
<td>Key Resources
- Food recipes
- Human resources
- The intellectual property of the restaurant brand
- Cooking equipment</td>
<td>Channels
- Restaurant
- Word of mouth
- Traditional advertising (TV, print, and billboards)</td>
</tr>
<tr>
<td colspan="3">Cost Structure
- Real estate costs
- Equipment
- Insurance
- Labor costs
- Marketing costs</td>
<td colspan="2">Revenue Streams
- Franchises fees
- On spot restaurant revenue</td>
</tr>
</table>

Source: Own elaboration adapted from Indarwan et al., 2016

The business model canvas (BMC) has been a debated topic in the management and entrepreneurship literature, yet there is ample consensus that there is no 'one-size-fits-all' approach to follow, i.e. no such thing as a best business model fitting all companies, even within the same industry (Magretta, 2002; Amit & Zott, 2010; Osterwalder & Pigneur, 2010, Teece & Linden, 2017). The BMC is widely used by start-ups as they shape the new venture, as well as a road map to track the progress of all pillars, resulting in a dynamic tool that changes over time (Teece, 2018). Such dynamic attribute is the underlying assumption this research builds on, as the restaurant BMC is revisited upon the impact of social media and OFDPs.

While the business model canvas creates a dynamic map of nine blocks accounting for the company's core activities, it has not been applied before to assess potential disruptions in the restaurant industry.

Based on the literature reviewed above, the following hypotheses are developed:

H1: If social media (do not) impact restaurant financial performance, then the traditional restaurant BMC is (not) exposed to change.

H2: If online food delivery platforms (do not) impact restaurant financial performance, then the traditional restaurant BMC is (not) exposed to change.

The following section discusses the chosen methodology to carry out the analysis.

METHODOLOGY

Inferential analysis is conducted through a combination of hierarchical and stepwise regressions, to explore how social media and OFDPs impact on restaurant performance, and in turn feed a revised, digitally-boosted business model canvas.

Mexico City's restaurant landscape is experiencing the disruptive change hereby assessed, with an exponential growth of OFDPs following widespread use of social media. Data from Statista (2020) report revenue from OFDPs in Mexico amounting to USD 1.800 million, with an estimated CAGR for the period 2020-24 of 11.4%, reaching USD 2.826 million by 2024. The largest segment under this category is *Restaurant-to-Consumer*, with a turnover of $1.077 million in 2020, representing 59 percent of the online food delivery market's sales. Mexico City, the country's capital, is a gastronomic melting pot, featuring more than 15.000 restaurants, unquestionably leading nationwide in number and variety of outlets (National Restaurant Chamber, 2020). The city is home to more than 20 million inhabitants that increasingly rely on OFDPs, more so in the prevailing COVID-19, bound by social distancing and reduced sit-in capacity as per government regulations. The authors relied on the National Restaurant Chamber to collect the data following purposive sampling.

The study builds on three complementary components. The first model addresses the impact of online social media on restaurant performance, applying Kim et al.'s (2016) to the sampled units. The second model measures the impact of OFDPs on restaurant performance, following Zhang et al. (2019). The third and final step aims to reflect the impact of online social media and OFDPs on the traditional restaurant business model canvas, by using Cavalcante et al. (2011) and Indarwan et al. (2016), and eventually develop a revised restaurant business model.

• Sample and Data Collection

A total of 16 independent restaurants operating in Mexico City, accounting for a diverse mix of size, turnover and location, were identified and approached, with the support of the National Restaurant Chamber. Data inputs were collected from the top management of the restaurants and from the social media and online food delivery platforms. Table 2 summarizes relevant features of the sampled restaurants.

Primary data from internal operational metrics were collected through structured interviews with senior managers, under strict confidentiality agreements. Secondary data were sourced from all relevant online social media sites providing information and an interface with the restaurant industry, such as Google, TripAdvisor, Facebook and Yelp, among others. These sites typically rate attributes like price, food quality, atmosphere, service, online reviews and comparative rankings for all restaurants in the sample. Data for OFDPs were provided by UberEats, in coordination with the senior management from the selected restaurants. UberEats has been by far the dominant food delivery service in Mexico City

Table 2. Sampled restaurants – Key features

Restaurant	Type of cuisine	Town	Capacity (Number of seats)	Annual Sales (Million USD)	OFDP year of adoption	Social media introduction	Certification of excellence
A	Mexican	Benito Juárez	315	4.5	2016	2012	YES
B	Italian	Cuauhtémoc	211	3.2	2016	2013	NO
C	Japanese	Coyoacán	214	2.2	2016	2012	NO
D	American	Cuajimalpa	207	3.6	2016	2012	NO
E	Mexican	Narvarte	309	4.1	2016	2013	YES
F	Mexican	Álvaro Obregón	117	1.2	2016	2013	NO
G	American	Tlalpan	350	4.2	2016	2013	YES
H	International	Polanco	127	3.4	2016	2012	YES
I	International	Miguel Hidalgo	240	3.2	2016	2013	NO
J	Italian	Cuajimalpa	356	4.3	2016	2013	YES
K	French	Iztacalco	149	3.2	2016	2013	NO
L	International	Miguel Hidalgo	90	2.5	2016	2012	YES
M	Mexican	Iztapalapa	79	1.9	2016	2013	NO
N	Italian	Gustavo A. Madero	99	1.8	2016	2012	NO
O	International	Coyoacán	267	3.9	2016	2012	YES
P	French	Álvaro Obregón	249	3.6	2016	2012	YES

Source: Own elaboration

since its introduction in 2016, and the most active platform, with the largest share of business with the sampled restaurants. Data included price, time of delivery, delivery fees, rate of timely delivery, overall rating, e-WOM, and the total number of reviews. Customers arguably consider three main aspects before placing an online food delivery order on a platform: electronic word of mouth (e-WOM), logistics, and price. According to historical delivery data, the platform computes the expected delivery time and the delivery fee. The OFDP outsources trained delivery personnel, who by and large meets delivery standards, with the most relevant metrics being keeping the food's order in good condition and arriving on time. UberEats implements a five-star rating system, making it easier to evaluate customer overall satisfaction. The platform ensures genuine online reviews by only allowing users to place a review after receiving their orders. The underlying logic is that the better a restaurant performs, the better reviews it will receive, enhancing e-WOM.

After computing both models -for social media and OFDPs-, only the variables that have a statistically significant impact on restaurant performance are considered for the business model canvas (re) assessment. The variables that significantly impact restaurant performance for social media are total reviews, restaurant ranking, guests per labor hour, food, overall rating, and excellence certification. The variables for OFDPs that have a statiscally significant impact on restaurant performance are the time to delivery, minimum order price, delivery fees, and the number of reviews. In order to categorize the variables, Cavalcante et al. (2011) framework model was chosen to classify the type of change. Indarwan

et al. (2016) traditional business model canvas is applied as a base to analyze the potential change on the dimensions of the BMC.

• Data Analysis

Social Media

The study defines one moderating variable, five control variables, three independent variables, and three dependent variables. All were measured as single-item scales to examine the association to restaurant performance. The three *independent variables* are *guests per labor hours*, *restaurant ranking*, and the *total number of reviews*, which were computed as continuous variables. Guests per labor hours reflect the restaurant's operational efficiency, which is computed as the total guests divided by the server's total labor hours. Restaurant ranking is defined as a percentile measured by dividing each restaurant's position by the number of restaurants in its online category –e.g. the lower the percentile, the higher the ranking within a specific category of TripAdvisor. The total number of online reviews is computed by the sum of the reviews in the four leading online social media platforms, namely Facebook, Google, TripAdvisor, and Yelp. All variables, metrics, and measurements are detailed in Table 3.

Table 3. Description of selected variables for social media

Variable	Variables	Data Source	Measures
Dependent	Sales	Restaurant top-management	Sum of all sales minus discounts, deductions, and allowances
Dependent	Total guests	Restaurant top-management	Sum of total guests attending a restaurant over a given period of time
Dependent	Average check	Restaurant top-management	Sales divided by total guests
Moderating	Certification of excellence	TripAdvisor	Binary, 1 if the restaurant has a certification, 0 otherwise
Control	Food	TripAdvisor	5-star Likert scale for food
Control	Service	TripAdvisor	5-star Likert scale for service
Control	Value	TripAdvisor	5-star Likert scale for value
Control	Atmosphere	TripAdvisor	5-star Likert scale for the atmosphere
Control	Overall rating	TripAdvisor	5-star Likert scale for rating
Independent	Total reviews	Google, Facebook, Yelp, TripAdvisor	Sum of the total number of reviews from the four leading platforms
Independent	Restaurant ranking	TripAdvisor	Percentile computed by dividing each restaurant position by the total number of restaurants in their online category
Independent	Guests per labor hour	Restaurant top-management	Total guests divided by server's total labor hours

Source: Own elaboration

Data inputs for the five *control variables* were obtained from TripAdvisor and measured by a 5-point Likert scale. These variables are *overall rating*, *food*, *value*, *service*, and *atmosphere*.

The three *dependent variables* for restaurant performance are *total guests*, *sales*, and *average check*. Total guests are the sum of total guests attending a restaurant over a given period. Sales are computed as all sales minus discounts, deductions, and allowances. The average check is measured by dividing sales by total guests. Natural logs of the final values of the three dependent variables for the multiple regression were computed, instead of the raw values, as natural logarithmic conversion results in direct interpretation and improved model fit. For the moderating variable, TripAdvisor grants a 'certification of excellence' to outstanding restaurants. The 'certification of excellence' was coded as a 0-1 binary.

Descriptive statistics were computed, followed by a Pearson correlation analysis to identify potential relationships between the dependent, control, and independent variables. Also, the variance inflation factor was calculated in order to discard any multicollinearity between variables. Then, a set of hierarchical multiple regressions were run on R, to examine the statistical significance of the impact of the independent, control, and moderating variables on the dependent variables.

Online Food Delivery Platforms

A stepwise regression analysis was run to measure the factors affecting total sales. The *dependent variable* input (*sales*) was provided by the top management of the sampled restaurants.

The *explanatory variables* are divided into three categories, namely *e-WOM*, *logistics*, and *price*. The price is that of a product shown on the OFDP. The only variable measured in percentage is the rate of timely delivery, which is computed by dividing the number of deliveries at a specific time by the total number of deliveries. This rate shows if a restaurant can deliver its order within its promised time. The time of delivery is measured as the average of historical delivery time records on the platform. The average of all reviews measures a restaurant's rating on a 5-point Likert scale. The total number of platform reviews is measured by the sum of all online reviews by actual consumers within a specific time frame. Details on all variables are presented in Table 4.

To assess the performance of high-sales restaurants and low-sales restaurants, an asymmetrical effect analysis is conducted to distinguish the crucial factors at the different sales levels. The sample was sorted into two groups divided by the average monthly sales, categorizing the top eight restaurants as high-sales, and the bottom eight as low-sales restaurants.

A Pearson correlation analysis was first conducted to identify potential relationships between the dependent and independent variables. Also, the variance inflation factor was computed to rule out eventual multicollinearity between variables. Then a stepwise regression was run on R, so as to eliminate the least significant variables on each iteration until the regression contained only statistically significant variables. The stepwise regression was run for each performance group (high-performance and low-performance restaurants) to identify any asymmetric effects of the influencing factors on the two groups.

Table 4. Definition of selected variables for the online food delivery platforms

Attributes	Variable	Definition
Price	Minimum Order Price	Lowest price for placing a delivery order
Price	Delivery Fee	The fee paid by the customer for the delivery service
Delivery	Time of Delivery	Average time for an order to arrive at the customer
Delivery	Ratio of Timely Delivery	Number of delivered orders within a time frame divided by all delivered orders
e-WOM	Number of Reviews	Total number of reviews of a restaurant on the platform
e-WOM	Overall Rating	Average restaurant rating graded by the consumer
Performance	Monthly Sales	Total number of orders sold on the platform by the restaurant

Source: Own elaboration

Business Model Canvas

The statistically significant variables that impact restaurant performance were categorized in the type of business model change developed by Cavalcante et al. (2011). The implementation of these variables into the restaurant's core processes was carefully evaluated to identify the type of change they would trigger to a traditional restaurant business model. The definitions relating to the type of business model change are shown in Table 5.

Table 5. Typology of business model change

Type of business model change	*Definitions*
Business Model Creation	Denotes the actual application of a business idea into a new business model
Business Model Extension	Emphasizes on adding new processes to the business model for improvement
Business Model Revision	Refers to overriding actual core processes and replacing them with new processes
Business Model Termination	Eradicating core processes

Source: Own elaboration

The variables were evaluated separately and classified according to the dimensions of the business model canvas, following Indarwan et al. (2016).

To assess the impact of the significant variables on the BMC, the type of business model change upon the statistically significant variables of social media and OFDPs was categorized. A similar categorization of the influence of these variables on the BMC dimensions was done. As a result, a new restaurant BMC, reflecting the impact of online social media and OFDPs, was developed.

RESULTS – DISCUSSION OF FINDINGS

Social Media

Descriptive statistics are summarized in Figure 1.

Figure 1. Descriptive statistics of the control, dependent, and independent variables
Source*: Own elaboration*

Variables	Mean	Min.	Max.	SD	Kurtosis	Skewness
Dependent Variables						
Sales	6.05	5.78	6.29	0.12	0.50	0.01
Total guests	4.77	4.46	4.95	0.11	0.10	0.39
Average check	20.88	17.77	30.19	2.21	1.94	1.74
Control Variables						
Food	3.86	3.14	4.19	0.25	2.84	1.61
Service	3.88	3.14	4.10	0.20	2.37	1.93
Value	3.50	2.86	4.10	0.38	1.59	0.31
Atmosphere	3.87	3.14	4.10	0.18	2.03	1.86
Overall rating	3.86	3.35	4.25	0.20	0.34	0.48
Independent Variables						
Total reviews	107.96	21.90	414.29	99.08	1.66	1.55
Restaurant ranking	0.10	0.01	0.33	0.08	0.55	1.01
Guests per labor hour	5.02	3.59	5.90	0.51	0.92	0.78

The correlation analysis is presented in Figure 2. Since the moderating variable is coded as binary, no correlation was computed. *Total reviews* are strongly positively correlated to *sales* (0.61, $p<0.01$), *total guests* (0.52, $p<0.01$), and *average check* (0.53, $p<0.01$). Out of the five control variables, *food* is the most related to *sales* (0.56, $p<0.01$), which illustrates how customer perceptions on the food have a positive impact on sales. On the other hand, *service* has a substantial impact on the three dependent variables -*sales* (0.40, $p<0.01$), *total guests* (0.23, $p<0.05$), and *average check* (0.23, $p<0.05$). The positive correlation between variables shows how the perception toward service has a substantial influence on sales, total guests, and average check. However, there was no significant correlation between *value* and *atmosphere* and the dependent variables, which are *average check*, *total guests*, and *sales*. Notably, customer perceptions of atmosphere and value do not seem to impact financial performance. The expected relationship between *restaurant performance* and *restaurant ranking* is negative, because the lower the ranking, the higher the financial performance. Thus, *restaurant ranking* values result in a strong negative correlation with *sales* (-0.46, $p<0.01$), *total guests* (-0.48, $p<0.01$), and *average check* (-0.47, $p<0.01$). Moreover, there is a strong positive correlation between *guests per labor hour* and the three dependent variables –*sales* (0.39, $p<0.05$), *total guests* (0.32, $p<0.05$), and *average check* (0.30, $p<0.05$), implying that the higher the personnel productivity, the higher the financial performance. Also,

the *overall rating* of a restaurant is positively correlated to *sales* (0.35, p<0.05), and *total guests* (0.43, p<0.05). In other words, the higher the customers' overall rating of a restaurant, the higher the sales.

Figure 2. Pearson correlation estimates. Social media
Source*: Own elaboration*

Variables	(V1)	(V2)	(V3)	(V4)	(V5)	(V6)	(V7)	(V8)	(V9)	(V10)	(V11)
Sales (V1)	1										
Total guests (V2)	0.70**	1									
Average check (V3)	0.39*	0.11	1								
Food (V4)	0.56**	0.14	-0.11	1							
Service (V5)	0.40**	0.23*	0.24*	0.28*	1						
Value (V6)	0.11	0.18	0.14	0.33*	0.38*	1					
Atmosphere (V7)	0.13	0.14	0.18	0.31*	0.29*	0.42**	1				
Overall rating (V8)	0.35*	0.43**	-0.19	0.34*	0.30*	0.29*	0.26*	1			
Total reviews (V9)	0.61**	0.52**	0.53**	0.22	0.06	0.17	0.19	0.18	1		
Restaurant ranking (V10)	-0.46**	-0.48**	-0.47**	-0.21	-0.35*	-0.39*	-0.39*	-0.12	-0.26*	1	
Guests per labor hour (V11)	0.39*	0.32*	0.30*	0.03	0.10	0.12	0.01	0.28*	-0.02	-0.29*	1

* Statistical significance at p<.05 level
** Statistical significance at p<.01 level

A hierarchical regression analysis was conducted to analyze the influence of the moderating variable and independent variables on financial performance. The results of the hierarchical regression are shown in Figure 3. The regression was composed of three steps: the first shows the primary impact of the independent and control variables on the dependent variables; then, the moderating variable, certification of excellence was coded into binary, to measure the impact of the certificate on financial performance; while in the third step, interaction terms were introduced –e.g. the multiplication of the independent variables times the moderating binary variable. The regressions with the three steps were conducted independently for the three dependent variables.

In order to check for multicollinearity, the variance inflation factor was computed, resulting in values between one and five, which are lower than the threshold value of 10 –fine even for the conservative VIF of 5-, rejecting multicollinearity. Normality was checked by plotting the residuals, the result was almost linear and normally distributed, implying that normal distribution and symmetry existed. Additionally, an analysis of the univariate normality was performed, by observing the kurtosis and skewness values. Univariate skewness was less than 1.93, and univariate kurtosis was less than 2.84, both much lower than the threshold of 5. Hence it was concluded that there was no violation of the normality assumption. Figure 3 shows the results for the hierarchical multiple regressions for the three independent variables.

In terms of model fit, the results were an R^2 of 0.27 for *sales*, 0.29, for *total guests*, and 0.25 for the *average check*, implying that the regression equation explains 27, 29, and 25 percent of the variation between the independent variables, control variables, and dependent variables. The F ratio values are of 6.97 for *sales*, 6.18 for *total guests*, and 4.75 for the *average check*, all significant at $p < 0.01$ confidence level. *Total reviews* strongly impacted all the dependent variables (*sales*, *total guests*, and *average check*) directly and positively, with standardized coefficient values of 0.25, 0.29, and 0.26 respectively, all with p-values less than 0.01. Thus, better *total reviews* do directly impact financial performance positively. The correlation between *sales* and *restaurant ranking* was negative; as expected, the lower the ranking, the higher the sales, (-0.26, p<0.01). Nevertheless, the *restaurant ranking* was not significantly associ-

ated with total guests and average check, resulting in coefficient values of -0.13 and -0.14, with $p>0.05$. Therefore, the higher the ranking, the higher the sales, total guests, and average check, with only sales being statistically significant. *Guests per labor hour* directly affected the three dependent variables, *sales* with a coefficient of 0.29, and $p<0.01$, total guests with 0.20 and $p<0.01$, and *average check* with 0.21 and $p<0.05$, implying that restaurants that manage to deliver a product or service with the most efficient use of labor, would achieve higher performance indicators. On the other hand, contrary to expectations, amongst all the control variables, only *food* was statistically significant, impacting restaurant performance with a coefficient value for *sales* of 0.23, at $p<0.01$, *total guests* of 0.18 at $p<0.01$, and *average check* 0.21 at $p<0.01$. Thus, *food quality* positively impacts all dependent variables, with *sales* being the most significant, suggesting that higher food quality leads to higher financial performance.

The *moderating variable certification of excellence* was then introduced to the regression –it had to be statistically significant to continue to the last step. It indeed had a positive impact on the three dependent variables, with *sales* with a value of 0.21, $p<0.01$, *total guests* (0.16, $p<0.05$), and *average check* (0.23, $p<0.01$). The R^2 had an increased predicting power by adding the moderating variable, with incrementing values of 0.028 for sales, 0.019 for total guests, and 0.019 for the average check, resulting in a better model fit than the first step, all with statistically significant values at $p<0.01$.

In the third step, three *interaction terms* were introduced to the regression (*total reviews times certification of excellence*, *restaurant ranking times certification of excellence*, and *guests per labor hour times certification of excellence*). Only one of the three interaction variables were significant for all three dependent variables. Total reviews times certification of excellence had the most significant values with coefficients of 0.27, $p<0.01$ for sales, 0.14, $p<0.05$ for total guests, and 0.30, $p<0.01$ for the average check. Thus, total reviews with a certificate of excellence have a more substantial positive impact on average check and sales over restaurants lacking such certificate. Nonetheless, restaurant ranking times certification of excellence and guest per labor hour times certification of excellence were not statistically significant predictors of financial performance.

Out of the eight independent variables, five have a statistically significant impact on restaurant performance, with overall predicting power of 35% for sales, 34% for total guests, and 31% for the average check. Thus, online social media influence restaurant performance, supporting hypothesis **H1**, and rejecting the null hypothesis of social media impact on performance. For this study, it is supported to predict that social media impact the traditional restaurant business model canvas' dimensions.

Online Food Delivery Platforms

In order to define whether the correlation between variables is significant and define if multicollinearity exists, a Pearson correlation analysis was conducted. Figure 4 shows the correlation results for the dependent variable and the six independent variables, in a matrix of seven variables. Monthly restaurant *sales* via the OFDP show a strong positive correlation with *minimum order price* (0.42, $p<0.01$), and the *number of reviews* (0.63, $p<0.01$). Thus, when the restaurant does not impose price restrictions on minimum orders, the higher the monthly sales are likely to be.

On the other hand, the number of restaurant reviews is the most crucial factor influencing sales. A negative correlation is shown between *sales* and *delivery fees* (-0.27, $p<0.05$), and *overall rating* (-0.29 $p<0.05$). O*verall rating* has a positive correlation with *delivery fees* (0.29, $p<0.05$), implying that restaurants with a high rating have higher delivery fees. The *overall rating* negatively correlates with the *time of delivery* (-0.25, $p<0.05$), meaning the higher the overall rating, the lower the delivery time. To

Figure 3. Hierarchical multiple regression outcomes for restaurant performance
Source*: Own elaboration*

Standardized coefficients (ß)

	Sales (ß)	Total guests (ß)	Average check (ß)
Step 1			
Independent Variables			
Total reviews	0.25** (-2.20)	0.29** (2.26)	0.26** (1.90)
Restaurant ranking	-0.26** (-2.30)	-0.13 (-0.95)	-0.14 (-0.77)
Guests per labor hour	0.29** (2.21)	0.20** (1.93)	0.21* (1.68)
Control Variables			
Food	0.23** (1.88)	0.18** (1.89)	0.25** (1.88)
Service	0.12 (1.45)	0.15 (1.52)	0.18 (1.55)
Value	0.06 (0.55)	0.05 (0.48)	0.02 (0.13)
Atmosphere	0.11 (1.16)	0.07 (0.64)	0.19 (1.32)
Overall rating	0.24** (2.14)	0.16* (1.56)	0.23** (1.86)
R2	0.27	0.29	0.25
F	6.97**	6.18**	4.75**
Step 2			
Independent Variables			
Total reviews	0.22** (1.95)	0.28** (2.29)	0.29** (2.02)
Restaurant ranking	-0.20** (-1.86)	-0.07 (-0.72)	-0.14 (1.53)
Guests per labor hour	0.19* (1.84)	0.24** (1.86)	0.17* (1.56)
Control Variables			
Food	0.12 (1.01)	0.20* (1.68)	0.20* (1.65)
Service	0.15 (1.14)	0.14 (0.87)	0.13 (1.47)
Value	0.05 (0.42)	0.01 (0.09)	0.03 (0.16)
Atmosphere	0.12 (0.84)	0.09 (0.51)	0.20 (1.38)
Overall rating	0.16 (1.35)	0.19* (1.66)	0.18* (1.59)
Certification of excellence	0.21** (2.15)	0.26** (1.90)	0.30** (2.34)
R2	0.028	0.019	0.019
Δ F	7.83**	7.62**	6.03**
Step 3			
Independent Variables			
Total reviews	0.20** (1.87)	0.24** (2.21)	0.19* (1.82)
Restaurant ranking	-0.24** (-1.90)	-0.13 (-1.52)	-0.19* (-1.58)
Guests per labor hour	0.17 (1.53)	0.19** (1.89)	0.13 (0.78)
Control Variables			
Food	0.18* (1.58)	0.16* (1.68)	0.02 (0.46)
Service	0.05 (0.33)	0.07 (0.42)	0.15 (0.84)
Value	0.03 (0.26)	0.10 (0.56)	0.01 (0.38)
Atmosphere	0.02 (0.22)	0.06 (0.36)	0.04 (0.51)
Overall rating	0.19* (1.84)	0.17* (1.85)	0.14 (0.81)
Moderating Effects			
Total reviews x Certification	0.27** (2.01)	0.14* (1.66)	0.30** (2.05)
Restaurant ranking x Certification	-0.13 (-1.39)	-0.13 (-1.52)	-0.14 (-0.82)
Guests per labor hour x Certification	0.11 (1.35)	0.10 (0.60)	0.18 (1.54)
R2	0.066	0.038	0.047
Δ F	6.93**	7.94**	4.42**

* Statistical significance at p<.05 level
** Statistical significance at p<.01 level

better understand these correlations, the time of delivery and delivery fees hold a robust negative correlation (-0.48, $p<0.01$), hence the lower the time of delivery, the higher the delivery fees, implying that restaurants with high overall ratings do not have higher delivery fees because of the rating, but because of shorter delivery times. The *timely delivery ratio* has a strong negative correlation with the *delivery time* (-0.83, $p<0.01$). This relationship is expected to be negative since the lower the ratio, the more orders are delivered on time.

Figure 4. Pearson correlation estimates. online food delivery platforms
Source*: Own elaboration*

Variables	(V1)	(V2)	(V3)	(V4)	(V5)	(V6)	(V7)
Minimum Order Price (V1)	1						
Delivery Fee (V2)	-0.15	1					
Time of Delivery (V3)	0.03	-0.48**	1				
Ratio of Timely Delivery (V4)	0.03	0.26*	-0.83**	1			
Number of Reviews (V5)	0.04	-0.20	0.11	0.01	1		
Overall Rating (V6)	0.01	0.29*	-0.25*	0.14	-0.17	1	
Monthly Sales (V7)	0.42**	-0.27*	0.16	-0.04	0.63**	-0.29*	1

* Statistical significance at p<.05 level
** Statistical significance at p<.01 level

A stepwise regression was then computed for all the restaurants in the sample. The model of Zhang et al. (2019) followed in this study, contains all opening variables, with the least significant consecutively eliminated from each iteration of the regression until all variables are statistically significant. The dependent variable in the regression is *monthly sales*. Eventually, four independent variables are left, namely *time of delivery*, *minimum order price*, *delivery fee*, and *number of reviews*. As shown in Figure 5, the variance inflation factors for the independent variables are between one and five, hence no multicollinearities. The stepwise regression results in a good model fit explanation, with an R^2 of 0.413. The F ratio value of 191.502 is significant at $p<0.01$. The coefficients for three independent variables are

Figure 5. Stepwise regression results for the complete sample
Source*: Own elaboration*

Variable	Coefficient	T-Value	VIF
Time of Delivery	1.974*	0.051	1.338
Minimum Order Price	6.147***	0.145	1.072
Delivery Fee	-2.714**	-0.074	1.399
Number of Reviews	25.570***	0.608	1.092
Adjusted R2	0.413		
F	191.502***		

Notes: *p<.1, **p<.05, ***p<.01

Figure 6. Stepwise regression results for high-performance restaurants
Source*: Own elaboration*

Variable	Coefficient	T-Value	VIF
Delivery Fee	-3.163***	-0.137	1.104
Number of Reviews	13.933***	0.590	1.056
Overall Rating	2.240**	0.097	1.098
Adjusted R2	0.36		
F	68.420***		

Notes: *p<.1, **p<.05, ***p<.01

positive and statistically significant, 1.974 for the time of delivery, 6.147 for minimum order price, and 25.570 for the number of reviews, all at $p<0.01$. Amongst the three positive coefficients, the *number of reviews* seems to be a crucial variable predicting monthly sales.

Delivery fee is also significant (-2.714, $p<0.05$), suggesting adverse effects on overall monthly sales.

The results above are consistent with those of Zhang et al. (2019). The higher the *number of reviews* and the lower the *delivery fee* will likely increase *monthly sales*. Those reviews represent previous experiences of consumers, if positive, that means customers' approval of the restaurant. For delivery fees, OFDP consumers are willing to pay less for the delivery service than the traditional restaurant server tip. Conversely, minimum order price and delivery time drive a restaurant's financial performance. The number of reviews has a significantly higher impact than the minimum order price and delivery time. The main reason for this phenomenon is arguably e-WOM.

The independent variables left out from the stepwise regression are the *ratio of timely delivery* and *overall rating*. The ratio of timely delivery is highly correlated with time of delivery, and the variance inflation factor was high, suggesting that these variables contained redundant data. The overall rating was not statistically significant, contrary to literature claiming it would be a relevant driver of financial performance (Kwok et al., 2015). The possible explanation is that the average rating of previous consumers already captures the overall rating in this study, meaning that if a restaurant has a low number of reviews, its overall rating is not significant –e.g. if the restaurant has only one review with a 5-star rating, the overall rating is 5 stars, but it is not enough for the consumer to make a purchase decision.

Out of the seven variables, four have a statistically significant impact on restaurant performance, with an overall predicting power of 41 percent. Thus, OFDPs impact restaurant performance, supporting hypothesis **H2** and rejecting the null hypothesis. It is therefore safe to claim that OFDPs would impact the traditional restaurant business model canvas' dimensions.

The asymmetric effects of influencing factors in high- and low-sales restaurants were computed. Figure 6 presents the regression results for restaurants with high sales on the OFDP. The *number of reviews* and *overall ratings* are good positive predictors of *monthly sales*. In contrast, high *delivery fees* harm *sales*. For high-sales restaurants, the impact of *delivery time* and *minimum order price* on *sales* are not significant, as previously noted for the complete sample of restaurants. While for the complete sample, the impact of the *overall rating* on *sales* is insignificant, for high-sales restaurants, it is a significant factor. Thus, *e-WOM*, which includes overall rating and number of reviews, is a significant factor that

sets high-performance restaurants apart from the competition. The stepwise regression model for high-performance restaurants resulted in a good model fit, with an R^2 of 0.36, and an F ratio of 68.420, with a significant p-value at $p<0.01$.

Figure 7 presents the regression results for low-performance restaurants. Similar to high-performers, the *number of reviews* has the most significant impact on *monthly sales*. Contrary to expectations, the coefficient of *delivery fee* was positive. The raw values for low-performance restaurant delivery fees were much dispersed, probably because low-sales restaurants do not pay enough attention to delivery fees. On the other hand, the *overall rating* coefficient was negative, implying that the lower the overall rating, the lower the *monthly sales*. For the *minimum order price* variable, the coefficient for low-performers was positive, i.e. the lower the minimum order price, the higher the monthly sales. The stepwise regression model for low-performance restaurants resulted in a good model fit, with an R^2 of 0.18 and an F ratio of 18.351, significant at $p<0.01$.

Figure 7. Stepwise regression results for low-performance restaurants
Source*: Own elaboration*

Variable	Coefficient	T-Value	VIF
Minimum Order Price	2.155**	0.101	1.121
Delivery Fee	2.321**	0.119	1.442
Number of Reviews	9.106***	0.421	1.082
Overall Rating	-2.328**	-0.119	3.381
Adjusted R2	0.180		
F	18.351***		

Notes: *p<.1, **p<.05, ***p<.01

For the complete sample, the variables that have a significant impact on *monthly sales* are the *number of reviews*, *minimum order price*, *time of delivery*, and *delivery fee*. Amongst the significant variables that have a positive impact on sales, the number of reviews is the variable with the highest coefficient, followed by minimum order price and time of delivery. The delivery fee resulted in a negative impact in the overall sample. The variables left out by the stepwise regression, lacking statistical significance for the complete sample, were the *ratio of timely delivery* and *overall rating*.

For the high-level sales restaurants, the variables that have a significant impact on *monthly sales* are *delivery fees*, the *number of reviews*, and *overall rating*. Amongst the significant variables resulting in positive impact, the number of reviews has a more critical influence, followed by overall rating. Same as in the overall sample, high-performance units reported a negative coefficient for delivery fee, while the number of reviews strongly impacts high-sales restaurants. Opposite to the complete sample, high-sales units' overall rating has a positive impact on sales. The stepwise regression for this group showed a lack of significance for minimum order price, time of delivery, and timely delivery ratio.

For the low-sales restaurants, the variables that have a significant impact on *monthly sales* are *minimum order price*, *delivery fee*, *number of reviews*, and *overall rating*. Similar to the previous regressions, the

number of reviews results in a higher coefficient that impacts sales on low-performance restaurants. The variables that resulted significant were the same as in the complete sample. A clear difference emerges between high-sales and low-sales units, implying that low-sales restaurants should put more emphasis on e-WOM and logistics.

Business Model Canvas

The results are presented in three steps. Firstly, the categorization of types of change that the variables reflect on the traditional business model are shown in Figure 8. On the ***social media*** dimension, *total reviews*, *restaurant ranking*, and *overall rating* are categorized as ***business model extension*** type of change. These variables are not new to restaurants, but they need to extend their processes to online social media.

Guests per labor hour and *food* were categorized as ***business model revision***. Guests per labor hour and food, for low-sales restaurants, are performance and quality indicators, so restaurants should improve these processes to unlock higher performance. Conversely, the *certification of excellence* awarded by TripAdvisor is categorized as a ***business model creation*** type of change. Half of the sampled restaurants did not have a certification of excellence, resulting in low-sales performance. The restaurants with a certification of excellence showed remarkable differences in revenues, total guests, and average check, compared to those that did not have the certificate.

Figure 8. Categorization of variables according to the type of business model change
Source*: Own elaboration*

Category	Variable	Type of Change
Social media	Total reviews	Business model extension
	Restaurant ranking	Business model extension
	Guests per labor hour	Business model revision
	Food	Business model revision
	Overall rating	Business model extension
	Certification of excellence	Business model creation
Online food delivery platforms	Time of delivery	Business model creation
	Minimum order price	Business model revision
	Delivery fees	Business model creation
	Number of reviews	Business model extension

Secondly, the impact the variables could have on the BMC dimensions was assessed. All variables have an impact on *key partners*, *value proposition*, and *revenue streams* dimensions. Online food delivery platforms and social media are new key partners that enhance the value proposition and generate new revenue streams. Managing OFDPs and social media are turning into core activities for restaurants that want to improve customer relationships, boost sales and diversify revenue.

Figure 9. Proposed digitally-boosted restaurant BMC
Source*: Own elaboration*

<table>
<tr>
<td rowspan="2">Key Partners
- Food and beverage suppliers
- Local suppliers for raw materials
- Partnership with the banking industry
- Restaurant architects
- Online food delivery platforms
- Online social media platforms
- TripAdvisor for excellence certification</td>
<td>Key Activities
- Standardization of the raw materials
- Quality control of food
- Food preparation standardization
- Administrative operations
- Online marketing and advertising
- Contemplate daily online reviews
- Look after the minimum order price
- Provide the best time and fees for food delivery
- Comply with the online excellence certificate</td>
<td rowspan="2">Value Propositions
- Daily fresh food
- Friendly service
- Great value for price and quality
- Food quality
- Service quality
- Professional food delivery
- Bring down physical restaurant barriers
- Assure excellence with a certification</td>
<td>Customer Relationships
- In-person experience
- Friendly and quick service
- The innovation of food and beverage
- Convenience
- Digital experience
- 24/7 inbox
- Enhanced future experiences based on past reviews
- Better overall service experience
- Fast delivery
- Quality service
- Enhanced relationships</td>
<td rowspan="2">Customer Segments
- Seniors
- Teenagers
- Young adults
- Adults
- New tech generations
- Convenience customers
- Customers looking for a certified restaurant</td>
</tr>
<tr>
<td>Key Resources
- Food recipes
- Human resources
- The intellectual property of the restaurant brand
- Cooking equipment
- Online consumer data
- Real-time consumer data
- Online customer feedback
- Comply with the certification of excellence
- Delivery fleet</td>
<td>Channels
- Restaurant
- Word of mouth
- Traditional advertising (TV, print, and billboards)
- Social media
- e-WOM
- Online advertising
- Online food delivery platforms
- Social media platforms
- TripAdvisor certification of excellence webpage</td>
</tr>
<tr>
<td colspan="3">Cost Structure
- Real estate costs
- Equipment
- Insurance
- Labor costs
- Marketing costs
- Online marketing costs
- Online food delivery platform fees
- Delivery fees
- Training personnel for the excellence certificate
- Food packaging for delivery
- Cost reduction of having a delivery fleet
- Optimizing guests per labor hour</td>
<td colspan="2">Revenue Streams
- Franchises fees
- On spot restaurant revenue
- Online social media revenue
- Online food delivery platforms
- Increased revenue because of social media presence
- Increase in total guests
- Increase in average check
- Revenue brought by the certification of excellence</td>
</tr>
</table>

Finally, the impact of social media and OFDPs is integrated into the BMC framework proposed by Osterwalder et al. (2010), combined with the traditional restaurant business model canvas developed by Indarwan et al. (2016), and merged into a consolidated, revised BMC. The resulting, digitally-boosted business model canvas proposition for restaurants, is presented in Figure 9.

IMPLICATIONS FOR THEORY AND PRACTICE

This research expects to contribute to the literature on business models, by reflecting on the disruptive changes brought about by social media and OFDPs in the way restaurants create, deliver and capture value. The prevailing COVID-19 scenario not only accelerated digitalization, but also prompted a radical redesign of location-centered business models, based on maximizing traffic to your premises, to an outreach-led business model, in which firms, such as restaurants, need to continuously find ways to reach out to clients wherever they are, de-locating resources and capabilities, and making social media and delivery platforms key partners going forward.

Theoretical Implications

Restaurants may wonder whether social media and OFDPs are friends or foes, yet either through cooperation or coopetition, they arguably need to align incentives and leverage on each other. When it comes to *social media*, the findings of this study suggest total reviews have a positively significant impact on all three dependent variables for financial performance, namely sales, average check, and total guests. These findings are consistent with prior literature, particularly the studies of Duan (2008), Ye et al. (2009), and Kim et al. (2015, 2016). Online reviews and rankings are powerful ways to bond past and future clients, building trust among them and with the restaurant, while shaping reputational value, an intangible very much connected to financial performance.

This research confirms the moderating role of a certification of excellence, in turn impacting financial performance. Restaurants with a certification of excellence are likely to see an increase in sales, average check, and total customers, eventually growing exponentially as more online reviews are released. This finding is in line with Kim et al. (2016) and Sparks (2013), who noticed a strong relationship between certifications and customer purchase decisions.

In the case of *OFDPs*, as with social media, the total number of reviews have a strong positive correlation with monthly sales, which supports previous studies of Ye et al. (2009), and Zhang et al. (2019). The more reviews are available, the more comprehensive information to attract future customers. Plus, as consumers tend to repeat positive experiences, more reviews are likely to lead to repeating orders.

Delivery fees have a strong negative impact on monthly sales, specifically for high-sales restaurants. By increasing the delivery fees on the OFDP, sales will likely decrease significantly. Price is one of the most important factors driving customer choice, so the increase in delivery fees would discourage price-sensitive users. Li et al. (2018) found similar results in customer-to-customer platforms. Similarly, Zhang et al. (2019) posited the adverse effect of high delivery fees on net sales of restaurants on OFDPs, consistent with the findings of this study.

The time of delivery does not seem to have much impact on consumer choice. When the total number of reviews is high, consumers would not mind a delayed delivery service. Zhang et al. (2019) found that the Chinese consumer does not mind it either when the e-WOM is high, in line with the results of our study. Therefore, in dealing with OFDPs, e-WOM is the most crucial factor and the basis for enduring success with cyber clients.

The statistically significant variables of OFDPs and social media are incorporated in a revised restaurant business model canvas. The fact that this study followed Kim et al. (2016) on social media impact on restaurant performance, and Zhang et al. (2019) on the influence of OFDPs, replicating their models

in our sampled restaurants in Mexico City, added validation to the current literature and provided more solid grounds for further generalization.

The choice to follow Cavalcante et al. (2011) resulted in an adequate tool to categorize the type of business model change these variables can trigger during implementation. Another contribution to theory could be argued from us applying this framework, as there was no evidence of its use in the restaurant industry. Restaurants adopting social media and OFDPs as central components of their business model, are likely to deliver higher performance relative to rivals that miss to integrate these digital platforms into their BMC.

The BMC dimensions most exposed to change are key partners, value proposition, and revenue streams. The revised business model canvas hereby proposed arguably makes a meaningful contribution to the literature on BMC, in line with both the generic model of Osterwalder & Pigneur (2010) and the traditional restaurant business model canvas proposed by Indarwan et al. (2016).

Managerial Implications

This research aims to deliver useful insights for restaurant managers seeking to improve financial performance, especially their top line.

Evidence is hereby provided on the impact of social media, suggesting that more online reviews lead to higher financial performance. In light of such relationship, restaurant managers may consider implementing reward systems for customers that share their experiences and reviews online. The total number of reviews reflects the interaction that a restaurant has with its customers, and plays a crucial role in improving performance. Reviews are, in essence, e-WOM, and account for a valuable driver of customer choice, particularly among the younger generations. Moreover, as e-WOM bears such a significant impact on financial performance, it is arguably critical for restaurants to build capacity in managing this activity in their value chain.

Restaurant ranking on social media has remarkable influence on financial performance. In the traditional business model of restaurants, managers have been well aware that some salient factors improve performance, such as value, service, food, atmosphere, and customer satisfaction. With online rankings quickly relegating those traditional attributes, it is high time managers focus on enhancing the firm's social media profile.

Restaurants can use technology to increase operational efficiency, for instance improving the ratio of total guest per server labor hour, as noted in our findings. Zhu (2012) argued that servers could identify customers who have already ordered by implementing radio-frequency identification (RFIDs), instead of using traditional notepads. In this way, servers would have more time to improve operational efficiency, delivery times, increase the average check, and reduce operational costs. Besides, servers' operational efficiency is highly linked to kitchen efficiency. Kitchen efficiency affects food preparation time and the average duration of guests' meals –slow cooking times mean guests need to stay longer on-premise, lowering the server's productivity, hereby measured as guests per labor hour.

TripAdvisor's certification of excellence proved it means much more than just a decorative diploma on the storefront. It signals the restaurant's commitment to the highest quality standards in the variables reviewed in this study. In a marketplace where COVID-19 imposed social distance, preventing restaurants from optimizing sit-in capacity, intangible assets such as the certification of excellence can go a long way in forging a competitive advantage in crowded social media and food delivery platforms. Comparatively,

lacking such a quality seal, would put the restaurant in the need to constantly prove that it can deliver both excellent value and professional interaction with online guests.

While it is critical for managers to quickly identify and react to shortcomings in the social media and OFDP variables hereby studied, it is arguably even more critical to understand how these variables impact the firm's business model. The business model canvas is a visual representation of the business model itself, and can be used not only at the start-up stage, but as an iteration tool to improve the management of resources and capabilities in the value creation process. The revised restaurant BMC hereby proposed may serve as a roadmap for managers to implement the strategic and operational changes prompted by the increased digitalization of the restaurant business.

LIMITATIONS AND FUTURE RESEARCH

This study explored the factors of online food delivery platforms and social media that impact the traditional restaurant business model canvas. The factors were studied across multiple restaurants in Mexico City, measuring their effect on performance, and later translated into inputs to shape a revised, digitally-boosted BMC, reminding that business model innovation is an often critical –yet at times overlooked- driver of competitive advantage.

The findings result from a cross-sectional assessment, which is as much of a limitation as it is an opportunity to repeat the inferential analysis over time and measure the interplay of the selected variables in longitudinal studies.

The metrics for operational efficiency could be increased, to capture other potential sources of productivity gains both in onsite and online operations. This study built on the literature to measure operational efficiency as the ratio of guests per server's labor hour. Senior restaurant managers interviewed during the data collection process suggested additional variables, such as average order time per server, seat turnover, and kitchen cooking time per meal, among others. Extending and/or replacing variables would account for an opportunity for future research.

The literature on service marketing may stretch the scope of the current analysis and open another window to look into business model innovation.

The 'new normal' ensuing the COVID-19 pandemic will likely lead to augmented, digitally-loaded challenges to business models. Monitoring such challenges stands for an additional opportunity –arguably a need- for further research.

Finally, the inferential analysis was conducted on a purposive sample of independent restaurants in Mexico City, assembled with the assistance of the National Restaurant Chamber. Hence the findings have limited generalizability. Even if it could be argued that social media and OFDPs are global in nature and may therefore follow similar dynamics in shaping the financial performance of restaurants, context- and time-specific factors may lead to different outcomes. The same reasoning would apply for the change the significant variables may trigger in the restaurant business model canvas. Further studies may replicate this one, for instance in a mature market, expand the variables or carry out the analysis with diverse restaurant categories. Future research could also explore alternative moderating variables, beyond the certification of excellence.

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