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Avatar-Based Models, Tools, and Innovation in the Digital Economy

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cross-disciplinary collaborations. Their results are not only the development of perspective projects, but also the emergence of new industries in the economy. In the Chapter, the model of implementation of cross-innovative projects in the cluster as an EFFECTIVE modern production system is considered. Prerequisites are investigated and the model of realization of cross-cluster projects is offered. Considered are examples of successful implementation of collaborative projects within the clusters of countries in Western Europe and the USA. The perspective directions of cross-cluster projects for the development of the economy of Russian regions are determined. Dedicated perspective purposes for the management companies of clusters to promote cross-cluster innovation.

Different countries practice economic nationalism in different ways based on their emerging priorities in the social, political, and economic contexts. Both the developed economies and developing economies are exhibiting a recent surge in economic nationalism. The increasing globalization and the growth of world markets through greater exports has threatened the economic growth of developed economies that import more than export like the U.S.A. Many Asian firms have become globally competitive by using the processes of globalization and economic nationalism. Through effective firm strategy and economic nationalistic policies of China, the Chinese multi-national firm Huawei has exceeded Swedish firm Ericsson for making telecommunication equipment. Other examples include Lenovo and Haier from China and Infosys from India. Many Western nations including U.S. are beginning to warm up to the idea of using economic nationalistic policies to promote their own industries and make them more competitive globally. A country's economic openness affects its economic nationalism.

This chapter seeks to understand the EU-ACP trade relations under the economic partnership agreement (EPA) arrangement and its implications on economic nationalism of developing nations with specific reference to Zimbabwe. The research strongly leans on the view that EPAs have little or no economic benefit to the ACP. Even though the EU tagged the ensuing trade relationship with the ACP as partnership, in the real sense, it is more of paternalism. This is especially so as the EU dictates the terms and the pace of the negotiation, owns the incentives (in the form of aid and technical assistance), and either dispenses or withdraws it at will, depending on the "behavior" of the ACP countries. In order to benefit from EPAs, ACP countries must fund their own economies. ACP states should also address internal political challenges before committing to multiple economic fronts such as the EPAs.

Chapter 10

The chapter is about development of consciousness, emotion, motivation, and level of aspiration, with the ways that people react to the psychological, traumatic experience caused by the gradual realization of incapacity. Some people with an intellectual disability are capable of learning together with normally-developing peers if provided with special support; however, there are others who will need an individual education program adapted to their capabilities. The most important focus in working with such students is the individual approach with regard to the specific mentality and health of each person. Such an approach can be achieved through instructional methods like avatar-based learning as the improved development of project-based learning.

Chapter 11

The chapter discusses the creation of a mechanism for ensuring reliable and secure interaction among participants in regional innovation systems based on the establishment of smart contracts in the blockchain. The technology allows to reduce the possibility of fraud by dishonest participants, as well as to exclude the need for a third party by transferring its functions to a smart contract. This is important for ensuring confidential and transparent relations between participants in innovative projects, as well as with interested subjects of social and economic activities in the regions. The Ethereum blockchain platform was chosen to create smart contracts. On

its basis, there were developed components to perform transactions in contracting, creating, and implementing innovations, transferring intellectual property rights, using rights and licenses for innovation, etc. The main component of the system is a distributed transaction register with digital copies of innovation objects.

The chapter considers political communication organization in terms of its structural and informational aspects. The specifics of classic and online political communication are described through the theory of factors of speech communication regulation. The detailed coverage of speech regulation factors enables the author to describe classic and online political discourse. The analysis reveals some similarities along with differences between the two above said types of political communication. Some of the author's statements are exemplified with excerpts from political texts. The research was carried out on the material of American political discourse referring mostly to conflict situations and use of the same ideas for communications about Avatars Technology by Prof. Vardan Mkrttchian.

There is a need to get into a "clearing house" to shed light on certain operational concepts in the question at hand: (1) modern; (2) education; (3) "robotize"/"robotiz ation"/"robotizing"; and (4) people. People. In the present discussion, "people" may not only refer to students in a situation of formal schooling. It generally refers to all learners under normal circumstances and this context is taken in the light of what is previously pointed out in #2 where the inclusive application of the term education is given emphasis. "Robotize"/"Robotization"/"Robotizing". It is a neologism or a coinage, if you will, which is derived from the term "robot". A robot is basically a human-programmed machine capable of automatically performing tasks both simple and complex. Education: In simple terms, education involves teaching (in all its forms, so that it could be a learner teaching her/himself or an entity other than the learner that is the source of matters to be learned).

In this chapter, we will focus on training because the success of the digital economy is determined by knowledge, and therefore the people who create and apply knowledge. In the context of the digital economy, training has two main contexts: training with competencies that are in demand for the digital economy (regardless of the learning technology), and e-learning, in fact, implementing digital technologies in education, for training in any field. In general, the Federal project "Personnel for the digital economy" offers a fairly comprehensive approach to training. It is planned to create conditions for the implementation of personal trajectories of development and profiles of competencies of citizens, the development of the education system for the training of competent specialists in the field of digital economy, the implementation of retraining programs for the professions in demand in the digital economy, the involvement of highly-qualified foreign specialists, and the implementation of promising educational projects with the support of the venture fund.

Chapter 15

Open education becomes the important approach for education in the digital age and it plays a significant role in broadening educational access and increasing higher educational opportunities. The author of the chapter considers the basic principles and emerging trends in quality assurance of distance higher education in the digital age. Considering the intelligent distance education system as a dynamic, time-developing system, one can speak of the underlying computer imitation model that has an independent theoretical and practical value. The objective of this chapter is to explore how can information technologies influence the distance education quality assurance, specifically, to develop a conceptual framework for the intelligent distance education system. In addition to direct application for educational quality management system's evaluation, the simulation model can be used to solve a much wider range of tasks: forecasting, risk assessment, rating of courses, individual teachers, and individual institutions.

Preface

INTRODUCTION

This book aims to address the main issues of interest within the Digital Economy. Since Don Tapscott's 1997 bestseller, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*, introduced the concept, the Digital Economy has seen a huge development. It is the main driver of change, innovation and competitiveness for all sorts of companies and entrepreneurs alike.

In particular, this book will emphasize emergent and innovative aspects of design, development and implementation of Digital Economy initiatives, highlighting the relationship and interaction between humans and the technologies they routinely use to operate and live in a Digital Economy.

This book aims to address a range of approaches including, but not limited to, the conceptual, and technological and design issues related to the mentioned developments. It covers a wide range of topics, organized into the following sections:

Section 1: Enhanced and updated journal articles from the *International Journal of Innovation in the Digital Economy*
Section 2: New chapters about Avatar-Based Models, Tools, and Innovation in the Digital Economy

In the next paragraphs, the book structure is detailed, with its sections and respective chapters.

Section 1: Enhanced and Updated Journal Articles From the *International Journal of Innovation in the Digital Economy*

Chapter 1 is "Avatar-Based Innovation Tools for Managerial Perspectives on Digital Sharing Economy", written by Vardan Mkrttchian and Yulia Vertakova. The authors in this chapter show the essence, dignity, current state and development prospects of avatar-based management using blockchain technology for improving implementation of economic solutions in e-commerce in the framework of sharing economy. The

purpose of this chapter is not to review the existing published work on avatar-based models for policy advice, but to try an assessment of the merits and problems of avatar-based models as a solid basis for economic policy advice that is mainly based on the work and experience within the recently finished projects Triple H Avatar an Avatar-based Software Platform for HHH University, Sydney, Australia which was carried out 2008-2018 and Enhanced and updated journal article International Journal of Innovation in the Digital Economy, Volume 10, Issue 2, article title is Digital Sharing Economy.

Chapter 2, "Ethical Implications of Cooperation and Safety vis-à-vis Cyber Security in Africa", written by Essien D. Essien discourses on the threats to cyber security in today's digital society have revealed that cyberspace has become an arena of complex national security concern. This lends credence to the fact that many countries especially in Africa need to urgently scale up their efforts to effectively secure the internet and ICT infrastructures. Drawing upon extensive literature on cyber-security challenges, this study examines the phenomenon of cybercrime using Ronald Rogers' "protection motivation theory". The study employs qualitative analysis of current cyber-security landscape in Africa. Findings posit that with the risk and vulnerability of the cyberspace, cyber security in Africa pose a number of unique challenges which predicate a coordinated response for security and safety engagement. The study suggests collaborative measures to counter cybercrime through investigation, prosecution, and sharing information.

Chapter 3 is "Digital Marketing and E-Tailing Technological Innovations", written by Alan D. Smith. In an age of public mistrust of the most basic institutions, businesses are not exempted. Essentially all e-tailers want to deliver personalized and real-time communications to customers that are tailored to their interests, preferences, based on big data mining that customers will value over privacy concerns. e are in an era where e-commerce retailers continue to dominate the marketplace and it is integral that consumers are able to trust the manufacturers, retails, and the service/product reviews that they read online. Such trust is particularly important if their ultimate purchase decision is a successful one. A survey of middle-level managers was analyzed to identity the basic elements e-personalization, namely online purchasing behaviors, personalized communications, information retrieval services, degree of personal web presence, quality assurance of customer service, and the promotion of customization services. This element was found to be conceptually and statistically related to retailer benefits of increased buying and creates customer loyalty.

Section 2: New Chapters About Avatar-Based Models, Tools, and Innovation in the Digital Economy

Chapter 4, titled "Avatar-Based Modeling of Digital Communication in Political Conflict", addresses many of the findings within the data have generated more questions than answers; but in doing so, illuminated several paths of further

investigation that may provide greater insights into the complexities of stabilizing troubled states. This study then, is a starting point on a journey to discover more effective means to deliver humanitarian and development aid to conflicted societies without doing greater harm in the process. Holland discusses the utility of flight simulators in helping commercial airline pilots experience a variety of scenarios that would be unthinkable to expose passengers to in the real world. With even greater numbers of lives and resources at stake, utilizing agent based modeling as a policy simulator would allow leaders to experiment with numerous response and intervention strategies in a very short period of time.

In Chapter 5, titled "Avatars Expand the Opportunities of Modern Economy", there is no doubt that modern economy will change under the influence of digital technologies. This fact stipulates for the analysis of the possibilities of using new technologies in economic practice, as well as the consequences of this process. In this chapter the authors show how digital technologies contribute to the harmonization of economic interests at the micro- and macro- levels and maximizing the benefits. The purpose of this chapter is to try to assess the advantages and challenges of introducing digital technologies based on avatars using blockchain technology in various areas of economy. This approach is the theoretical basis for the development of economic solutions for the implementation of public policy on the development of digital economy.

Chapter 6 is titled "Blockchain Technology Is changing the Innovation Aspect in the Digital Economy". In digital era many are moving from their traditional methods of innovation to the high-tech technologies. They have been working day in day out to provide a secure platform to their customers. With their continuous efforts and hard work concept of Blockchain technology came into notice. Blockchain technology is popularly known for Bitcoins. Almost every third person or organization is either knows about it or using it. Blockchain technology is able to address most of the issues related to Digital Transactions, Double Spending, and Currency Reproduction. All these mentioned issues have been taken care of by Blockchain concept. The paper will completely discuss the basic concept of Blockchain. Some background history and what exactly is the Blockchain and how its networks and technology involved works. It will also focus on primary technologies evolved. By the end, the technical design and expected outcomes will be clearly understood. The chapter would also be an attempt to review other research done in this domain.

Chapter 7 is titled "Cross-Cluster Projects in Development of Innovations and New Industries". In modern conditions innovations appear not so much as a result of successive linear processes, but as a result of cross-functional interactions between different industries. Modern innovative projects are the results of cross-cultural, cross-information, cross-disciplinary collaborations. Their results are not only the development of perspective projects, but also the emergence of new industries in the economy. In the Chapter the model of implementation of cross-innovative projects in the cluster as an effective modern production system is considered. Prerequisites

are investigated and the model of realization of cross-cluster projects is offered. Considered examples of successful implementation of collaborative projects within the clusters of countries in Western Europe and the USA. The perspective directions of cross-cluster projects for the development of the economy of Russian regions are determined. Dedicated perspective purposes for the management companies of clusters to promote cross-cluster innovation.

Chapter 8 is titled "Development and Implementation of Adaptive Trade Policy in the Era of Digital Globalization Based on Virtual Exchange of Intellectual Knowledge". Different countries practice economic nationalism in different ways based on their emerging priorities in the social, political and economic contexts. Both the developed economies and developing economies are exhibiting a recent surge in economic nationalism. The increasing globalization and the growth of world markets through greater exports have threatened the economic growth of developed economies that import more than export like the U.S.A. Many Asian firms have become globally competitive by using the processes of globalization and economic nationalism. Through effective firm strategy and economic nationalistic policies of China, the Chinese multi-national firm Huawei has exceeded Swedish firm Ericsson for making telecommunication equipment. Other examples include Lenovo and Haier from China and Infosys from India. Many Western nations including U.S. are beginning to warm up to the idea of using economic nationalistic policies to promote their own industries and make them more competitive globally. A country's economic openness affects its economic nationalism.

Chapter 9, titled "Development and Implementation of Digital Tools, Neural Networks, and Cyber Control Systems in Sliding Modes", seeks to understand the EU-ACP trade relations under the economic partnership agreement (EPA) arrangement and its implications on economic nationalism of developing nations with specific reference to Zimbabwe. The research strongly leans on the view that EPAs have little or no economic benefit to the ACP. Even though the EU tagged the ensuing trade relationship with the ACP as partnership, in the real sense, it is more of paternalism. This is especially so as the EU dictates the terms and the pace of the negotiation, owns the incentives (in the form of aid and technical assistance), and either dispenses or withdraws it at will, depending on the "behavior" of the ACP countries. In order to benefit from EPAs, ACP countries must fund their own economies. ACP states should also address internal political challenges before committing to multiple economic fronts such as the EPAs.

Chapter 10, titled "Development of Avatar-Based Models and Tools for People With Intellectual Disabilities: As an Innovation System in Digital Era", is about development of consciousness, emotion, motivation, and level of aspiration, with the ways that peoples react to the psychological traumatic experience caused by the gradual realization of incapacity. Some peoples with an intellectual disability are capable of learning together with normally developing peers if provided with special support; however, there are others who will need an individual education program

adapted to their capabilities. The most important focus in working with such students is the individual approach with regard to the specific mentality and health of each people. Such an approach can be achieved through instructional methods like avatar-based learning as a the improved development of project-based learning introduced from authors in 2017 at Book "Instructional Strategies in General Education and Putting the Individuals With Disabilities Act (IDEA) Into Practice" - IGI Global publisher. This study will be chapter authors Ph.Dissetation (The leaders Prof. Vardan Mkrttchian, HHH University and Prof. Pam L. Epler, Grand Canyon University).

Chapter 11, titled "Integrating Blockchain Platforms With Big Data Solutions for Regional Innovation Development", discusses the creation of a mechanism for ensuring reliable and secure interaction among participants in regional innovation systems based on the establishment of smart contracts in the blockchain. The technology allows to reduce the possibility of fraud by dishonest participants, as well as to exclude the need for a third party by transferring its functions to a smart contract. This is important for ensuring confidential and transparent relations between participants in innovative projects, as well as with interested subjects of social and economic activities in the regions. The Ethereal blockchain platform was chosen to create smart contracts. On its basis there were developed components to perform transactions in contracting, creating and implementing innovations, transferring intellectual property rights, using rights and licenses for innovation, etc. The main component of the system is a distributed transaction register with digital copies of innovation objects.

Chapter 12, titled "The Fundamentals of Creating an Avatar-Based Expert for Decision Making in the Digital Era", considers political communication organization in terms of its structural and information aspects. The specifics of classic and online political communication are described through the theory of factors of speech communication regulation. The detailed coverage of speech regulation factors enables the author to describe classic and online political discourse. The analysis reveals some similarities along with differences between the two above said types of political communication. Some of author's statements are exemplified with excerpts from political texts. The research was carried out on the material of American political discourse referring mostly to conflict situations and use same ideas for communications about Avatars Technology by prof. Vardan Mkrttchian.

Chapter 13 is titled "The Use of Blockchain Technology Tools in Modern Education Reduces the Likelihood of 'Robotization' of People". We need to get into a "clearing house" to shed light on certain operational concepts in the question at hand: (1) modern; (2) education; (3) "robotize" / "robotization" / "robotizing"; and (4) people. In the present discussion, "people" may not only refer to students in a situation of formal schooling. It generally refers to all learners under normal circumstances and this context is taken in the light of what is previously pointed out in #2 where the inclusive application of the term education is given emphasis. It is a neologism or a coinage, if you will, which is derived from the term "robot". A robot

is basically a human-programmed machine capable of automatically performing tasks both simple and complex. Education: In simple terms, education involves teaching (in all its forms, so that it could be a learner teaching her/himself or an entity other than the learner that is the source of matters to be learned).

In Chapter 14, titled "Training for the Digital Economy", we will focus on training, because it was noted above that the success of the digital economy is determined by knowledge, and therefore the people who create and apply them. In the context of the digital economy, training has two main contexts: training with competencies that are in demand for the digital economy (regardless of the learning technology) and e-learning, in fact, implementing digital technologies in education, for training in any field. In general, the Federal project "Personnel for the digital economy" offers a fairly comprehensive approach to training. It is planned to create conditions for the implementation of personal trajectories of development and profiles of competencies of citizens, the development of the education system for the training of competent specialists in the field of digital economy, the implementation of retraining programs for the professions in demand in the digital economy, the involvement of highly qualified foreign specialists, the implementation of promising educational projects with the support of the venture fund.

In Chapter 15, titled "Open Education in Digital Era With Avatar-Based Control and Estimation", open education becomes the important approach for education in the digital age and it plays a significant role in broadening educational access and increasing higher educational opportunities. The author in the chapter considers the basic principles and emerging trends in quality assurance of distance higher education in the digital age. Considering the intelligent distance education system as a dynamic, time-developing system, one can speak of the underlying computer imitation model that has an independent theoretical and practical value. The objective of this chapter is to explore how can information technologies influence the distance education quality assurance, specifically, to develop a conceptual framework for the intelligent distance education system. In addition to direct application for educational quality management system's evaluation, the simulation model can be used to solve a much wider range of tasks: forecasting, risk assessment, rating of courses, individual teachers, and individual institutions.

Chapter 1
Avatar-Based Innovation Tools for Managerial Perspectives on Digital Sharing Economy

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ABSTRACT

The authors in this chapter show the essence, dignity, current state, and development prospects of avatar-based management using blockchain technology for improving implementation of economic solutions in e-commerce in the framework of sharing economy. The purpose of this chapter is not to review the existing published work on avatar-based models for policy advice. The purpose is to try an assessment of the merits and problems of avatar-based models as a solid basis for economic policy advice that is mainly based on the work and experience within the recently finished projects Triple H Avatar, an Avatar-Based Software Platform for HHH University, Sydney, Australia, which was carried out 2008-2018.

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INTRODUCTION

The economy of joint consumption, or as it is also called "sharing economy", is quite a new concept. It appeared in early 2000, and was associated with a new business model that sought to solve social problems, given the rapid population growth and the exhaustion of resources. This concept describes the interaction between people, some of whom have assets, but do not use them, and are ready to share these assets with other people to meet the needs of the latter. This concept has a certain historical conditioning of its origin. The undoubted advantage of the new model is the much higher efficiency of resource utilization. The main characteristics of the sharing economy are merchant or non-market transactions between suppliers and users, suppliers are individuals, professionals and non-professionals, the link between transactions is a digital device (platform). The sharing economy changes the pattern of production and consumption of goods and services. New technologies through digital platforms disrupt the links between supply and demand. All sectors are concerned through exchange relations based on mutual trust.

In the Oxford English Dictionary the term of sharing economy is defined as "an economic system in which assets or services are shared between private individuals, either for free or for a fee, typically by means of the Internet". According to Belk (2007) "sharing is an alternative to private ownership that is emphasized in both marketplace exchange and gift giving. It should be noted that the collaborative economy is transforming the way people produce, consume, finance, and learn. The sharing economy is changing businesses and social relation by leveraging technology efficiently by linking supply and demand in a favorable environment. An economic and consumption model essentially based on the exchange, sharing, rental of goods and services that favors the use rather than the ownership (Botsman, 2014). Online platforms assist demand and supply match in a particular market by facilitating peer to peer (P2P) selling (eBay and Etsy), P2P sharing (Airbnb, Uber, TaskRabbit) and crowd sourcing (Mechanical Turks, Kickstarter, AngelList).

THEORETICAL BACKGROUND AND LITERATURE REVIEW

This section gives the reader an overview of main research works and contributors associated with the this chapter. The sharing economy disrupts many sectors and jeopardizes the job of millions of workers all over the world. A growing number of workers in the developing, developed and emerging economies begins to worry about the future (Sundararajan, 2016). Because we are in the globalization era, the fast spreading of this concept affects simultaneously companies and workers in developed, developing and emerging countries. The destruction of jobs is accompanying the

evolution of this economy. The Creative destruction (Schumpeter, 2013) can be totally applied today to the sharing economy. The innovation of products, services and process will automatically endanger and eliminate many sectors. The collaborative economy is accused of creating precarious jobs, without social protection and escaping labor market regulations in the countries where it operates. Indeed, we may wonder whether it is really the vocation of this new economic model to create jobs or only to maximize profitability by inventing a new form of work. The labor market changes, today we are seeing a transformation of the economic system and capitalism, which primarily affects workers and employees. It is legal and legitimate to fear a new vision of work that threatens the existing order. The collaborative consumption involves product service systems, redistribution markets, and collaborative lifestyles.

We propose a broader concept of the sharing economy, including not only private individuals but businesses as well. Furthermore, the authors propose peer-to-peer, business-topper, and business-to-business models. It is noted that new technologies, such as the Internet, information and communication technologies (blockchain technologies, web-based services) are the main drivers for the expansion of the sharing economy. Blockchain is a multifunctional and multilevel information technology, designed to reliably record various assets. The technology of reliable distributed storage of records about all ever-committed transactions. The blockchain is a chain blocks of data, the volume of which is constantly growing as new blocks are added with records of the most. This is a chronological database, i.e. a database in which the time when the record was made is inextricably linked to the data itself, which makes it non-commutative. Data is represented by a sequence of records that can be supplemented. Records together with auxiliary information are stored in blocks. Blocks are stored as a single-linked list. Each participant is represented by a node, which stores the entire current data array and contacts other nodes. Nodes can add new entries to the end of the list, and also inform each other about changes to the list.

The blockchain network also results in transparency as the information is embedded within the network and it is public. It cannot be corrupted at any cost as alteration of any data on the blockchain would result in the usage of a huge amount of computing power to override the entire process. The blockchain makes up a network of computing nodes which solves the problem of manipulation.

New technologies have enabled the emergence of new multi-sided platforms, where people or organizations can share assets, skills, time, etc. The authors would like to underline, that the term “sharing” should not be understood in an altruistic way as helping others or charity. It is a matter of convenience, a fast and simple way to serve consumers who need products or services. They “share” those products or services via digital platforms.

It should be pointed out, that the most important factor that influenced the development and expansion of the sharing economy are digital technologies since they changed the traditional market behavior, which was not previously possible.

Development of Internet technologies and new trends in e-commerce, according to many experts, may change the world system of consumption almost beyond recognition in the near future (Krevskiy, et al., 2018).

Social networking has become one of the most popular communication tools to have evolved over the past decade, making it a powerful new information sharing resource in society (McCarroll, & Curran, 2013). It is known, social networking is the creation and maintenance of personal and business relationships especially through online social networking service that focuses on facilitating the building of social networks or social relations among people.

By embracing social networking tools and creating standards, policies, procedures, and security measures, educational organizations can ensure that these tools are beneficial.

Academics and researchers have applied Web 2.0 technology as a way of sharing knowledge and collaborating with others in a distributed, global environment. The Internet can be considered as a research network, where knowledge is created by the all participants and shared (McCarroll, & Curran, 2013).

Currently, there are allocated some examples of ESN (Enterprise Social Networking) and services:

- Social Networks (Social Networks).
- Social media resources (Social Media).
- Social Computing (Social Computing).
- Social information processing methods (Social Information Processing)
- Services of social networking (Social Networking Services).
- Corporate social computing ESC (Enterprise Social Computing) (Mkrttchian et al., 2016).

The authors in this chapter show the essence, dignity, current state and development prospects of avatar-based management using blockchain technology for improving implementation of economic solutions in e-commerce in the framework of sharing economy. The purpose of this chapter is not to review the existing published work on avatar-based models for policy advice, but to try an assessment of the merits and problems of avatar-based models as a solid basis for economic policy advice that is mainly based on the work and experience within the recently finished projects Triple H Avatar an Avatar-based Software Platform for HHH University, Sydney, Australia which was carried out 2008-2018 (Mkrttchian et al., 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018). The agenda of this project was to develop an avatar-

based closed model with strong empirical grounding and micro-foundations that provides a uniform platform to address issues in different areas of digital economic. Particular emphasis was put on the possibility to generate an implementation of the model that allows for scaling of simulation runs to large numbers of economic avatars and to provide graphical user interfaces that allow researchers not familiar with the technical details of the implementation to design (parts of) the model as well as engineering and economy experiments and to analyze simulation output.

MAIN FOCUS OF THE CHAPTER

Issues, Controversies, Problems

Economic policy for sharing advice in the E-Commerce and Organizational Learning process requires a thorough understanding of the relevant economic mechanisms that are responsible for the (overall) effects of policy measures in the digital economy. Policy advice based on models where aspects, that crucially affect real world effects of the considered policy measures, are missing might be flawed and result in misleading recommendations. Theoretical work based on certain model structures accompanied by empirical evidence aims at giving us guidance on the causal relationship of key economic variables. Methods for the analysis of such relationship within established classes of (typically equilibrium) models, by means of analytical, numerical or econometric approaches are well developed and continuously improving. However, a key challenge, when providing policy advice, is that we have to select among the various explanations for certain economic phenomena. It is hardly the case – maybe never – that only a single school of thought or an exclusive methodological approach is able to explain a set of observable economic relationships. There are different explanations for business cycle fluctuations, the distribution of income or the role of human capital investments for economic growth just to name a few topics that policymakers care about. However, the choice of the modeling approach (which aspects are in, which are out) and the tools of analysis might crucially influence the predictions of effects of policy measures and even the set of questions about policy effects that can be sensibly addressed in the framework of the model.

Obviously, the assertion which aspects of the economic environment have to be captured in order to provide meaningful policy advice on a certain issue is highly subjective – a prime example of differing subjective viewpoints in this respect is the controversial debate about the appropriate modeling strategy in E-Commerce and Organizational Learning process (see Colander et al. 2009, or Schneider and Kirchgässner 2009) – and we will not attempt to resolve the issue of how to select among different modeling approaches. Rather we would like to make a few points

how a fairly new protagonist in the area of model-based economic policy advice - avatar-based models – can enrich the possibilities of a modeler to capture economic phenomena that seem relevant to policy makers and extend the set of questions that can be asked about policy effects. Also, we briefly point to several issues that need to be addressed in order to make the approach even more useful and applicable for the economic policy analysis Avatar-based modeling is a strongly micro-founded approach to studying economic dynamics. It is interested in the emergence of patterns at aggregated levels of analysis that origin from the interaction of avatars, who follow particular behavioral rules and may be constrained in their choices by various institutional arrangements. Within the last decade or so many scholars have made important contributions to the area demonstrating the value added that can be derived from avatar-based management modeling for a better understanding of economic and more broadly speaking social phenomena. A large part of these contributions is documented in the special issues in the Journal of Economic Dynamics and Control, Computational Economics and IEEE Transactions in Computational Economics all edited by Tesfatsion (2001a, 2001b, 2001c), a special issue in Advances in Complex Systems edited by Contini et al. (2004) and the Handbook of Computational Economics edited by Judd and Tesfatsion (2006). Particular emphasis on the use of avatar-based models for economic policy design has been put in special issues in the Journal or Economic Behavior and Organization edited by Dawid and Fagiolo (2008) and in the Journal of Economics and Statistics edited by LeBaron and Winker (2008). Apart from these collections numerous chapters were published in various economics journals including the Eastern Economic Journal.

Solutions and Recommendations

Analytical models often require a restricted analysis for reasons of tractability. This is even true for general equilibrium models that lump together various factor and output markets and their interactions via prices and quantities. Although these models already go a long way and are by no means easy to handle and solve, policymakers have more ambitious problems to address. Just think about a constituency that is populated with heterogeneous households that differ in their skill endowment across space. Typically, a policymaker will want to know how a particular policy measure, as for example how to improve the acquisition of general skills, will impact the distribution of household income over time and space. In the Triple H Avatar project topics like these have been dealt with. While the primary aim of this endeavor was to show that it is technically feasible to program a software platform that allows the study of emergent phenomena including a spatial dimension and heterogeneous groups of society as an avatar-based model, we were already able to show that an approach like ours can go beyond existing models used for policy advice and give

additional insights. In Dawid et al. (2009a) a scenario of an economy consisting of two ex-ante symmetric regions is considered, where consumption goods can be transferred between the regions without costs whereas movement of workers between regions is associated with commuting costs. A policy maker plans to invest effort to increase the general skills of workers and it is examined how the spatial allocation of this policy measure (i.e. whether general skills are symmetrically upgraded in both regions or all upgrading is concentrated in one region) affects the economic dynamics in both regions, their relative performance and the dynamics of total output. It is shown that the effects of the two considered policies with respect to macro variables like (regional) GDP depend crucially on the spatial frictions on the labor market. A careful examination of the interplay of dynamics of various micro level variables like (skill) specific worker flows between regions, production costs, prices, sold quantities and investment exposes the causal chains of effects leading to the differences in policy effects under different spatial frictions on the labor market. In a nutshell, under asymmetric skill upgrading policies labor market frictions lead to temporary differences in production costs between the two regions, which induce demand shifts towards producers located in one region and, because physical capital is immobile, induces a strong demand for new capital goods in that region. In the Triple H Avatar model, as in the real world, investment of production firms in new capital goods is the key driver for diffusion of new technologies in the economy and therefore the large investments of production firms in one region induces a fast increase of productivity in that region, which in turn reinforces the relative cost advantages. This analysis highlights the economic mechanisms responsible for the positive effects an asymmetric skill upgrading policy has relative to a symmetric one in the scenario where spatial frictions on the labor markets are positive, but not so large that movement of labor between regions is excluded. In general terms we have demonstrated how temporary imbalances generated by spatial frictions induce long term effects through the dynamic interaction of different markets – labor, consumption goods and capital good markets – and spatial flows. Furthermore, the spatial flows are not uniform across skill groups and therefore generate dynamic changes of the (relative) skill distributions in the different regions. Although this pattern is far from trivial the use of a micro-founded avatar-based model allowed us to clearly highlight the reasons for the observed path dependency. As usual for theoretical models our claim is not that our model and hence the identified causal chains capture all aspects relevant in the real world. Rather, we provide insights into the effects of the considered policy measures within the context of a model that, although not all encompassing is able to capture institutional aspects, like different degrees of frictions on different markets, and spillovers through labor flows. An additional point to be highlighted is that the use of an avatar-based simulation model allows us to distinguish between short- and long run effects of policies, which

might substantially differ even in qualitative terms. This point has been stressed even more in Dawid et al. 2009b, where the implications of different patterns of labor market integration between regions with asymmetric local endowments with skills and physical capital has been examined within the framework of the Triple H Avatar model. Avatar-based models, as we were trying to illustrate also with our previous example, are strong in providing a test bed for the study of policy questions targeting the medium and long run by basing the analysis on economic mechanism that may unfold as a response to a policy intervention. Although a large amount of data is typically produced by these models – in the extreme every avatar with all his characteristics can be traced over time – and progress has been made in the calibration of avatar-based models (see, e.g., Windrum et al. 2007,) a quantitative application of avatar-based models for forecasting seems for us, at least currently, not feasible. Avatar-based models can do well in replicating stylized facts but are at least currently not well suited for forecasting the business cycle. They have the ability to give meaningful insights on the effect of policy measures for the medium and longer run. This stems from the deliberate modeling of the heterogeneous avatars' interaction in a spatial context with the inclusion of various factor and product markets. Only if this kind of economic structure is included in a model we will be able to study economic phenomena following policy interventions kicking in as feedback processes unfold. Even if it is at the current stage difficult or not yet feasible to quantify effects on output, growth or distribution measures, the possibility to at least qualitatively study the consequences of policy measures should be highly valued.

It also occurs to us that many economic phenomena relevant for a sound policy advice cannot be captured with representative avatars or mean field approximations appropriately. Let us exemplify this point by looking again into a modeling structure akin to the previously sketched one. In a growth context, one could postulate that the adoption of new technologies on the firm level is a function of the specific skills of workers, which may adapt faster to the technological frontier with higher general skills endowments of workers. Modeling carefully the time path of specific skills adoption requires the investigation of employment and unemployment patterns, as on the job learning will be the driver of the adaption of the specific skills as individuals are confronted with the more advanced technology at the firm level. Thus, a careful analysis should not only take into account the differences in specific skill upgrading between employed and unemployed, but also the fact that transitions into and out of unemployment systematically depend on workers' specific skill levels (workers with higher specific skills on average have shorter durations of unemployment). An explicit consideration of these dynamic implications of avatars' heterogeneity contributes to a better understanding of the effects of policy measures targeting the general skill level of labor market transitions. The general point that explicit

consideration of avatars' heterogeneity might indeed lead to qualitatively different policy recommendations compared to a model where only dynamics of 'average' avatar characteristics are captured has recently been clearly made in Arifovic et al. (2010) in the context of a standard policy commitment problem. A particular obstacle for selling sound economic policy advice to the policymaker is often that our addressees are not used to think in economic models or, more generally, the principle of abstraction for doing thought experiments. As they do not see a model which reflects their perception of the world advice based on highly abstract vehicles of thinking is likely to be rejected. Avatar-based models may be less prone to be rejected by policymakers as they usually are characterized by a lot more economic structure. This is not to say that an avatar-based modeler would choose any other general approach of building his model than a more orthodox economist. It is rather the larger toolbox that avatar-based models offer which allows him to bring into the picture features of the system that policymakers may find more convincing. Avatars can for example be endowed with different behavioral rules which policy makers recognize from own experience. It is feasible to model an economy along its spatial dimension, and institutions can be incorporated in a much more fine-grained way as in more traditional approaches. As the policy-maker's part is usually about deciding on the institutional environment and possible changes of that, having a more accessible model in that respect may be of great value for a fruitful interaction between policy advisers and policymakers.

While most of our discussion so far focused on how to write down an avatar-based model that brings into the picture a simultaneous analysis of various non-negligible institutional, spatial or economic features for a better policymaking, an underdeveloped branch of avatar-based modeling is certainly the positive analysis of economic policy making. Early work by Kollman et al. (1997) already showed the way how to study the variance in economic policy choices when individual preferences are aggregated up under different voting mechanisms. It occurs to us that avatar-based models are far from being fully exploited as a means of positive policy analysis. More should be done to bring together a meaningful economic model with an equally meaningful political model that does justice to the intricate rules which characterize democratic societies and shape policy outcomes. Admittedly most of our selling points had the flavor of "we – the avatar-based modelers - can do more". This should not be misunderstood as an argument that in general bigger models are better. Quite on the contrary, it seems crucial to us, that, regardless whether analytical or simulation methods are employed, models are carefully built in a way that only those aspects of the economic environment which seem directly relevant for the policy question at hand are modeled in some detail. A closed macroeconomic avatar-based model has to contain all relevant market, but this does by no means imply that all these markets have to be modeled with identical granularity and institutional richness. Nevertheless,

closed macroeconomic avatar-based models typically are quite large and building big models requires big computing power. But machines that potentially can do the job exist and are used by other professions like meteorologists or physicists. However, a lesson learned from our Triple H Avatar project was that running economic models on parallel machines brings up new and non-trivial problems. The reason behind these technical issues is quite intuitive: parallelization requires the slicing up of a big task into digestible smaller chunks. The question becomes how to cut through an economic system. An obvious candidate is the spatial dimension of an economic model, i.e. to allocate the computing to be done for a particular region to a particular processor. However, as there is considerable interaction between regions as in economic models factor and product markets are typically highly interdependent across regions via the flows of worker, capital, intermediate or final goods, a lot of communication between processors has to be organized which can considerable slow down the computing. In order to be able to use avatar-based models for economic policy advice in a way we sketched it, problems of parallelizing code or in general computing issues need to be resolved. In addition and coming back to our argument of convincing policymakers of the appropriateness of the framework on which the policy advice is based, easy to use and intuitive graphical user interfaces (GUIs) need to be developed. Ideally, at some point these GUIs would be so user-friendly that any interested person would be able to run his own simulations.

Another issue down the road, which we find important as we want to precede to using avatar-based models for economic policy advice, is the behavioral foundations of the (heterogeneous) avatars that populate our models. Once we deviate or even abandon the perfectly rational avatar model of High Technology there are many degrees of freedom on what to assume for the behavior of an avatar, may it be a worker, firms or a government agency. In the Triple H Avatar project we followed the modeling philosophy to apply management rules for modeling firm behavior. For most decision problems firms face the management literature offers standard procedures (which are often heuristic methods). Examples are specifications on how firms plan their production volume or replenish their stocks. Some of these suggestions are even implemented in standard software that is purchased by firms to automatize on these operational management decisions. As we want to base the policy advice on models where firm behavior is as close as possible to the performance of real-world firms it seems natural and also for outsiders convincing to rely on such standard rules where available. For the modeling of the behavior of individuals a promising approach seems to be incorporate findings from experimental studies. These findings make a strong point for the existence of heterogeneous types of avatars in a population (see, e.g., Plott and Smith, 2008). We need to link to these research outcomes more closely to our avatar-based models. It will not only strengthen the scientific foundations of the models but also make them for outsiders a more

convincing tool for policy advice. After all, how reliable, for example, is a model as a basis for pension policy recommendations, if it does not take into account that people look forward differently when deciding on old-age savings rather than on other economic issues?

FUTURE RESEARCH DIRECTION

We believe that in many circumstances, avatar-based management models have a menu to offer that allows us to incorporate into our models economic, institutional and behavioral structure in E-Commerce and Organizational Learning process. This provides a sound starting point for economic policy advice and allows addressing issues and phenomena that can hardly be captured by alternative approaches. Nevertheless, as is the case with other methodological choices, there are limitations involved and these should be clearly communicated when putting forward avatar-based management policy analyses to avoid misunderstandings. We expect that future work in this area will reduce the limitations of the approach and make it an even more appealing tool. Future research should emphasize the contribution of the sharing economy to the sustainable development. The question of how much sharing economy contributes to the sustainable development should be raised. However, the authors of the chapter note the lack of statistics concerning the sharing economy in E-Commerce and Organizational Learning process. Consequently, further research is necessary to have a meaningful debate about its benefits in E-Commerce and Organizational Learning process.

CONCLUSION

1. The sharing economy is a new phenomenon in E-Commerce and Organizational Learning process, and there are still many unanswered questions concerning its impact on traditional businesses and the labor market or its future directions. Consequently, it is important to analyze the sharing economy's impact on employment, what are its opportunities or challenges to the labor market and the sharing economy aspects in E-Commerce and Organizational Learning process.
2. It should be noted that there is no consensus on the definition of the sharing economy in E-Commerce and Organizational Learning process. Usually, the sharing economy in E-Commerce and Organizational Learning process is defined rather narrowly, highlighting trade between individuals. The authors propose a broader concept of the sharing economy and state that the sharing

economy could be defined as multi-sided digital platforms as a Triple H Avatar-Based Management that create an open market for services and products and act as an intermediary between users and service providers. Members of the sharing economy in E-Commerce and Organizational Learning process could be individuals and businesses.

3. Surveys available in the literature and that the survey conducted by the authors reveal that the most important factors that influence participation in the sharing economy E-Commerce and Organizational Learning process are economic: saving money and an easy way to make extra money. However, social factors, such as being useful to society and supportive to local communities are noted as well are need E-Commerce and Organizational Learning process.

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Chapter 2
Ethical Implications of Cooperation and Safety vis-à-vis Cyber Security in Africa

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ABSTRACT

Discourses on the threats to cyber security in today's digital society have revealed that cyberspace has become an arena of complex national security concern. This lends credence to the fact that many countries, especially in Africa, need to urgently scale up their efforts to effectively secure the Internet and ICT infrastructures. Drawing upon extensive literature on cyber-security challenges, this chapter examines the phenomenon of cybercrime using Ronald Rogers' "protection motivation theory". The study employs qualitative analysis of the current cyber-security landscape in Africa. Findings posit that with the risk and vulnerability of the cyberspace, cyber security in Africa poses a number of unique challenges which predicate a coordinated response for security and safety engagement. The study suggests collaborative measures to counter cybercrime through investigation, prosecution, and sharing information.

INTRODUCTION

Empirical studies linking contemporary discussions on digital society and cyber security indicate that Africa and indeed other developing countries faces a number of interrelated challenges, foremost being the cyber threat

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visibility among African organisations, government establishments and businesses (Zillien & Hargittai, 2009). Currently, technology has changed the business landscape in Africa dramatically. From strategic options to creation of new opportunities for innovation in products and services, technology is now incorporated in many if not all aspects of business. Internet usage has also seen a tremendous increase especially within the African region. However, as more businesses digitize their business processes and move to the Internet, the potential attack vectors for these organisations expand (Agboola, 2006). It is obvious that today, new types of crime perpetrated by means of sophisticated technology have replaced traditional crimes such as fraud, stealing by tricks, and obtaining under false pretence. Also, traditional boundaries have fallen away and a virtual borderless world has become a platform for crime. In recent years, cyber security related incidents have continued to increase in frequency and impact. In spite of the huge successes and positive attributes that the digital environment has introduced as an integral part of the modern information society, the resultant growth trajectory for cybercrime and related incidence heightens the extent to which cyberspace vulnerabilities and limited capacities prevent Africa from maximising the benefits of the digital economy (Zillien & Hargittai, 2009).

Given this scenario, the use of Internet and Information and Communications Technology (ICTs) has become a matter of strategic importance. With the increase in cybercrime activities, people are facing a growing number of uncertainties related to the use of the digital environment. Digital security threats and incidents have increased the financial and reputational consequences, reduced privacy and in some cases, produced physical damage. Although stakeholders are increasingly aware of these challenges raised by digital security risk, they often approach the problem only from the technical perspective, and in a manner that tends to play down on the ethical implications of the social cleavages in digital use and applications that accompany information poverty and insecurity challenges (Ahmed, 2008). In the light of this turn of events, cyber security landscape and processes are redefining security in the 21st century everywhere in the world (Wada & Odulaja, 2012). The Internet and the ICTs constitute vital infrastructure for growth and development. They are the new drivers for innovation and social well-being.

In fact, the role of the Internet in supporting the economy, delivering information and education, and in enabling creativity is well implicit and acknowledged (Kuma, 2010). The Internet economy is a dynamic environment where technologies, applications, uses and markets constantly evolve, often in a volatile manner. While the Internet benefits economic growth and innovation, attacks against Internet infrastructure represent a major risk to economic growth and innovation in any society. Apparently, the world's growing dependence on the Internet has revealed that cyber space is now as important as physical space. Its vulnerability to disruption and attack has highlighted the importance for a coordinated response for security in

all spheres, be it national, regional or global levels (Eric, Isaac & Chanika, 2011). This lends credence to the fact that as the society continues to be operated largely on technology and almost everything we do is dependent on it; the imperatives of cyber security cease to be an optional project. It follows therefore that as technology brings ever greater benefits, it also bring with it ever greater threats which by the very nature of the opportunities it presents it becomes a focal point for cybercrime, industrial espionage, and cyber attacks. Therefore, protecting it is of paramount priority. This explains why some scholars, analysts and theorists of the network society have argued that the global information revolution underpinning online transaction and movement as well as networked society is generating increasing threats, vulnerabilities and exploitable weaknesses which require responsibility for cyber security, especially with regards to essential infrastructure and governance (Alex, 2011).

THEORETICAL FRAMEWORK

The theoretical framework that underpins this study is the "protection motivation theory" which was propounded by Ronald Rogers in 1975. The theory measures the survival behaviour of a person, country and/or region when informed or aware of a threatening event such as cyber criminal activities (Rogers, 1975). According to the theory, such survival actions are directly subjective to a commensurate management response which indicates the idea of making provision for collaborative decision-making on cyber security. The management response in this regard is the net result of the country's evaluation of the threat appraisal and management appraisal. Cyber-crime threat appraisal in this perspective refers to a country's assessment of the level of danger posed by the threat. The protection motivation theory, therefore, plays a significant role in determining one's ability to acquire skill, information and knowledge through collaborative policies and governance in cyber security. The tenability of the theory of "protection motivation" rests, therefore, upon the maintenance of cooperative strategy with strong guarantees for security and protection. This, however, is clearly exemplified in the perceived vulnerability, perceived severity, and perceived frequency of cyber criminal activities in Africa (Rippetoe & Ronald, 1987). The penchant for this behaviour involves the psychological pleasure as well as peer approval experienced today (Essien, 2015). The second idea however, revolves around the security response consideration which has something to do with an individual, nation or regional assessment of the capacity to cope with and/or avert the accompanied loss and damage resulting from threats and/or danger of cyber-criminal activities. Another dimension of the theory is the self-efficacy, response efficacy, and response cost of adopting countervailing measures toward

cyber-criminal activities. In cyber-crime for example, self-efficacy refers to criminal's confidence being involved in the act, response efficacy to the consequence of the act, and the response cost to pull out or stoppage of cyber criminality. For a people or continent plagued by growing level of insecurity such as food insecurity, conflict and poverty, vulnerability and dependency in technology and scientific advancement, averting cyber-crime activities, as well as developing effective security response strategy towards cyber threats in telecommunications and the Internet deserves critical thinking and cooperation of a very high precedence (Essien, 2019).

Cyber Security Landscape in Africa

The landscape of cyber security in Africa is changing rapidly with the evolving technology and expanding digitization which are providing new opportunities and challenges. Accomplishing the culture of cyber security responsiveness is of utmost importance in today's technological landscape. The cyber-crime landscape in Africa is rapidly changing with vulnerability and threat actors growing in size, scope, complexity and capability. Latest scholarship on the subject show that the number of Internet users has grown from less than a million in 2003 to over 80 million in 2016 (Essien, 2018). In recognition of the increased importance of Internet, cyberspace has become an essential component of modern society. Cyber security is considered an emerging challenge in Africa in contemporary time. Africa's exponential growth, and the associated expansion of IT connectivity and business, has led to the continent becoming a high value target for cyber attack. Cybercrime in the African continent has moved far beyond the notorious 419 Nigerian email scams, coined after the code of legislation aimed to suppress such scams.

The sophistication of some attacks and tactics used by cyber criminals clearly demonstrates how vulnerable individuals are online and how they have disfigured public confidence in online security and commerce (Castells, 2010). The infection rates for infrastructures in African countries runs between 57 per cent and 98 per cent. The cybercrime space in Africa is advancing so rapidly, such that it can be a challenge to deal with it. Regrettably, about 62 per cent of users of cyber space do not have any cyber crisis management plan in place to help them respond to a breach and vulnerabilities. This portrait can be compared with 40 per cent in Europe and Middle East and 31per cent in Asia (Kaiko, 2014). It would be useful to note that with the prevalent threats and vulnerability level, broadband services are opening in different parts of the continent, which means more users would be able to access the web, translating into more viruses and spam from online sources (John, 2013). Unfortunately, those who use Internet in Africa do not have a clue as to how to protect themselves and their personal information against cyber attacks directed at their gadgets.

Table 1. African cyber security threat landscape

Target sectors of cybercrime in Africa	1. Government Agencies, African Think Tanks 2. African Media, Communication service providers 3. Various Sectors of the African economy (Financial, Petroleum/Oil and gas, Retail, Power and energy, ICT, etc.) 4. Critical Infrastructures-Health, Education, Power, Transport, Industry etc. 4. High Profile Government Websites 5. Industries, parastatals and private establishments etc
Tactics adopted by cybercrime fraudsters in Africa	1. Spear Phishing 2. Software Hijacking 3. Specific Nigerian Firewall and AV Targeting 4. Malware, Spyware and Adware 5. DDOS 6. Colluding with insiders to defraud

To make matters worse, cybercrime has started to exploit mobile devices in the African continent. The reason being mobile devices such as smart phones are reasonably cheaper and affordable in the rapidly evolving mobile landscape in Africa. The growth, however, has been fuelled in large part by the liberalisation effort resulting in the formation of independent regulatory bodies and increased competition in the market (Fawzia, 2011). Currently, the total African mobile subscriber base is approximately put at 280.7 million people, about 30 per cent of the total population. Approximately, 15 mobile operators in countries like Nigeria, Kenya and Tanzania are already planning to introduce 3G and data service (Lewis, 2018). Already, in Nigeria, Glo Mobile is currently operating with 3G and about to introduce 4G data services. This magnitude of increase in mobile use (mobile phones with web connectivity) presents a veritable open door for all cyber criminals to exploit mobile users in Africa with little or no cyber safety knowledge. It has to be noted, that more individuals worldwide gain Internet access through mobile phones. Critically speaking, it is pertinent to note that cyber criminals in Africa are comfortable with millions of inexperienced users whom they deceive with unsophisticated scamming techniques than with more knowledgeable and experienced users who have grown wise over the years (Lewis, 2018).

It is therefore, obvious that in Africa, most people are not aware of the cyber danger surrounding them. They are just happy that they can operate their gadgets and can connect to the Internet. It is important to train and educate this group of users in the art of using these gadgets and the cyber space safely. This definitely is the area that needs to be explored and action taken effectively to properly understand the cyber landscape (Klimburg, 2012). The borderless nature of cybercrime makes African countries vulnerable to all threats already present elsewhere. In this context, African

policy-makers find themselves in the compelling need to develop and implement effective policies, legislation as well as awareness and education initiatives to address the risk of cybercrime and cyber threats, in general. But any set of measures to be effective require a thorough understanding of the threat landscape. To this end, cyber intelligence is a crucial tool in the effort to increase cyber security and consequently confidence in the use of technology (Neresh, 2010).

Expectedly, Symantec, the world's leading cyber security company, with the largest set of sensors on the Web, organised what is called Global Intelligence Network (GIN). Every year, hundreds of skilled analysts, analyse trillions of bytes of telemetry gathered through these sensors, and distil the data into an annual report known as the "Internet Security Threat Report (ISTR)". Also, in order to overcome the information gap, the African Union (AU) and Symantec, through the Global Forum for Cyber Expertise (GFCE) and with the support of the US Department of State (DoS), engaged in a Public-Private Partnership to develop a report that collected and presented detailed technical data on the cyber security threats in Africa (Warshauer, 2003). The report tagged **"**Cybercrime and Cyber Security Trends in Africa**"** analyses the key technological trends in the continent and the cybercrime proliferation and its techniques. However, the unique feature of this report is that it incorporates online threat data from Symantec's comprehensive cyber threat monitoring network, as well as the perspectives of African Union Member State governments. It is pertinent to note that some key findings point to the proliferation of ransomware, social media scams and the explosion of mobile malware in the African continent (Essien, 2018).

The Challenges of the Cyber Security Phenomenon in Africa

Despite the strong starting position of the digital society, the gains and benefits from the digital systems remains risky and complex. This is so because vulnerabilities remain widespread, attacks are also increasing, and breaches are incurred which cause substantial harm to individuals and businesses. Taking cognizance of this projection, the digital systems if not well-secured, would face more threats as they become more complex, and especially as the pay-offs to attackers increase. This, therefore, poses a serious challenge to cyber security, policy and management in protecting the cyber space, individuals and businesses against these threats. Cyber security no doubt is a multi-disciplinary concept which needs to take into account the social and behavioural sciences (Castells, 2000). The understanding of the real-world behaviour of digital and human systems depends on a wide range of disciplines involved in the digital activities. It follows that effective cyber security measures would need to integrate insights from all the disciplines (Nissenbaum, 2005).

Indeed, cyber security challenges are comprehensive in nature, with networks, services and attacks rarely confined to a single jurisdiction and/or discipline. This also explains why data transmitted around the world can be rapidly replicated. Moreover, the sensitive nature of the material protected by cyber security can affect how much information is shared about protective measures, vulnerabilities and breaches. This knowledge is an important collective resource for improving cyber security defences, even though its use is often limited by lack of transparency (Olasenbaum, 2005). This lack of transparency is often based on justified concerns about the risks of releasing information. On the whole, cyber threats are hard and/or pretty difficult to predict simply because they are constantly evolving. This makes the attackers to exploit the vulnerabilities created by the complexity of the system and increased reliance on the digital systems (Reid & van Niekerk, 2014). A good example is the malware virus which has been noted to have extended its tentacles into highly targeted exploits. Also, we have cases such as ransomware and silent malware that remain undetectable until they are activated. It presupposes the fact that to deal effectively with these evolving threats, the digital sector must itself be diverse and responsive.

The Nature of Cyber Security Threats in Africa

Today, there are about 400 million Internet users in the continent of Africa. But, the sorry story is that about 80 per cent of all personal computers on the continent are infected with different kinds of viruses and other malicious software. This however, costs Africa about $2 billion (Kritzinger & vonSolms, 2012). Africa is considered to have a permissive environment for cyber criminals due to lack of security capabilities, absence of relevant legislation and general lack of awareness of cyber security measures. Throughout the five regions of Africa, namely, Northern, Central, West, East, and Southern Africa, with their different levels of connectivity and penetration to the Internet, cyber criminals in their nefarious activities are more businesslike, bold and professional.

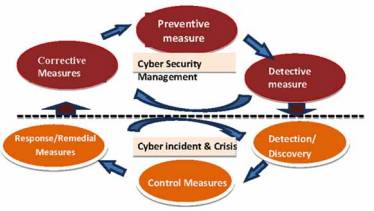
The impact of the cyber criminals is not only felt by the targets they exploit, but also concerns the sums of money they seek (Olasenbaum, 2005). These criminals' projects are for all intents and purposes fully-functioning business enterprise, covering a multitude of disciplines and individuals, each with their own area of expertise. The situation looks so real because of the weak infrastructure status of Africa in tackling cyber security vulnerability; also pertinent are issues of poor legal framework, inadequate security facilities, derisory manpower, and deficient resource base (Brent, Douglas, Dallas & Fern, 2011). Nonetheless, the fight against cybercrime requires coordinated effort among all stakeholders such as government bodies, educational institutions, business organisations and law enforcement authorities.

Cybercrime is on a dramatic rise on a worldwide basis, and Africa is not immune from it. In order to carry out their activities, cyber criminals look for fertile environments, both in terms of technological vulnerability and user behaviour. As an example, Africa is the leading force for mobile money transfers: 14 per cent of all Africans receive money through this medium. Further, the e-commerce business is estimated to reach a market value of $75 billion by 2025 (Atta-Asamoah, 2010). This immediately becomes an enticing proposition for increasingly sophisticated cyber criminals, who, like everywhere else in the world, exploit both vulnerable technology and users' carelessness. Moreover, outdated operating systems further compound the situation. Indicatively, about 25 per cent of personal computer users in Africa are still on Windows XP that were first released in 2001 and today unsupported and unpatched, or even pirated software (Wellman & Haythornthwaite, 2002). Meanwhile, in the mobile sphere, nine out of ten devices use the Android operating system which is by a long way the most vulnerable in the marketplace. It is worth mentioning that digital developments in Africa are already moving at a faster pace and the society is changing profoundly (Fuchs, 2010).

However, new challenges arise alongside this growth tempo just as the increasing technological exposure poses its own vulnerabilities and risks. For instance, it is argued that the volume of threat in Africa is extremely massive and disturbing, with 286 million different virus samples counted (783, 562 samples per day; 32, 648 samples per hour; 544 samples per minute and about nine samples per second) on a yearly basis (Olasenbaum, 2005). This development presents a very dangerous portrait as hackers could invade critical infrastructures such as the airport control tower and release information that could compromise weather and traffic signals to pilots in-flight. In this situation, the dire consequences are that planes may disappear just as it was popularly suspected when the Malaysian flight MH370 that departed from Kuala Lumpur International Airport on March 8, 2014 got missing en route to Beijing. This may have been a victim of cyber terror attack (Essien, 2018).

The consequences could also be disastrous if hackers invade the defence, oil and gas installations, banking and telecommunication sectors. Considering the borderless nature of cybercrime and emerging cyber security threats in contemporary time, the only viable way forward in fighting cybercrime is through multi-stakeholder, inter-agency, bilateral and multilateral collaboration and cooperation (UNDOC, 2013). Today, the challenges of information communication technologies (ICTs) in Africa toward achieving a level of technological security in order to prevent and control risks; contribute to the economy and guarantee access to information to individuals while at the same time creating a climate of confidence and trust in ICTs and protecting rights and freedoms is quite enormous (Chen, 2004). On the appendage of this development, the global tracking of cyber attacks in Africa indicate

Figure 1. Cyber security life cycle and measures



that many countries are struggling with high cases of software piracy, intellectual property theft and malware attacks.

This situation presents a serious challenge to the continent's resolve to take advantage of the enormous opportunities that the digital system offers, while balancing and managing its associated risks. However, what is particularly intriguing about cyber security and its challenges is the way and manner in which the cyber attacks are carried out and/or sponsored by the cyber fraudsters. Perhaps, this is due to the fact that cyberspace does not have defined jurisdiction by air, sea or by land, and hence, the perpetrators of cybercrimes not only remain ubiquitous but also dangerous. A good example of cyber security and its challenges in Africa is the incident in August 2012, when Boko Haram, the insurgent group responsible for several thousands of deaths, kidnaps and bombings in Nigeria reportedly hacked the personnel records and databases of the Directorate of Secret Service (DSS) or State Security Service (SSS). Nigeria's secret police is popularly known with the acronym DSS or SSS. Boko Haram group was able to successfully compromise the covert personnel data system of the DSS (Essien, 2015). This however, culminated into database breach and revealed the names, addresses, bank information and family members of current and former personnel assigned to the country's undercover policy agency. Rationalizing the show of aggression on the security outfit, the Boko Haram group held that the security breach was carried out in order to get back at the government and protest the Nigerian Government handling of issues involving the insurgents, especially the non-release of their members detained in various prisons across the country. Interestingly, this case scenario obviously depicts the facts that no nation is strictly speaking immune from cyberspace attacks irrespective of status. The preponderance however, tends to swings heavier in developing economies such as Africa because of inability to prioritize security (Essien, 2018).

Table 2. The cybercrimes landscape in Africa can be categorised into two segments for easy comprehension

Conventional Cybercrime through the Use of Computer	Common Frequently Used Cybercrimes and Their Techniques in Africa
(1) Identity Theft/Social Engineering (2) Financial Crimes (3) Cyber Pornography (4) Online gambling (5) Intellectual property crime (6) E-mail spoofing (7) Forgery (8) Cyber defamation (9) Cyber Stalking	**Types** (1) Yahoo Boys (2) The Next Level Criminals **Techniques** (1) Phishing (2) Unauthorised access to computer system and networks (3) Theft of information contained in electronic form (4) E-mail bombing (5) Data diddling and mobile pharming (6) Denial of service attacks (7) Virus/adware worm attacks (8) Trojan and malware attacks (9) Card/Data interception

Common Types of Cybercrimes in Africa

Though cybercrime encompasses a broad range of illegal activities perpetrated electronically, it can be generally divided into five broad categories with detachments such as intrusive offences, content-related offences, copyright and trademark-related offences, computer-related offences, and combination offences. However, the complexity in types and forms of cybercrime increases the difficulty to fight back and/or provide commensurate security. According to Symantec Corporation, there are several contributing factors that attract cyber criminals to operate in specific countries and regions of the world, such as access to broadband connections and/or uninterrupted Internet connectivity (Castells, 2001). Nonetheless, the cybercrimes landscape in Africa can be categorised into two segments for easy comprehension as indicated in Table 2 below:

Categories of Cybercrimes Prevalent in Africa

There is an endless list of possible crimes that can occur through the use of the Internet and computer. Worldwide, the predominance of electronic pathways in most payment system has made them ready targets for fraudsters. This study attempts a description of a good number of the widespread forms of electronic fraud technique common in many countries in Africa:

Basically, there are two common types of cyber criminals in Africa. Prominent among these emerging groups are known as the "Yahoo Boys" and "Next-Level

Cyber Criminals." These two groups portray distinct characteristics and operate different types of scams based on their levels of experience.

Yahoo Boys

Studies have shown that the "Yahoo Boys", are so named as a result of their use of Yahoo apps to communicate. They are often part of groups operating in the same physical location and supervised by a more experienced ringleader. These cyber criminals see a scam from beginning to end and often carry out multiple attacks at one time. They specialise in advance-fee, romance and stranded-traveller scams, such as the "Nigerian Prince" phishing emails that brought West Africa on the theoretical map of cybercrime in the early 2000s. Their goal is to convince unsuspecting victims to transfer large sums of money for a variety of illegitimate reasons. "Yahoo Boys" typically lack maturity and actively use social media to show off their ill-gotten wealth (Agboola, 2006).

Next-Level Cyber Criminals

The second most popular group is called the "Next-Level Cyber Criminals". This group is the opposite of "Yahoo Boys". The group consists of well-off and highly respected family men who are mature in terms of personal behaviour. Although new to the scene, "Next-Level Cyber Criminals" engage in more complex attacks, such as Business Email Compromise (BEC) and tax scams, by using malware and other crime-enabling software from Russia and other English speaking underground markets. They also maintain connections and accounts overseas as a way to feign legitimacy with their victims and keep law enforcement at arm's length. Due to the sophisticated social engineering tactics required to pull off these scams, significantly more research and effort goes into the crimes committed by "Next-Level Cyber Criminals" Long, Mbarika, Kourouma, Wada & Isabolija, 2009).

Identity Theft/Social Engineering

Identity theft is a form of fraud where a person uses another person's personal information to engage in fraudulent activities. It can take many forms, from fraudulent credit card use, to your entire identity being used to open accounts, obtain loans, and conduct other illegal activities (Long & Chiemeke, 2008). Be suspicious if anyone asks you for your personal information. Scammers use convincing stories to explain why you need to give them money or personal details.

Card (especially ATM) and/or Skimming

Card skimming involves the illegal use of a skimming device to copy, capture and collect data from magnetic stripe and PIN on credit and debit cards. The captured card and PIN details are encoded onto a counterfeit card and used by an identity thief to make fraudulent account withdrawals and transactions in the name of the actual account holder. Skimming can occur at any bank ATM or via a compromised POS machine. Usually, fraudsters would attach false casing and PIN pad overlay devices on genuine existing ATMs, or they can attach a disguised skimming device onto a card reader entry used in tandem with a concealed camera to capture and record PIN entry. This tactic has resulted into numerous fraudulent activities across many countries in Africa. The Central Bank of Nigeria reported recently that the Nigerian banking sector lost over ₦20 billion through Internet fraud and the impact on the nation's cashless policy is significant (Essien, 2018). Table 2 above simply give an unambiguous impression of the types of cybercrimes that exist in Africa. Although the volume of fraud cases reported in 2015 and 2014 had increased by 78 per cent and 70 per cent respectively, this is however, relative to cases reported in 2013. Similarly, the value of attempted fraud cases reported in 2014 and 2015 decreased by 60 per cent and by 50 per cent, respectively. The actual loss associated with fraud cases reported in 2015 and 2014 increased by over 1000 per cent relative to 2013 loss. Similarly, actual fraud loss as a percentage of attempted fraud increased to 80 per cent and 85 per cent in 2014 and 2015 respectively, from 3 per cent in 2013. Table 3 below shows the distribution of actual loss through cyber fraud (2018).

Adopting Security Response Approach for Cyber Security in Africa

The African continent has become a nest for cyber criminals. For instance, those who specialise in the "419" scam, named after Article 419 in the Nigerian criminal law that penalises fraud and specifies the fines and other penalties for this sort of crime have now rebranded, re-strategized and operate on a bigger scale using sophisticated crime network (Essien, 2015). Through the lens of critical thinking and analysis, there is a renewed attention, spirit and focus on the subject matter of cyber security in contemporary societies and Africa is not an exception. This lends credence to the fact that promoting a culture of cyber security and its interconnected disquiet is imperative for the African continent. This is because the African continent is collectively vulnerable and no country can tackle the question of cyber security alone (Atta-Asamoah, 2010).

Practically speaking, the main objective for cyber security initiative in Africa is to make safe the online security of the African cyberspace. This, on a more practical

Table 3. Estimated loss through cyber fraud in Africa annually

	Type of crime	Amount	%	Indirect cost	Type of crime	Amount	%
Direct cost	Insider Threat	$179m	50%		Insider Threat	$107m	20%
	Attacks on Computer Systems	$79m	22%		Attacks on Computer Systems	$155m	29%
	Social Engineering and Identity Theft	$36m	10%		Social Engineering and Identity Theft	$102m	19%
	Email Spam & Phishing	$25m	7%		Email Spam & Phishing	$64m	12%
	Data Exfiltration	$25m	7%		Data Exfiltration	$54m	7%
	Online Fraud Scams	$14m	4%		Online Fraud Scams	$54m	10%
Total $358m				**Total$537m**	**Overall total**	**$895m 100%**	

Sectoral loss to cyber fraud in Africa			
Banking & Financial Services	(a) Banking malware, (b) ATM Skimming (c) Insider threat, (d) Investments in technologies to detect, and prevent cybercrimes such as Antivirus etc., (e) Audit and compliance with regulators	**$206m**	**23%**
Government	Cybercrime to African Governments activities and services such as: (a) Tax fraud, (b) Benefits fraud, (c) Local-government fraud (d) Website defacements and, (e) Ransom demands	**$170m**	**19%**
E-Commerce	(a) Online fraud, (b) Credit card fraud (c) Social Engineering	**$143m**	**16%**
Mobile based transactions/ e-commerce/e-payment	(a) Malware, (b) Social Engineering (c) Insider Fraud	**$116m**	**13%**
Telecommunications		**$98m**	**11%**
Hospitality		**$90**	**10%**
Other Sectors		**$72m**	**8%**
Total		**$895m**	**100%**

note is to enable African countries enjoy the full benefits of the cyberspace as a springboard toward investing on human capacity development of all citizen. It is apparent that the continent of Africa which consists mostly of underdeveloped and developing countries is characterised by a limited awareness, knowledge, expertise and understanding of cyber security phenomenon (Chetty, 2007). There is no gain

saying the fact that the rest of the world needs Africa to be aware and ready for cyber security. We are all connected in cyber space and our collective security is linked through either being hosts or targets of crime and attacks. This being the case, Africa can only be aware and ready for cyber security if and when it is internally organised and collaborated effectively with the rest of the world.

Currently, the African continent is particularly vulnerable to cyber security threats largely because of vast increased bandwidth that is attempting to bridge the "digital divide" for economic and social developments (Chetty, 2007). There is no mincing of words that lack of security awareness which includes shortage of local cyber security experts, and most importantly lack of funds, clearly justifies the need for cooperation for cyber security.

Ethical Implications of Cyber Security in the 21st Century

The question of ethics as the moral principles that govern human behaviour is a critical element of any sound cyber security defence strategy. Ethics have an important role to play in the promotion of collaborative effort toward social wellbeing and sustainable development in every society. This is because, security habits need to be formed which can hold people personally accountable and responsible for every actions or inactions performed in the society even when the leaders are impervious and/or circumstance changes (Hoggman, 2000). For instance, in order to achieve a cyber secure society for all, certain policies, actions and inactions required to be exposed to some ethical scrutiny and critical thinking by asking the following questions: In the society, is living an ethical life all about doing one's duty (Deontological Ethics), or is it about bringing as much utility and happiness to one's family relations and friends or as possible for all concerned (Utilitarian ethics), or is it about following the natural law (Natural law ethics), or is living an ethical life about living up to the social contract that we have signed on to (social contract ethics), or is it about flourishing; that is maintaining and achieving well-being by developing excellent traits and characteristics (virtue ethics)? Certainly, the association between cyber security and matters such as knowledge sharing, responsibility, transparency, justice, and cooperation are all ethically based, and relates to the need for all stakeholders to make informed choices in the process toward securing the cyberspace for sustainable development (Fuchs, 2009). Although the ethical element promoting information technology and cybersecurity is one of many other variables that should underlie a sustainable development policy, it is however considered as fundamental, in the context of digital economy. This is simply because it is associated with a set of values that should be upheld to promote the happiness of the current and future generations. In this regard, the issue of responsibility, protection, cooperation, accountability,

truthfulness, and care towards the present and future generations deserves to take a centre stage (Dutton, 2001).

Cyber security is not only a matter of technology alone but also one of morality. It is particularly important for those in the cyber security business to act ethically given the understanding that cyber security is a process of making safe, secure, and reliable, the cyber space for its social and economic wellbeing advantages (van Dijk & Hacker, 2003). As a process, cyber security requires some ethical obligations which define a moral course of action. This presupposes that considering the importance of modern technology, many organisations are supposed to commence imposing ethical cyber security obligations to their members. In ethics of cyber security, the IT security professionals have a very challenging job to handle especially when it comes to cybercrime (Dobson & Willinsky, 2009). Not only must the professionals guard against attacks, but they also must contend with other ethical issues such as privacy, reading of people private emails, monitoring the social media activity of others, capturing the keystrokes of everything an employee will type, as well as the reading of files stored on employees' machines. Within the corporate sphere, some of the methods used in helping to ensure the safety of data will certainly provoke ethical questions. This includes everything ranging from customer and employee information to financial records and product specifications. This is essential as personnel working in the IT industry are expected at best to be every bit as ethical just as the hackers are very unscrupulous in their nefarious activities (Jenson, 2001).

RECOMMENDATIONS

Given the complex nature as well as the magnitude of cyber security challenges in African continent in contemporary time, tackling the phenomenon requires a coordinated and well-focused policy. However, the composite character of the issues demands a multidisciplinary dimension in tackling the menace. The interaction between these dimensions nonetheless, reinforces the delicate and complex nature of cyber security which is apparent in our societies nowadays. The following recommendations will suffice for the problem:

1. There is a need for governments at the continental level to create institutional capacity to respond to cybercrime and threats. This will involve setting up a minimum standards and procedures in tackling cyber security issues to enable the continent to obtain the full benefits of the cyberspace. The establishment of the necessary cyber security organisational structures with regional responsibility to curb cyber vulnerabilities is pertinent.

2. The role of governments in putting in place the policy, legal and regulatory framework is of paramount importance. This is because the success of any cyber security initiative requires the full involvement and support of the political leadership and goodwill at the very highest level. Having regional frameworks, policies and strategies relating to cyber security are imperative for African countries. This is because they will allow stakeholders to use the technical, legal and regulatory tools available to promote a culture of cyber security concerns.
3. Cyber security awareness and training ought to be a top priority for all African. Security awareness is the most important requirement for cyber security. It should be made to reach all levels and inform all users of the Internet, from vulnerable sector or people in the society, school-going children to families, industry captains, critical national infrastructures handlers, government officials, and the entire African continent with its unique needs.
4. Employment and empowerment opportunities should be given a top consideration in order to cater for the large population of the youths who have finish school but remain jobless. Job security must be seen as a sine-qua-non for a functional cyber security in Africa. Effective cyber security involvement also has the capacity of creating job opportunities.
5. The coordination of local as well as international partnerships on cyber security is apt. This will foster cooperation and coordination between governments, stakeholders, private sector and citizens in engaging cyber security in order to promote and strengthen international cooperation.
6. The governments in Africa should engage in rigorous dialogue with others, especially among the academic community, and major stakeholders aimed at establishing a common understanding of the problem of cyber risk and vulnerability.
7. Cyber security issues in the continent should constitute a broader range of the African bilateral relations programme.
8. The Governments in Africa should make a concerted effort to establish one or more dedicated support funds under specialised and professional management to support the financing of cyber security innovation, targeting cases where innovation would have spill over benefits but might not otherwise be funded
9 The global nature of cyber security means that cyber security practice must take account of human, social, legal, regulatory and technological factors. The complexity of digital systems also means that the connections between the social, human and technological elements of a system themselves create opportunities for exploitation. Research challenges are therefore multidisciplinary, including the social sciences and humanities as well as engineering and the physical, mathematical and computer science.

CONCLUSION

This study mirrored expressly on the imperatives for deepening the security engagement and cooperation for cyber security in Africa. It noted that cyber security is today recognised as global phenomenon, and there is currently no continental coordination and cooperation on cyber security. The study tried to establish a different argument that to stay on track and become one of the major drivers of the global economy in order that the continent and her people can reach its full potentials, Africa needs to urgently address efforts to combat cybercrime and improve its cyber security posture. This however, raises some critical ethical challenges bothering on responsibility on the part of the various stakeholders to tackle cyber security in Africa. The current cyber threat landscape in Africa shows that users (Africans) are being enormously impacted upon both by threats that are trending globally as well as some that are more specific to the region. This study demonstrates that with the existing trend of cyber security, it will certainly take a concerted effort from international governments, civil society organisations, and institutions to fight cybercrime and improve cyber security in Africa.

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Chapter 3
Digital Marketing and E-Tailing Technological Innovations

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ABSTRACT

In an age of public mistrust of the most basic institutions, businesses are not exempted. Essentially all e-tailers want to deliver personalized and real-time communications to customers that are tailored to their interests and preferences, and are based on big data mining that customers will value over privacy concerns. This is an era in which e-commerce retailers continue to dominate the marketplace and it is integral that consumers are able to trust the manufacturers, retailers, and the service/product reviews that they read online. Such trust is particularly important if their ultimate purchase decision is a successful one. A survey of middle-level managers was analyzed to identity the basic elements: e-personalization, namely online purchasing behaviors, personalized communications, information-retrieval services, degree of personal web presence, quality assurance of customer service, and the promotion of customization services. These elements were found to be conceptually and statistically related to retailer benefits of increased buying and customer loyalty.

INTRODUCTION

Although the traditional relationship between buyers and sellers has changed little in 200 years, the role of technology in this relationship has changed greatly in the past 10 years, especially in communicating to customers and partners in the overall value

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chain. As suggested by Kim and Hahn (2012, p. 40), "fashion/brand leadership as not only one's involvement in and knowledge about fashion but also one's level of influence over peers in regards to selecting fashion products and brands related to being fashionable." Much of this leadership depends on the ability of management to use appropriate trends in technology to develop and maintain a competitive edge (Keng, Huang, Zheng, & Hsu, 2007; Komulainen, Mainela, Ta¨htinen, & Ulkuniemi, 2007; Smith, 2002, 2012a,b).

Many marketing researchers have examined the current strategies of marketing that are being used to target consumers in the current market from the more traditional print marketing (e.g., magazines, newspapers, and billboards) in comparison to the more modern use of digital marketing. Perhaps one of the best ways to reach consumers and create a campaign that create new customers' demand, as well as maintaining loyal customers, is to find the right combination of both digital and traditional marketing campaigns. Digital marketing, also known as online marketing, Internet marketing, and web marketing, is considered to be the targeted, measurable, and interactive marketing methods used to reach customers through a type of digital technology in order to create and maintain customers for either a good or service (Todor, 2016). Inbound marketing, while similar to digital marketing, is a more embedded marketing tool. Inbound marketing is when a company promotes it products or services through a blog, eBook, video, social media campaign, and podcasts. Digital and inbound marketing have many advantages in terms how and when they reach the consumer.

Digital marketing comes with many advantages as well as some disadvantages. A major advantage to digital marketing is that it is more cost efficient. When digital marketing campaigns are deployed on websites that generate traffic on their own, the cost to market on this website is much lower than it would be to use a marketing strategy that requires the campaign to drive its own traffic. The cost advantage also closely ties into the advantage that web can reach an unlimited number of consumers, whether the campaign be driven worldwide or locally. Another advantage to digital marketing is that the online user is generally in control of their exposure to the ad. This allows the user to turn off the ad if they are not interested, which reduces the chance that the ad will become associated with annoyance rather than a positive opinion. User controlled exposure is also great because it allows the consumer to immediately pursue the product being marketed to them. A huge advantage over traditional marketing that digital marketing has is that it is easily changed. Digital marketing can be adaptable almost immediately and either displayed or taken down with a matter of minutes. This is great for situations such as marketing sports championship apparel. Companies like Dick's Sporting Goods immediately switched their marketing from saying they had Pittsburgh Penguins Eastern Conference Championship memorabilia to Pittsburgh Penguins Stanley

Cup Champion memorabilia. Lastly, digital marketing can be made personal, or be directly at very distinct groups of people. This way the marketing budget is spent on those consumers who are the most likely to become or remain loyal customers.

There are disadvantages associated with digital marketing, especially the risk of copyright infringement. Marketing campaigns can easily be copied or be falsely created in order to defraud customers. Still, many consumers are still interested in seeing in person, touching, experiencing prior to making the actual purchase. It is a technological challenge to simulate the physical sensations some require as part of the purchasing process. Unfortunately, distrust in the Internet by many consumers has not diminished, especially in light of recent disclosures of disinformation and identity theft. Distrust affects the success of digital marketing because many people, particularly those who have had negative experiences previously and those from older generations are still not willing to purchase online (Keramati & Behmanesh, 2010; Kim & Tadisina, 2010; Marthandan & Tang, 2010; Viswanathan, et al, 2017). Many potential customers are skeptical of anything online that appears to be extremely "personal" and may be deterred by marketing strategies that are too tailored to them or that require them to make a purchase online using electronic payment and/or sharing financial information before purchase. Other customers, on-the-other-hand, may not be deterred by these approaches that may appear to be part of a "hard sell." As digital marketing evolves, the advantages will of convenience and speed will continue to grow, as the disadvantages are mended through new technological advances.

A number of researchers (Chang, Cheung, & Lai, 2005; Chaudhuri & Holbrook, 2001; Chen & Dubinsky, 2003; Chiou, 2004; Hollebeek & Macky, 2019) have examined the role of consumer trust and its possible impacts on traditional marketing as well as some of the forces that might prevent it from being a superior choice for promoting certain brands. Traditional marketing is categorized as marketing delivered through tangible items such as print ads from newspapers or magazines, business cards, commercials delivered through radio or television, billboards, posters, and brochures. Traditional marketing however is not limited to these examples as it includes anything that is not considered to be digital marketing. Traditional marketing has an ability to produce fast results. Traditional marketing ads that are placed well for their targeted audience often have the ability to reach the audience faster than digital marketing which could take a few weeks to reach the audience. An example of this is with sales flyers. A store that displays its sales flyers in the entrance is more likely to reach the audience than they would if they only posted their flyer digital online. The other main advantage listed is trust. With so much mistrust and misuse online, traditional marketing is generally more widely accepted by those who are skeptical of digital marketing. Traditional marketing reduces many opportunities for fraud to occur making it a safer option for consumers.

While traditional marketing does have advantages, it has some disadvantages. A disadvantage and deterrent for companies looking at using traditional marketing is the cost. In most cases, traditional marketing comes with a significantly higher price tag than digital marketing. Another disadvantage of traditional marketing to digital marketing is the ability to customize. Without the ability to customize, traditional marketing is simply using general information and feeding it out to consumers in hopes that it will reach the right individuals.

The ultimate recommendation made by Todor is to find a balance between the use of traditional marketing and digital marketing. While consumers are increasingly becoming more involved with the internet and often exposed to digital marketing, traditional marketing still has much to offer in order to balance the advantages and disadvantages of both strategies. Although it is fairly obvious that digital marketing is overtaking traditional marketing, there are others who believe that the balance is essential and may eventually slow down digital marketing.

The numerous advancements in e-personalization communication have generated both benefits and challenges as online retailers try to regain competitive advantages in the global marketplace. Undoubtedly, much of the communication and the technology that supports the social webs and sharing of large data exploration are highly dependent on the ability of companies to keep privacy concerns by customers to a minimum (Lee, Lee, Lee, & Park, 2015; Stead & Gilbert 2001). Previous researchers (Blake, Neuendorf, & Valdiserri, 2005; Bourlakis, Papagiannidis, & Fox, 2008; Brynjolfsson & Smith, 2000; Fiorito, Gable, & Conseur, 2010; Viswanathan, et al, 2017) have examined the typical roles of retail buyers and explored how these roles have changed due either to the type of retail store or the role technology has played in the job function. Kim and Hahn (2012) investigated the how the personal traits variables and their effecst on Generation Y consumer's attitude toward using mobile devices for communication as well as for the shopping. There were three variables under the personal traits (e.g., high involvement, experiment productivity and fashion/brand leadership) and three theories (e.g., Stimulus-Organism-Response, Uses and Gratification Theory and Technology Acceptance Models) to investigate consumer behavior on mobile communication and commerce. Essentially, their study personal traits variables that positively influenced younger consumers' attitude to using mobile devices to communicate and shopping (e.g., exogenous variables were including high-tech involvement, experiment proclivity, and fashion/brand leadership and endogenous constructs were including perceived ease of use, perceived usefulness, perceived enjoyment, attitude towards using the mobile devices for communication, and attitude towards using mobile devices for commerce). Specifically, Smith (2006, 2011, 2012b) examined the various uses of knowledge-technology in regards to e-personalization which today's retail buyers have become dependent, especially in the face of ever tighter profit margins. Therefore, the basic purpose of this research

effort is to help retail practitioners identify areas of improvement for retail buyers, especially in the examination of customization via electronic means and customers over satisfaction.

Keng, et al. (2007) and Komulainen, et al. (2007) have suggested various avenues through which technology has changed in retailing and the impact it has had on the supply chain. From the early beginnings of data mining and data warehousing, the basic foundation for customer relationship management (CRM) systems were laid down (Kyoung-jae, 2011). CRM-embedded systems allow buyers to analyze consumers' buying behavior for the purpose, as it relates to operations, of forecasting future demand for products. Data mining is the analysis of the information and data warehousing is the store of such customer-related data. One of the major functions of CRM is to understand customers' behavior, even down to an individual or personalized level via enhanced and sophisticated algorithms. This technology has greater implications for marketers than for operations personal.

Fiorito, et al. (2010) documented the usefulness of data mining when used in conjunction with point-of-sale (POS) systems. POS has been the evolution of the once humble cash register into a mighty data collector. Retail buyers are able to mine the data from POS to predict consumer trends or identify stock movements in relation to store layout just to name a few. This analysis can be used by retail buyers to customize store layouts in an effort to make products more accessible to their customers. Perhaps, one of the biggest boosts to efficiency through technology for retail buyers comes from electronic data interchange (EDI).

EDI allows retail establishments and their suppliers to communicate in real time. All partners in the supply chain are fully aware of what products are moving, when inventory needs replenishment, and can react quickly to inventory issues. This process has automated a key function of the retail buyer. This automation has not eliminated the need for this position, instead through efficiency it has freed retail buyers up to concentrate on other tasks. EDI has major implications for the supply chain.

Much of the recent advancements in retail communication technological advancements have been made in the area of inventory management systems, notably automatic identification and data capture systems, especially barcodes and radio frequency identification (RFID) (Smith, 2012a). These technologies are most notably used for inventory tracking, as bar codes allow for quick scanning which can easily register all the vital information of products. RFID takes this a step further by allowing data transmission through radio frequency. This can be used to track the location of inventory, whether in a warehouse or on a sales floor. The same technology can be used in loss-prevention which directly effects to retailers' bottom line. RFID tags also collect data as the product moves off the shelf and toward the cash register, helping retail buyers and planners develop the most effective layouts. For example, Wal-Mart's implementation of its RFID system has saved the world's

largest retailer US$6.7 billion in labor costs alone (Fiorito, et al, 2010). This should be enough to pique the interest of any OM practitioner.

The development of automatic replenishment systems have been developed to assist retail buyers in finding the balance between overstocking (tied-up capital, waste) and under-stocking (lost sales.) This balance has become increasingly difficult as product variety has increased and product life cycles have decreased. Some of operational techniques/technologies that have direct impact to retailing include quick response, efficient consumer response, just-in-time and collaborative planning, forecasting and replenishment. All these techniques have been geared toward the most efficient use of capital when it comes to inventory and the most effective communication between the supply chain partners. These technologies have a direct effect on the profitability and the efficiency of the supply chain.

Palmisano, Tuzhilin, and Gorgoglione (2008) and Fiorito, et al. 2010) highlighted some emerging technologies and their potential impact on retail buying, such as e-showrooms and social media. Several researchers (Pappas, Giannakos, & Chrissikopoulos, 2013; Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2014; Pappas, Pateli, Giannakos, & Chrissikopoulos, 2014; Smith 2012b), have suggested that in the more traditional brick-and-mortar retailing, the focus of personalization was on social interactions among the various service employees and their customers to generate positive psychological responses. However, with the wide acceptance of social networking and large warehousing of transactional data that can be cross-linked to consumer purchase patterns, coupled with sophisticated predictive algorithms, the e-experience can be just as rewarding to potential customers. Essentially, e-showrooms allow retail buyers a virtual opportunity to browse entire collections via the Internet where they traditionally would have had to travel to an established trade market. While this technology limits the retail buyer from experiencing the texture of the item, it can highlight all other aspects of the product. Such technologies can provide significant time and cost savings for potential customers, since buyers do not have to travel to market this saves time and travel expenses.

Customer loyalty and retention has been recognized as one of the important factors in creating profitability for companies, especially within the e-commerce environment (Smith, 2002; Wu & Lin, 2006; Yang & Lester, 2004; Yang & Jun, 2002; Yang & Peterson, 2004). However, in online environments, it is more complicated in establishing a social connection between firms and customers due to the lack of physical environments, social distances between companies and customers (Glaser, Radjawali, Ferse, & Glaeser, 2010; Olaru, Purchase, & Peterson, 2008; Overby & Lee, 2006; Schijns, 2003; Soltanifar, Ebrahimnejad, & Farrokhi, 2010) and anonymous and automated shopping contexts (Head, Yuan, & Archer, 2001; Park, Lee, & Han, 2007). Furthermore, consumers can compare competing products and services

with minimal expenditure of personal time or effort, which results in competitive business markets and lower brand loyalty (Park & Lee, 2009; Srinivasan, Anderson, & Ponnavolu, 2002).

PURPOSE OF THE PRESENT STUDY

The purpose of this chapter is to discuss the advancements in online personalization communication as well as new challenges that face online retailers by citing examples of e-tailers that are successfully using these new personalization techniques to overcome the challenges that they face. The research that is reported in the present research deals with the perceptions that middle-level managers have about the customers' preferences that their company directly serves. It is to be made clear at this point in the research that these middle managers are answering the survey questions in the experiential portion not as customers themselves, but as managers giving expert information on what they had experienced about customer behavior. This point was stressed and explicitly in the methodology section. The role(s) of the respondents in relation to the research design and the perspective of their answers are from the perspectives of their knowledge concerning their customers' behavioral patterns.

It is hoped that through appropriate data-reduction techniques, the basic elements of online purchasing behaviors, personalized communications, information retrieval services, degree of personal web presence, quality assurance of customer service, and the promotion of customization services can be shown to be conceptually and statistically related to retailer benefits of e-personalization; namely, e-personalized features are designed to increase buying and creates customer loyalty. The basic elements of customer relationship management (CRM) (Adelaar, Bouwman, & Steinfield, 2004; Anderson & Srinivan, 2003; Jun, Yang, & Kim, 2004; Kalyanam & McIntyre, 2002; Keng, et al., 2007) will serve as the basis for the exploratory segment of the present research. Ultimately, if the empirical section proves worthwhile, the present study should conclude with some tactical recommendations to promote continued growth in light of the current economic downturn through the use of e-personalization and improved customer service at the retailer level.

E-PERSONALIZATION IN RETAIL ENVIRONMENTS

Online Communications

Rayport and Jaworski (2004) discussed 4 online marketing communication frameworks and the role they play in online marketing strategies. The four frameworks

include personalized online communications, general online communications, traditional mass marketing and direct communications. These frameworks are used to attract and retain customers. For the purpose of this paper, the focus will be on personalized communications include the following: personalized permission e-mail, personalized recommendations, personalized advertisements, personalized web pages, and personalized e-commerce stores (Devaraj, et al., 2002; Eroglu, et al., 2003; Forsythe & Shi, 2003; Gommans, Krishman, & Scheffold, 2001). In order to utilize a personalized online communication strategy, basic customer preferences must be determined. This information can be collected from customers who register their preferences and demographic information or by analyzing past purchases and web surfacing habits.

Once this information is collected, online retailers are more able to develop successful marketing strategies that are specifically targeted to each individual consumer and related segment. The following sections concentrate on personalized permission e-mail, personalized recommendations, and personalized e-commerce stores.

Personalized Permission and Recommendation

Personalized permission e-mail allows an online organization to contact a consumer, with the consumer's permission, via e-mail with merchandise recommendations that are targeted directly to that consumer based on previous shopping patterns. Some consumers appreciate these targeted e-mails because it gives them direct access to merchandise that they may be interested in purchasing – as a result, it improves the relationship between the consumer and the e-tailer (Smith & Faley, 2001; Srinivasan, et al., 2002; Swinyard & Smith, 2003; Viswanathan, et al, 2017). Personalized recommendation services, on-the-other-hand, suggest merchandise to consumers should be based on past purchases; website pages viewed, and survey information that the user has provided. It is hoped by management that these services, via relatively sophisticated algorithms, will help determine the products/services that might be of greatest interest to particular targeted customer segment.

Through appropriate data mining of past purchase behavior and future trends, e-tailers can provide timely and useful this information, so that customers may take advantage of these recommended products/services (Santos, 2003; Seiders, et al., 2005; Shankar, Smith, & Rangaswamy, 2003). If executed properly, successful product/service recommendations can increase revenue and retain customer loyalty.

Personalized E-Commerce Stores

As suggested by Rayport and Jaworski (2004), Tsai, Huang, Jaw, and Chen (2006), Warden, Wu, and Tsai (2006), and Weisbaum (2007), online merchants strategically leverage web-enabled technology, as well as knowledge about individual consumers, to tailor their products and service for each customer (Shibata & Saiki, 2010; Vuori & Piik, 2010). Since the products of interest are featured primarily, it makes the shopping experience for consumers more enjoyable. Personalization is also a key tool for increasing customer retention and loyalty. If a customer is satisfied and becomes dependent on a website that offers personalized services, it will be more difficult for the customer to switch websites. The following sections briefly discuss how personalized permission e-mail, personalized recommendations, and personalized e-commerce stores can be used in the e-marketplace.

TACTICS FOR INCREASING WEB-BASED PERSONALIZATION

Importance of Customer Service

The increasing lack of effective customer service available at e-tailers' websites is becoming a growing problem for e-tailers. As will be discovered in the empirical section of the present study, only 8% of respondents were always able to easily locate customer service contact information and only 16% of individuals surveyed said they are satisfied with customer service when they have to call for such service. According to Bourlakis, Papagiannidis, and Fox (2008), many people avoid shopping online because of the perceived time/convenience risk, which refers to the loss of time and lack of convenience incurred due to web-navigation and/or submitting orders, finding appropriate websites, or delays in shipping products. Necessary changes must occur in order to eliminate, or at least reduced, this perceived risk if retailers are to win back frustrated consumers who have been neglected during previous online shopping experiences.

Weisbaum, (2007) cited a recent Harris Interactive Survey that found that a large portion of respondents that conduct web-based business have a less than favorable experience, which generates frustration and many have stated that they are unwilling to deal with e-commerce sites that fails to meet their expectations. If e-tailers do not make adjustments to their customer service strategies they will not only jeopardize sales, but they may permanently lose customers. Also cited by Weisbaum (2007), in a separate survey conducted by Tealeaf Technology, a company that sells software that allows companies to see how users are interacting with their site, 87% of those who do business online have experienced problems. Common

problems include difficultly logging on, problems navigating the website, receiving error messages, getting removed from the current page, and/or getting caught in endless loops. Another trying aspect of online shopping for consumers is dealing with nonproductive and frustrating customer-service calls. In the Tealeaf survey, for example, 53% who have had experienced a problem online tried to complete the transactions by contacting customer service, but almost 50% of the time they found that customer service could not resolve the issue.

Another alarming statistic is the majority of customers (68%) felt that the service agent was not knowledgeable about the company's website. This is certainly an unwelcome statistic as many companies spend a large amount of money on obtaining customers; however, perhaps some of these same organizations do not give their customer service agents the proper training and tools to keep their customers happy by solving their problems. The result of poor training and insufficient tools for CRM-based initiatives, customers' retention efforts suffers. Talisma Corp., for example, conducted a mystery shopper exercise from May to June 2007 in which the top 100 US online retailers were asked via e-mail what credit/debit card they accepted and what they charged for shipping. About a third of those e-mails were not answered, and even when the company responded, 49% of responses contained inaccurate information. This inaccuracy is a major problem that e-tailers need to solve immediately, as Weisbaum (2007) found, 42% of Internet users who run into these issues will give up and leave the website, resulting in a loss sale for that e-tailer.

Pairing Customer Service and Personalization

Based on some of the statistical evidence discussed, an e-tailer's lack of concern for customer service can result in significant loss of sales; by concentrating on customer service, companies have the potential to generate significantly more sales and build a much more loyal customer base. Customer Service can be enhanced with the use of personalization. According to Kalyanam and McIntyre (2002), very few organizations can form an effective marketing strategy without blending e-marketing tools with a traditional marketing mix. As compared to the elements of the conventional marketing mix, the new e-marketing mix inherently has more overlapping elements, which directly represents segmentation personalization as a basic function or requirement. Online retailers are now enhancing their traditional customer service capabilities by using new personalization tools. By pairing e-personalization tools with customer service techniques, customers generally will feel more confident with their purchase knowing they are able to track their order in case of a problem, as well as promote future purchases with product recommendations (Yoo, Lee, & Park, 2010).

METHODOLOGY

Sample Characteristics

To explore the concepts of the customers' value of e-personalization benefits from the viewpoint of retail management, a basic survey instrument was developed for exploratory purposes. For this particular research project, a 24-question survey was developed asking a sample of middle-level managers of a large, soft goods and related items store chain headquartered in Pittsburgh, PA that are deeply involved in tailoring e-commerce initiatives to increase customer retention and loyalty. Table 1 is a listing of the basic set of questions, of which the quantitative variables were extracted and used for the data-reduction analysis. Empirical research was conducted to test the following the importance of e-personalization features previously discussed in relation to promoting the benefits of such customized efforts, namely customer satisfaction, retention, and loyalty, as viewed from managers' perceptions of their customers' preferences. It was further assumed that there is a high correlation between browsing rates and purchasing rates, and that there is a general need in the retail industry to improve customer service offerings. The majority of the survey was comprised of both scale and nominal intervals that simplified the use of the statistical software as survey results were recorded and later used to formulate graphs, and perform data-reduction analyses.

With this in mind, a survey instrument was pre-tested for minimum execution time and confusion and maximum accuracy of the concepts developed from the model and conceptual map previously presented. The survey was created primarily from a review of business practitioner and academic literature in order to try to understand how well-educated marketing professionals perceived the general benefits of their e-customization efforts from a CRM-based perspective. This procedure resulted in 50 completed interviews from a potential sampling frame of 83 lower-to-middle retail managers, derived over a three-month period.

Statistical Techniques

The dominant statistical techniques used in the present study were multiple regression techniques and data-reduction techniques. The *F*-test was used to test the statistical significance of the relationships determined from the data-reduction process, based on the Principal Components Analysis and factor-analysis results. The *F*-test is one of the most frequently used tests of significance in such managerial inquiries. An *F*-test, like the *t*-test, is very robust and relatively insensitive to violations of the assumptions of random selection of subjects and normal distribution of the variables (Kim & Mueller, 1978; Pedhazur, 1997). Indeed, many of the underlying assumptions

for both the *F*- and *t*-tests could be violated with very little effect on their accuracy. It is important to recognize, however, that in cross-level investigations (Hofmann, 1997; Hofmann & Gavin, 1998), individuals (managers) within the same group (retail soft goods industry) are all exposed to similar group stimuli and are likely to be more similar to one another than individuals in other groups.

Multiple linear regression (MLR) and factor analysis techniques can invaluably serve the researcher in testing relationships between categorical variables, between categorical and continuous variables, or between continuous variables (Cohen and Cohen, 1983). This research effort was based on a combination of continuous and discrete variables, which multiple linear regression and factor analysis techniques can handle very effectively. The weighting coefficients can be interpreted as in multiple regression or factor analysis and a significance test is included in the appropriate modules of SPSS (Green & Salkind, 2003). The survey questions that were used may be at least partially derived from the descriptive statistics, frequencies, and related statistical techniques found in Tables 1 through 8, which are the bulk of the quantitative survey questions contained in the data collection process and ultimately used in the analysis portion of the present study.

RESULTS AND DISCUSSION

Descriptive Comparisons

As the basic thrust of the empirical research section of the present research was to study consumer behavior in retail settings, professionals at the middle management levels, with backgrounds in retail sales, purchasing, procurement, and project management, were personally interviewed, using a series of questions. The items that were quantitative, not nominal, as defined in Table 1, were designed to gauge some of the major factors that influence e-personalization attributes of established retailers. These questions range from degree of personal Internet usage and online shopping behaviors, to the online purchase experience (perceived importance of personalized e-mails, greetings, product suggestions, follow-up communications, customization initiatives, uses of e-personalization features to increase buying, customer loyalty, willingness to give personal information, access to customer service, ease to find customer service contact information, contact with customer service, degree of satisfaction with customer service), as well as selected demographic information. The basic theoretical approach was from customers' value-added, via professional retailers' viewpoint.

Tables 1 and 2 display cross-tabulation and Chi-square, as well as selected statistics and correlations of the marketing professionals' responses to the quantitative

variables derived from the interview, respectively. In terms of demographics, 92% held college degrees, slightly more males (56%), and 62% over the age of 30 years. As evident from an inspection of the table, in terms of web-enabled sophistication, the majority of respondents frequently used the Internet for personal use (1 = never, 5 = daily) (mean of 4.76), browsing online for information for personal use (4.14), and moderately used online shopping for personal purposes (2.78). There was perceived that customers did not offer strong support (1 = not important, 4 = very important) for personalized e-mails (1.76), personalized greeting (1.64), product suggestions (2.12), and willingness of customers to give personal information (1.98). There was considerably more positive support for the importance of follow-up communications (2.98), customer customization (3.46), e-personalized features likely to increase buying (2.18), and e-personalization creates customer loyalty (2.12). Cross-tabulations (Table 1) of important to buy industrial products online with save time and money by purchasing products online with custom items through online websites were found to be highly significant and relevant (Chi-square = 28.401, $p < .001$). In terms of correlations, there were significant relationships among degree of purchases per week online and important to buy industrial products online ($r = .332$, $p = .019$) and work-related purchases online through supplier websites ($r = -.453$, $p < .001$); as well as an inverse relationship pf save time and money by purchasing products online with save time and money by purchasing single supplier ($r = -.360$, $p = .010$), suggesting that multiple suppliers are needed in an increasing complex and personalized commerce.

The majority of people browsed the following products: Books, magazines, movies, music (86%), travel (84%), apparel (76%), events (62%), and sports and fitness items (56%). The majority of people purchased the following products (which was strikingly similar to the frequency of products and/or services browed): Books, magazines, movies, music (86%), apparel (76%), travel (76%), and events (60%). Based on these results, people who browsing for certain items online, also purchase those same items online, as a result, it would be very important that an e-tailer create and maintain an enjoyable browsing experience to keep customers coming back.

An attempt was made to determine which personalization features, regardless of onsite or online) for their company were most important to the retail managers surveyed. The personalization features measured included e-mails with product recommendations based on previously shopping experience, onsite greetings, on-site product recommendations while shopping, post-purchase follow-up e-mail with receipt and product customization. Participants had to determine whether these features were not important, somewhat important, important, or very important to their customers' online shopping experience. The most important feature for online shoppers is product customization, with 46% felt that having the having the capability to customize a product based on their customers' unique needs or preferences,

Table 1. Cross-tabulations of Important to buy industrial products online with Save time and money by purchasing products online with Custom items through online websites.

A. Actual count.

Custom items through online websites			Save time and money by purchasing products online				Total
			Disagree	Neutral	Agree	Strongly Agree	
Strongly Disagree	Important to buy industrial products online	Disagree	2	0	0	0	2
		Neutral	2	0	6	4	12
		Strongly Agree	2	0	0	0	2
	Total		6	0	6	4	16
Disagree	Important to buy industrial products online	Disagree	0	2	4	0	6
		Neutral	0	2	12	0	14
		Agree	0	0	2	6	8
	Total		0	4	18	6	28
Neutral	Important to buy industrial products online	Neutral	0	2	0	0	2
		Agree	0	0	2	0	2
	Total		0	2	2	0	4
Agree	Important to buy industrial products online	Agree	0	0	2	0	2
	Total		0	0	2	0	2
Total	Important to buy industrial products online	Disagree	2	2	4	0	8
		Neutral	2	4	18	4	28
		Agree	0	0	6	6	12
		Strongly Agree	2	0	0	0	2
	Total		6	6	28	10	50

B. Chi-Square test results.

Custom items through online websites		Value	df	Asymptotic Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Strongly Disagree	Pearson Chi-Square	8.889	4	.064 (NS)		
	Likelihood Ratio	10.357	4	.035 (S)		
	Linear-by-Linear Association	.577	1	.448 (NS)		
	N of Valid Cases	16				

continued on following page

Table 1. Continued

A. Actual count.								
Custom items through online websites			**Save time and money by purchasing products online**				**Total**	
			Disagree	**Neutral**	**Agree**	**Strongly Agree**		
Disagree	Pearson Chi-Square	20.593	4	>.001 (HS)				
	Likelihood Ratio	21.840	4	>.001 (HS)				
	Linear-by-Linear Association	12.203	1	>.001 (HS)				
	N of Valid Cases	28						
Neutral	Pearson Chi-Square	4.000	1	.046 (S)				
	Continuity Correction	1.000	1	.317 (NS)				
	Likelihood Ratio	5.545	1	.019 (S)				
	Fisher's Exact Test				.333 (NS)		.167 (NS)	
	Linear-by-Linear Association	3.000	1	.083 (NS)				
	N of Valid Cases	4						
Agree	Pearson Chi-Square	.[a]						
	N of Valid Cases	2						
Total	Pearson Chi-Square	28.401[a]	9	>.001 (HS)				
	Likelihood Ratio	24.677	9	.003 (HS)				
	Linear-by-Linear Association	1.320	1	.251 (NS)				
	N of Valid Cases	50						

a. No statistics are computed because Important to buy industrial products online and Save time and money by purchasing products online are constants.
Using the asymptotic standard error assuming the null hypothesis, HS denotes significant at the .01 level for a 2-tailed test.

Part C. Symmetric measures.

Custom items through online websites			**Value**	**Approx. Sig.**
Strongly Disagree	Nominal by Nominal	Contingency Coefficient	.598	.064 (NS)
	N of Valid Cases		16	
Disagree	Nominal by Nominal	Contingency Coefficient	.651	>.001 (HS)
	N of Valid Cases		28	
Neutral	Nominal by Nominal	Contingency Coefficient	.707	.046 (S)
	N of Valid Cases		4	
Agree	Nominal by Nominal	Contingency Coefficient	.[a]	
	N of Valid Cases		2	
Total	Nominal by Nominal	Contingency Coefficient	.602	>.001 (HS)
	N of Valid Cases		50	

a. No statistics are computed because Important to buy industrial products online and Save time and money by purchasing products online are constants.

Table 2. Correlations of selected variables dealing with B2B purchase behavior.

Statistics		Important to buy industrial products online	Save time and money by purchasing single supplier	Work-related purchases online through supplier websites
Degree of purchases per week online	Pearson Correlation	.332*	-.257	-.453**
	Sig. (2-tailed)	.019	.072	.001
	N	50	50	50
Important to buy industrial products online	Pearson Correlation	1	.019	-.084
	Sig. (2-tailed)		.894	.561
	N	50	50	50
Save time and money by purchasing products online	Pearson Correlation		-.360*	.070
	Sig. (2-tailed)		.010	.629
	N		50	50
Save time and money by purchasing single supplier	Pearson Correlation		1	.206
	Sig. (2-tailed)			.152
	N		50	50
Work-related purchases online through supplier websites	Pearson Correlation			1
	Sig. (2-tailed)			
	N			50

* Denotes significant at the .05 level for a 2-tailed test. ** Denotes significant at the .01 level for a 2-tailed test.

such as selecting materials, colors, sizes, to name a few, was very important. The second highest ranked feature was receiving a post-purchase follow-up e-mail with receipt information, as 38% of managers felt this was very important; and 44% felt that onsite product recommendations were important. The least important feature to customers was receiving a personalized onsite greeting, with 52% of managers suggested that an onsite greeting was not important, while 44% e-mails with product recommendations based on previously shopping experience were only somewhat important. Based on these responses, it seems that these e-tailers trends to focus on developing their onsite customization capabilities as well as post-purchase follow-up e-mails. Although personalization was important by essentially all participants, it was found that through their managerial experiences; about 40% of customers were not willing to provide e-tailers with personal information such as name, e-mail address, and home address.

It was found that customer service is very important to online shoppers, with 70% of managers cited that having access to a customer service center that is readily

Table 3. Related data-reduction and statistics among factor loadings for the creation of the dependent-variable, factor-based e-personalization retailer benefits

Part A. Communalities		
Quantitative Dependent Variables	**Initial**	**Extraction**
e-personalized features to increase buying	1.000	0.820
e-personalization creates customer loyalty	1.000	0.820
Extraction Method: Principal Component Analysis.		
Part B. Component matrix		
Quantitative Dependent Variables	**Factor-based Components**	
	1	
E-personalized features to increase buying	0.906	
E-personalization creates customer loyalty	0.906	
Extraction Method: Principal Component Analysis.		

available to answer questions while shopping was very important to their customers. It was found that all the managers thought that it very important for their customers to receive a receipt post-purchase via an e-mail. However, only 8% of respondents stated that their customers felt that it was easy locate the customer service contact information; in addition, only 16% of individuals surveyed said that their customers were satisfied with customer service when they have to call. These statistics should be are quite disturbing to retailers, considering the high level of importance that customer service is to shoppers.

It is apparent that the recent credit crunch and recession has placed a renewed emphasis on acquiring the lowest price. Due in part to this diversity of behavioral and attitudinal patterns, the next two sections deal with cluster analysis and data reduction techniques, with specific hypothesis-testing procedures in order to determine test patterns of perceived benefits of e-personalization.

Factor-Analysis and Exploratory Results

In the search for validation of the major constructs that are most likely to be associated with e-personalization and its acceptability among retailer professionals from their viewpoints of what customers value in e-tailing, principal components and factor analyses techniques were selected as the dominant multivariate statistical procedures to be used in the exploratory segment of this research effort to highlight aspects of some of the constructs and propositions in the present study. Principal component analysis (PCA) is a classical linear transform statistical method, which has been

widely used in data analysis and compression (Bishop, 1995; Cumming, 1993; Oja, 1989). Factor analysis using PCA techniques computed the communalities and common grouped factors in terms of shared variance. The analysis was done by separating the variables into two subgroups; namely dependent (e-personalization retailer benefits) and independent, then completing the PCA techniques, followed by appropriate hypothesis-testing procedures. It is the basic research assumption of the present study that there are significant positive aspects of e-personalization (namely operational effectiveness, personalized communications, accessibility, information retrieval, tailored customization services, appropriate pricing, and technological sophistication), which are extremely attractive to retail managers, regardless of the present economic downturn. Table 3 displays the related statistics associated with the creation of the dependent variable, e-personalization retailer benefits, which consisted of the related variables of personalized features to increase buying and e-personalization creates customer loyalty.

As noted in Table 3, both variables loaded equally high and positive (0.906) into the dependent variable, probably a direct indication of the importance of e-personalization activities at the retailer level. Tables 3 and 4 contain the related statistics associated with the creation of the factor-based independent variables, with the communalities among factor loadings in Table 4 illustrate that there are 6 major groupings of data clusters among the independent variables for data-reduction purposes.

In terms of the independent-variable constructs, Table 5 presents evidence that the total explained variance from data-reduction techniques of major constructs was statistically significant. The independent factor groups were renamed to suit their description of the independent variables, which loaded into the groupings with at least 0.5 (highlighted in bold in the appropriate table) and were similar to the labels generated by theoretical constructs from the literature review. Table 5, Part A, demonstrates that the total explained variance from data reduction techniques of the 6 major constructs was 83.518%. Table 5, Part A lists these factor-based constructs as, in order of the greatest explained variance, Personalized Communications, Access and Age Factors, Online Purchasing Behavior, Information Retrieval, Personal Web Presence, and Customization Services. All of the aforementioned constructs are assumed to be directly or indirectly related to benefits associated with e-personalization from the e-tailer's viewpoint of what customers hopefully value.

Factor-Analysis Hypothesis-Testing Results

In the testing of these previously determined factor-based constructs to determine the most important considerations for management in its search for more sustainable pricing strategies, as a low-cost producer in is not considered a sustainable approach, premium pricing was used as the dependent variable. Table 6 illustrates the relevant

Table 4. Communalities among factor loadings results for the creation of the independent-variable factor-based constructs

Independent Variables	Initial	Extraction
Degree of personal Internet usage	1.000	0.928
Degree browsing online for information	1.000	0.948
Degree of online purchasing	1.000	0.825
Importance of personalized e-mails	1.000	0.820
Importance of personalized greeting	1.000	0.946
Importance of product suggestions	1.000	0.814
Importance of follow-up communications	1.000	0.609
Importance of customization	1.000	0.790
Degree of willingness to give personal information	1.000	0.884
Perceived importance of access to customer service	1.000	0.832
Degree of easy to find customer service contact information	1.000	0.858
Degree of contact with customer service	1.000	0.832
Degree of satisfaction with customer service	1.000	0.861
Age level	1.000	0.702
Education level	1.000	0.880

Extraction Method: Principal Component Analysis.

statistics associated with testing these independent constructs derived from PCA found in Table 5, with the dependent variable, factor-based e-personalization retailer benefits. As displayed Table 6, Part A, the model summary, a total variance in predicting the dependent variable was a very respectable 81.7% (79.1% adjusted). In terms of the hypothesis-testing results, the overall results were found to be highly significant ($F = 31.948$, $p < .001$); while, as shown in Part C that inspects specific contributions of each component in the hypothesis and not surprisingly, all but one independent factor-based constructs were found to statistically associated with the dependent variable, factor-based e-personalization retailer benefits.

For example, the Personalized Communications construct, which consisted the major loadings of independent variables shown in Table 5 of Degree of contact with customer service (0.821), Importance of product suggestions (0.712), Importance of follow-up communications (0.688), Importance of personalized e-mails (0.632), and Degree of willingness to give personal information (0.566), was found to be highly significant and positively related to the dependent variable ($t = 9.865$, $p < 0.001$), suggesting that personalized communications are highly related to the goals that retailers wish to accomplish via their e-personalization endeavors, as expected.

Table 5. Total explained variance explained and related data reduction statistics for creation of the independent-variable constructs

Part A. Total variance explained						
	Initial Eigenvalues			**Rotation Sums of Squared Loadings**		
Factor-based Components	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
Personalized communications	3.391	22.607	22.607	2.665	17.769	17.769
Access and age factors	2.665	17.770	40.376	2.436	16.239	34.007
Online purchasing behavior	2.129	14.195	54.571	2.310	15.397	49.405
Information retrieval	1.849	12.326	66.897	1.839	12.263	61.667
Personal web presence	1.403	9.355	76.252	1.687	11.246	72.913
Customization services	1.090	7.266	83.518	1.591	10.605	83.518
Extraction Method: Principal Component Analysis.						
Part B. Rotated component matrix.						
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.						

Not surprisingly, the construct, Access and Age Factors ($t = -2.617$, $p = 0.012$), was found to be negatively related to e-personalization's benefits to customers' initiative (probably suggesting that younger marketing professionals are more optimistic about the positive effects of their e-personalization effects). The constructs of Online Purchasing Behavior ($t = 8.142$, $p < 0.001$), Information Retrieval ($t = 3.990$, $p < 0.001$), and Customization Services ($t = 2.178$, $p = 0.035$), were found to be highly significant and positively related as how many professionals view the Internet and e-personalization, not just as a tactic to increase premium pricing. The factor-based independent variable that were not found to be statistically significant and positively related to the dependent variable of e-personalization retailer benefits was Personal Web Presence ($t = -0.755$, $p = 0.455$), perhaps suggesting that there is a market for high prices when customization and perceived higher levels of value among the customers.

Managerial Implications

Ultimately, the basic problem that this study is seeking an answer to the question: is e-customization is worth the managerial effort? Does all of the extra financial resources and data mining of large customer/transactional data sets really motivate people to want to buy products from a firm's webpage? Or do customers really

Table 6. Relevant statistics associated with exploratory testing results. Part A displays the model summary, Part B the overall results, and Part C inspects specific contributions of each component in the hypothesis (Dependent variable: factor-based e-personalization retailer benefits).

Part A: Model summary.			
R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
0.904	0.817	0.791	0.4569
Predictors: (Constant), Personalized communications, Access and age factors, Online purchasing behavior, Information retrieval, Personal web presence, and Customization services.			

Part B: ANOVA results.					
Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F-ratio**	**Significance**
Regression	40.022	6	6.670	31.948	>.001 (HS)
Residual	8.978	43	0.209		
Total	49.000	49			
Dependent Variable: Dependent Variable: factor-based e-personalization retailer benefits. HS denotes significant at the 0.01 level for a two-tailed test.					

Part C: Coefficients-testing results.					
Factor-based Independent Constructs	**Un-standardized Coefficients**		**Standardized Coefficients**	**t-test**	**Significance**
	B	**Std. Error**	**Beta**		
(Constant)	-1.418E-16	0.065		0.000	1.000
Personalized communications	0.644	0.065	0.644	9.865	>.001 (HS)
Access and age factors	-0.171	0.065	-0.171	-2.617	0.012 (HS)
Online purchasing behavior	0.531	0.065	0.531	8.142	>.001 (HS)
Information retrieval	0.260	0.065	0.260	3.990	>.001 (HS)
Personal web presence	-0.049	0.065	-0.049	-0.755	>.001 (HS)
Customization services	0.142	0.065	0.142	2.178	0.035 (S)
Dependent Variable: factor-based e-personalization retailer benefits. NS denotes not statistically significant at the 0.05 level for a two-tailed test; S denotes statistically significant at the 0.05 level for a two-tailed test, HS denotes significant at the 0.01 level for a two-tailed test.					

not care about management's efforts to analysis countless volumes of customer information in order to customize webpages to focus on perceived best products/services geared to a customer's previous purchase preferences; or, ultimately, are they only concerned about the cheapest price/value-added proposition? The art and science of e-customization must balance the needs of an organization's operations management decision area of design of goods and services with the ever-evolving

field of customer behavior. A literature review of personalization strategies was used to generate a survey instrument to examine the important characteristics of such programs from business professionals. The main issue the present research effort article was investigating selected attributes of the service of customizing the buyer's experience in order to make the webpage more attractive to the customer. It is an added service that costs more money, but if the value-added features result in enhanced customer satisfaction that can be translated to customer retention, loyalty, and more purchase of premium products/services, it is a position worthy of corporate attention. On-the-other-hand, if customers are not more likely to buy from a website because of such enhanced services on the long-term; it simply becomes a waste of valuable resources.

As evident from the exploratory analysis portion of the present study, the factor-based constructs of personalized communications, online purchasing behavior, information retrieval, and customization services are all positively associated with the perceived benefits of e-personalization at the retailer level. It is important to point out that during the interview process, virtual all managers emphasized the importance of building upon the concepts of trust and reputation earned by the traditional brick-and-mortar establishment in the construction of a responsive and success e-marketplace system. Hopefully, this seeks to electronically replicate the decision-making that humans do automatically via e-personalization. When a human is in the market for a good or service, varying degrees of research and comparison-shopping is performed, based on the item sought and the urgency need of the transaction. Typically, customers are apt to look at more vendors to find the best price, so the convenience of such comparison shopping should be built-in the e-personalization process.

Consumers generally need to be able to evaluate the vendor through a standardized checklist, such as cost of reverse logistics, payment options, product and/or service warranty, and creditability of the firm's customer support centers. Just as many consumers use word-of-mouth in their shopping activities by asking friends and reviewing blogs about stores and brands, e-tailers must create a reputation system to enable this kind of evaluation. The reputation system is based on several quantifiable factors, such as price, cooperative behavior, and meeting expectations. This trust/reputation method is similar to the rating system used by online traders and auction websites that allows buyers and sellers to evaluate prior feedback and make either become more comfortable or more wary based on a participant's rating.

There must be a structured approach that such a reputation-based system uses to evaluate action in the marketplace, especially similar to how a human makes purchasing decisions, based on information gathering and retrieval, financial options, and customer satisfaction. It must be remembered that e-personalization systems are not designed to replace brick-and-mortar stores, but to argument them in terms of

customization and customer services. Such e-personalization systems may be sued as additional tools, not a replacement, for CRM-based initiatives. The information gathered should allow for identification of trends and actions and allow for such systems to adapt over time.

CONCLUSION

Firms employing one-to-one marketing techniques via its Web page hope that such efforts will allow e-tailers to specifically each individual consumer. Such e-personalization efforts allows for quick and economical ways of meeting the customer's needs in a very efficient and effective manner with the ultimate goals of ensuring customer satisfaction and repeat visits. Some of the tools include collaborative filtering that uses information from different sites to create a tailored e-commerce experience, as well as user profiling to create a personalized Web page. It is important that appropriate data miming and analysis tools are used to help in the forecasting of future customers' needs and purchasing trends. Unfortunately, although many customers prefer a customized approach to augment their shopping experiences online, much of successful e-personalization experiences depends on the gathering and use of personal user information that have the potential of violating customers' right-to-privacy. Management needs to balance the potential power of ccurrent technologies available to retail buyers involve informative strategies to best make use of the various options available with protecting consumers' privacy rights. Anyone preparing to embark on a retail endeavor of their own will need to be able to glean a better understanding of the implications of the various forms of retail technologies available in order to be successful. As previously discussed, certain aspects of retail technologies require expensive capital investments, and mistakes can be costly, especially in the tight margin environment of retail. Perhaps some of these e-personalization technologies are not practical for small retailers, but it is helpful to understand options as our business grows.

Specific customization tactics, such as personalized permission e-mail, personalized recommendations, and personalized e-commerce stores techniques along with customer service tactics help to build strong relationships with customers, although there was mixed feelings among the respondents of how effective some of these tools are, such as personalized e-mails. It is also important to note, that customer privacy should always be respected by e-tailers to sustain customer trust.

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Chapter 4
Avatar-Based Modeling of Digital Communication in Political Conflicts

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ABSTRACT

Many of the findings within the data have generated more questions than answers; but in doing so, illuminated several paths of further investigation that may provide greater insights into the complexities of stabilizing troubled states. This chapter then, is a starting point on a journey to discover more effective means to deliver humanitarian and development aid to conflicted societies without doing greater harm in the process. Holland discusses the utility of flight simulators in helping commercial airline pilots experience a variety of scenarios that would be unthinkable to expose passengers to in the real world. The value of the pilot's experience in the simulator depends on how closely the simulator matches the aircraft it models. With even greater numbers of lives and resources at stake, utilizing agent-based modeling as a policy simulator would allow leaders to experiment with numerous response and intervention strategies in a very short period of time.

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INTRODUCTION

Pacification, nation building, stability operations, counterinsurgency operations – these are all various names for the activities a victorious military force finds itself undertaking at the cessation of hostilities. This is especially true of the belligerents in a civil war. The international community steps in in an effort to contain the hostilities and deliver humanitarian aid to the refugee population that is inevitably created by the hostilities. Frequently the outcome of a war cannot truly be known for several years after the guns have fallen silent. Does the defeated state rebuild its capacity for governance and join with its former antagonist in peaceful and mutually prosperous relations or does it descend into the Hobbesian hell of a failed nation state; a pariah to the world community? There have been examples of errors made by victors, such as the Treaty of Versailles, that have set the stage for future conflicts that have lessons applicable to humanitarian interventions initiated by the international community.

Troubled nations pose a complex dilemma for policy makers in international organizations. The humanitarian urge to intervene to relieve suffering is strong but it also has a dark side. The delivery of aid to a distressed population in a troubled nation is never neutral: there are always winners and losers. The difficulty in formulating policy lies in the complexity of these types of scenarios. The cause and effect are frequently widely separated in either time or space. Compounding the complexity are the multiple feedback loops surrounding the problem. It is frequently impossible to determine which feedback loop provided the correct linkage between cause and effect until the scenario has played itself out.

The purpose of this study is to identify behavior patterns for the various entities operating among the population where there are varying degrees of stability operations being conducted and utilize these patterns in creation of behavioral models. Agent-based modeling is derived from complexity science. If complexity cannot be readily defined, some of the behavioral elements can be defined. The behavioral elements derived from the literature review are utilized to create the behavioral rules that the agents, or adaptive actors utilize in the simulations. Avatar- Based modeling utilizes five principles that guide development:

1. Simple rules guide agent behavior and can generate complex behaviors;
2. There is no single agent that directs the other agents – there is no agent hierarchy;
3. Each agent has bounded rationality in that each can only respond to local situations in the environment and other agents in close proximity;
4. There is no global rule for agent behavior.

From these principles, agent-based modeling builds a macro social inter- active structure from the interaction of individual units from the bottom-up versus the top-down approach typically taken in typical social science studies (Epstein & Axtell, 1996).

These types of simulations could provide a viable method for assessing risk of various strategic and operational strategies as well as reducing the level of uncertainty associated with counterinsurgency and stability opera- tions. The promise of allowing analysis of patterns of structural emergence and destruction is real and provides an improved adaptive response to the environment (Kiel, 2005). These agent behavioral models are utilized in agent-based modeling simulations to help identify emergent behavioral outcomes of the agents in the population. By varying the level of coordination between the NGOs and the Governmental agents (United Nations Development Pro- gram, USAID, military), different strategies can be identified to increase the effectiveness of those agents and the utilization of resources in the execution of rebuilding a war-torn society. This dissertation uses agent-based modeling to run simulations involving NGO / government coordination policies and their effects during stability / counterinsurgency operations. The goal is to develop a better understanding of whether a high level of coordination between military and NGO activities has a force multiplying effect. Further conditions examined are: Does the level of violence present in the area of operations or the levels of legitimacy for both the indigenous government and/or the insurgency movement, have an impact on the levels of effective- ness – if any – derived from this military-NGO coordination?

Within this study, a generalized and abstract theory of the interaction of the military and civilian NGOs is derived from the views of the participants through the literature on this interaction process. The goal is to maximize the similarities and differences of the information within the emerging categories, and from those differences, revise and present parameter estimates for dealing with the vague, uncertain, confusing, and ambiguous interface between the military and the civilian NGO stratum (Creswell, 2009). The simulation is conducted in conditions described in Roberts (2010) quadrant IV diagram: low domain consensus between agents and a high level of martial threat to all the agents involved. The simulation resource in the landscape for this study is the support of the indigenous population. The following are the agent types and their rules for the simulation. There are be two levels of violence set - low and high – for each set of agent rule parameters.

- International governmental agents whose rules vary with different pol- icy initiatives: high levels of coordination, no coordination, and subjugation of either the civilian or military agencies by the other.

- International governmental, local government and insurgent agent numbers vary (low, medium, and high) for each policy initiative.
- Local governmental agents have three rules regarding the legitimacy interaction with the population: low, medium, and high levels of legitimacy defined by the governmental agents' likelihood to reproduce (recruit additional members from the population).
- Insurgent agents have three rules regarding the legitimacy interaction with the population: low, medium, and high levels of legitimacy de- fined by the insurgent agents' likelihood to reproduce (recruit additional members from the population).

The landscape (local population) initial conditions of being are in one of three states: loyal to the local government, neutral, or loyal to the insurgency. The three states of the population are randomly distributed in roughly equal proportion.

This study focuses on two concepts: the characteristics of the policies available to United Nations agencies in conducting stability and / or counterinsurgency operations and the delivery of development aid and the characteristics of the NGOs engaged in the delivery of development aid in the same operating areas. The categories of case studies of policy that have been examined for this study are:

- Police in the lead with military support or vice versa (Sepp, 2004).
- The timing of development aid delivery vis-à-vis the stage of the counterinsurgency campaign – either early or late (Barlow, 2010).
- The integration of local population into security forces – either high or low (Barton, 2010; Megahan, 2010; Sepp, 2004).
- The level of local population inclusion in development aid delivery – either high or low (Brinkerhoff, 2010; Guttieri, 2010; Pimbo, 2010).
- The level of local institutional development - either high or low (Brinkerhoff, 2010; Pandya, 2010; Sepp, 2004; von Hippel, 2010).
- The level of security from violence – either high or low (Guttieri, 2010; Sepp, 2004).
- The level of local population cooperation with counterinsurgency forc- es vis-à-vis the insurgents - either high or low (Galula, 1964).

The categories for the characteristics of NGOs that have been identified at this point are:

- The level of coordination with government agencies – either high or low (Curry, 2010; Szanyna et al., 2009).
- The propensity to operate independently from other organizations either NGO or governmental – either high or low (de Haan, 2009; Flanigan, 2010).
- The religious affiliation of the NGO – either affiliated.

These characteristics are utilized in building agent-based modeling simulations. Their relative impact in describing the initial conditions of the simulation (to establish the mathematical relationships for programming) is determined and inserted in the agent-based model equations to control the magnitude of the relationship between variables.

The agent-based modeling simulations utilize parameter estimates de- rived in the method described above as a general starting point. The current Afghan counterinsurgency scenario is used to set the initial conditions for the simulation. With this baseline established, additional simulations are run that vary the policy parameters in accordance with the options available to policy makers as described in the previous paragraphs. The outcomes of the simulations are captured with particular emphasis placed upon the interface dynamics between the groups and the effects of those dynamics on the out- comes observed.

The modeling software to be used for the simulations is NetLogo. NetLogo was developed by Uri Wilensky in 1999 at the Center for Connected Learning and Computer-Based Modeling. It is the agent-based modeling software that is used to run the simulations. This software is designed to simulate social phenomena in a programmable modeling environment. The software should be well suited to this research because it allows instructions to be given to hundreds or even thousands of agents which can all operate independently making it possible to explore the linkages between macro-level patterns of emergent behavior and the micro-level behavior of individuals. NetLogo also allows for simulations to be opened and the conditions varied which are critical to exploring agent behavior and scenario outcomes when policy changes are made and introduced. The software also allows for a multitude of graphic representations of the outputs which are extremely useful in presenting the findings of this research (Wilensky, 1999). There have been some fascinating studies on how foreign aid, NGOs, and diplomacy work together (or at odds) in foreign development and national security (Lacquement, 2010).

Flanigan (2010) has conducted a study of how NGOs can frequently be very partisan in strife ridden areas causing them to be problematic for cooperative associations with United Nations agencies. Roberts (2010) has conducted a review of where the current state of affairs has progressed. While providing a framework to understand the depth and breadth of the issues involved, the thrust of her work calls for additional research into the appropriate method- ologies for dealing with "The Civilian-Military Conundrum in the Post-Cold War Era" (Roberts, 2010, p. 213).

While in some cases, these studies have provided a great depth of information on how NGOs function along with their interaction with the populations they are providing assistance. In other cases there have been very broad surveys of why population centric counterinsurgency operations are a critical capability that should be resident within the Department of Defense (DOD). Sara Lischer has been examining

the challenges being faced when integration of NGOs into the planning process in nation building does not take place. Nancy Roberts, a professor of defense analysis at the Naval Post- graduate School in Monterey, has recently published an article lamenting this very issue (Roberts, 2010). Roberts suggest that one of the main issues is the "bleeding boundary" between the military and civilian NGO roles in providing services to distressed populations. From her article, the crux of the issue is the new field manual on COIN that has the military displacing the NGOs in the domain of providing humanitarian relief and thereby causing domain consensus to disappear and friction between the groups to escalate.

The problem unfortunately is not as simple as establishing domain con- sensus. The varieties of NGOs that can be operating in any given area form their own mosaic of goals and intentions. Some of these goals align with those of the interests of the United States – and therefore with the U. S. military – while others may be diametrically opposed. The problem then, for the military commander and other governmental organizations, becomes multi- faceted yet the objective remains singular; the population. Even the basic and critical activity of identifying friend from foe, for all organizations involved, becomes complex and constantly shifting. There is a lack of synergy across disciplines in the study of how to establish where the common goals lie and how they can be effectively integrated (Franke & Guttieri, 2009). Addition- ally, this integration needs to occur without adversely affecting the ability of each of the organizations involved to operate effectively in accomplishing its goals (Mann, 2008; United States Institute of Peace and Peacekeeping, 2009; United States Africa Command 2009 Posture Statement).

BACKGROUND

The international community has become more attuned to the number of complex humanitarian issues developing throughout the world (United Nations General Assembly Resolution 52/167, 1998). This is particularly true in parts of the developing world where civil war or some other driver of civil strife overwhelms the region's capacity for emergency response. When this occurs, the international community feels obligated to act as stated in a series of Guiding Principles contained within the United Nations General Assembly resolution 46/182 (1992):

The magnitude and duration of many emergencies may be beyond the response capacity of many affected countries. International cooperation to address emergency situations and to strengthen the response capacity of affected countries is thus of great importance. … Intergovernmental and non-governmental organizations working impartially and with strictly humanitarian motives should continue to make a significant contribution in supplementing national efforts. … There is a

clear relationship between emergency, rehabilitation and development. In order to ensure a smooth transition from relief to rehabilitation and development, emergency assistance should be provided in ways that will be supportive of recovery and long-term development. (Annex, p. 50)

The study described in this chapter utilizes the recent international coalition efforts to stabilize Afghanistan as the backdrop for the simulation experiment. While there are some very Afghan specific data used to build the landscape for this research simulation, they serve to inform more broadly applicable latent variables that can be found in many "troubled state" scenarios. Several components of background and theory are covered to address the research question with the literature review being the first element.

MAIN FOCUS OF THE CHAPTER

For this study, the statement above is the operationalized definition of stability: the effort to address complex humanitarian emergencies in a way that supplements and rebuilds the receiving nation's capacity to take care of its citizens. This international effort can include, but is not limited to providing security and development aid, assisting with the establishment or reestablisment of the rule of law and governance, as well as humanitarian assistance. Policy makers face a conundrum in failed or failing nation states: how to provide humanitarian relief while weaving the torn fabric of a society back together. Humanitarian action alone is rarely neutral. The advance of humanitarian care and supplies frequently frees belligerents to militarize the refugees and continue the conflict on a wider scale. Other times it takes on a "placebo effect" and nullifies the impetus to provide the military or political engagement necessary to address the cause of the strife (Lischer, 2007). Policy makers that lead with military forces acting as humanitarian workers (such as the Provisional Reconstruction Teams operating in Afghanistan) often find they cannot create the stability they hope for due to inadequate security. Lischer describes the military planners' goal as gaining a "force multiplier effect" from engaging in humanitarian operations.

CONCLUSION

Conflict within a nation state is frequently accompanied by a humanitarian crisis. Internally displaced persons, hunger, disease, and other maladies conspire to tear the fabric of a society apart. While the first instinct of many in the international community is to help, that help can lead to trouble. Human interaction is highly complex yet our capacity to make sense of it all is limited. This state of affairs

frequently causes the world community to stand by and let the upheaval take its course, and only then attempt to pick up the pieces of a broken society if things work out poorly. Even in the best case, the provision of aid has the potential to prolong the conflict. We cannot readily forecast the outcomes of intervention because our tops down models have difficulties dealing with the complex interactions associated with these types of events. Bottom up approaches are not necessarily any better at prediction, but they do have the capacity to provide insights into the interaction of the variables involved in complex humanitarian interventions; much like a flight simulator allows a pilot to try various procedural options when presented with a system failure.

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Chapter 5
Avatars Expand the Opportunities of Modern Economy

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ABSTRACT

There is no doubt that modern economy will change under the influence of digital technologies. This fact stipulates for the analysis of the possibilities of using new technologies in economic practice, as well as the consequences of this process. In this chapter, the authors show how digital technologies contribute to the harmonization of economic interests at the micro and macro levels and maximize the benefits. The purpose of this chapter is to try to assess the advantages and challenges of introducing digital technologies based on avatars using blockchain technology in various areas of the economy. This approach is the theoretical basis for the development of economic solutions for the implementation of public policy on the development of digital economy.

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INTRODUCTION

Modern society has entered a new phase of its development related to the digital era. Most countries are only at the beginning of their journey and only a few of the world's leaders are confidently navigating the "waves of digitalization". The humanity lives in an era of change, when politics, economics, culture, social and public relations are changing dramatically. All these processes lead to a change in the individual's way of life. There is no unambiguous answer what the world will be like in the future. However, today we can already talk about the formation of a new paradigm associated with the increasing role of the virtual world.

The problems of digital economy development are of crucial importance, since the introduction of digital technologies in the reproduction process ensures increase in efficiency and reduction of production costs. This fact stimulates the development of digital platforms and mechanisms that allow accelerating the process of interaction between different subjects and reducing the transaction costs of harmonizing economic interests at the micro- and macro-levels, which will eventually lead to economic growth. The use of various technologies makes it possible to solve this problem. Currently, information and communication technologies include a large number of tools and theoretical groundwork that not only justify the optimal use of a particular architecture of software development, but also provide a great number of users with access to information, high-quality services for planning, analysis and, most importantly, access to the market (i.e. customers, manufacturers, service organizations, etc.).

This chapter attempts to explore the possibilities of developing digital economy based on Triple H Avatar, the software platform for HHH University, Sydney, Australia. The platform, developed at the University, has been able to provide continuous methodological support and advice on all subjects of educational activity (V. Mkrttchian, 2015). The project was completed in 2018 and went beyond the educational process. As a result, a model based on avatars was created, which provided a common platform for solving problems in various areas of the digital economic system. For the first time, this project allowed to scale modelling for a large number of economic avatars and provide graphic user interfaces that can be used at the user level (S. Panasenko, L. Belyanina, I. Potapova, S. Veretekhina, L. Rozhkova, V. Mkrttchian, & S. Vasin, 2019). All these facts allow us to speak about the universality of the platform and the possibility of its application in various areas. This study attempts to address the following issues:

- The use of the avatar platform in various spheres of economy and its expediency;

- The possibilities of harmonization of economic interests on the basis of avatars at micro- and macro-levels;
- The application of avatar-based digital technologies and confidentiality of information.

It can be noted that the lack of understanding and answers to the above questions does not allow us to identify the bottleneck of digital economy and distinguish trends in modern economic development.

Despite the fact that digital economy is a fairly new phenomenon, there is a fairly large reservoir of scientific papers in the scientific community that consider its essential characteristics (A. Strømmen-Bakhtiar, 2019) and its main components (S. Mutula, 2010). The development of digital technologies in commerce (M. Scheepers & D. Kerr, 2018; G. Granata, A. Moretta Tartaglione, & T. Tsiakis, 2019) and the financial sector (A. Rafay, 2019) can be regarded among the fastest growing and most studied issues.

BACKGROUND

Digital economy is a relatively new and important phenomenon. Qualitative shifts in the 1990s are related to the emergence of the Internet, which is still the backbone of digital economy. However, since the 2000s, the development of information and communication technologies (ICTs) has created new prerequisites for changes in the economic system. This process is accompanied by the introduction of digital technologies in an increasing number of devices, the creation of new personal devices (mobile phones, smartphones, tablets, netbooks, laptops, three-dimensional printers), new digital models (cloud computing, digital platforms, digital services), new methods of data analysis and decision-making algorithms, new automation and robotization technologies, the intensive use of big data technology (OECD, 2015). The importance of the ongoing processes has allowed us to raise the issue of creating a new type of economy, where data become the basis for economic analysis, making economic decisions and identifying the patterns of development of modern economic systems.

In its common understanding, digital economy is a digitally-based business in which digital (electronic) data sets will be a key driver of production. In digital economy, the use of the results of such an analysis will significantly increase the efficiency of different types of production, equipment, technologies, sales, etc. Digital economy is a kind of development basis that allows creating new ways of harmonizing economic interests of subjects for the general solution of important

tasks in various sectors of economy, including trade, transport, energy, education, healthcare and many others.

A profound transformation of human society is taking place against the background of the expanding processes of globalization. This stage of development has been made possible due to the impact of development acceleration of scientific and technological progress and revolutionary changes in the field of digital technologies. Revolutionary shifts in development have occurred, first of all, in such spheres as information technologies, robotics, microelectronics, telecommunications. However, the process cannot be limited to them. Digital economy is gradually penetrating into all other spheres of human society and causing changes in the individual's qualitative characteristics. Digital technologies are changing people's lives everywhere, forming virtual and augmented realities embedded in everyday life.

At present, digital economy is not only related to the development of the digital sector and ICT-based activities, but is also part of the total production volume, which is entirely or mainly produced on the basis of digital technologies by firms whose business model is based on digital products or services (R. Bukht &, R. Heeks, 2017). The process of digitalization of economy is carried out in different directions. The following trends are particularly relevant: the creation of digital platforms for providing business services, digital workstations, the Internet of Things, cyber security, digitalization of consumer services, digital infrastructure, robotic systems and artificial intelligence. This approach implies the involvement of all entities at the micro- and macro-level, that realize their economic interests and are aimed at meeting their needs, in digital economy.

MAIN FOCUS OF THE CHAPTER

Development of Digital Economy and Changes in the System of Interests

At present, the development of human society has entered the early stage of the digital industrial revolution, which is characterized by the beginning of transformation of traditional industries on the basis of new digital technologies. The process of digitalization of economy as the basis for the transition to digital economy is conditioned by the requirements of objective reality and is based primarily on the use of digital technologies in its subjects' activities. The expansion of the application of additive technologies, big data (big data processing) transforms the means of production not only in industry, but also in agriculture and services. Advances in robotics and artificial intelligence will contribute to the further promotion of this

transformation and the integration of digital technologies into all phases of social reproduction.

Traditional industrial processes are becoming intellectually interconnected on the basis of digital production technology or digital management methods. In different countries, the promotion of digital technologies varies in speed, which is due to differences in the level of STP development and the quality of human capital. Digital technologies lead to changes in the forms of economic activity organization, complicate the essence of various phenomena, modifying them. Nowadays, thanks to information forms of interaction, a firm can be established anywhere in the world, attracting the necessary resources of any region, which leads to partial replacement of the physical form of reproduction stages.

The development of digital economy changes the process of realizing subjects' economic interests, as subjects' behavior and motives are transformed under the influence of technological factors that make up virtual reality. The result is the formation of a new system of interests and new mechanisms of harmonizing a crowd of interests.

The realization of people's economic interests is the most important link in the mechanism of economic laws. Being between constantly recurring connections and economic activity of subjects, economic interests introduce real forces in these connections, which realize them. In addition, the model of subjects' behavior and economic institutions that determine the functioning of economy are formed in the process of realization of economic interests. Subjects' economic interests, determining their economic activity, are interconnected with the main economic processes and phenomena carried out in the socioeconomic system. These facts allow us to assume that economic interests in the socioeconomic system are the driving force of its development.

The complexity of the system of economic interests testifies to the inconsistency of its development and the presence of problems of harmonization of various economic interests. Thus, contradictions of economic interests can be manifested at the level of relations between individuals, within and between groups, society as a whole. The resolution of contradictions of subjects' economic interests at different levels is carried out by means of various mechanisms leading to the harmonization of economic interests. The basis of harmonization of subjects' economic interests is the interrelation realized through the combination and conjugation of economic interests. The combination is manifested through common features inherent in different types of interests, while conjugation is manifested through the unity of interests that make up the economic relationship. Violations of the interrelationship of various economic interests or the dominant role of a certain type of economic interests lead to their imbalance and, accordingly, to the state of instability of economy and its structures.

The modern development of economy, determined by the introduction of digital technologies, leads to an increase in the role of human creativity, the transformation of property relations and production factors. Digital economy entirely affects every aspect of modern life from healthcare, education, Internet banking to interaction with the state and municipal authorities.

Under the influence of the digitalization of economy, a new system of economic interests is being formed, which is characterized by the following features:

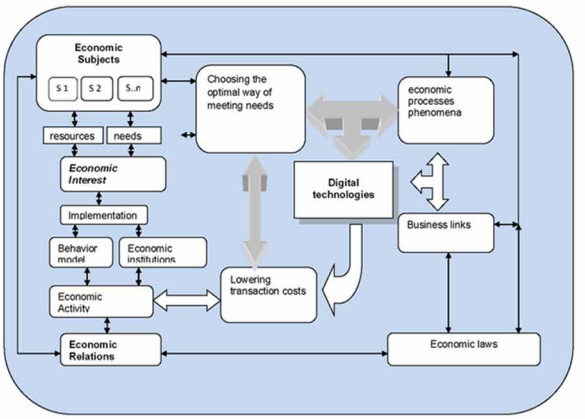
- New technologies provide significant savings of working time, which are necessary for material support of people's lives. It leads to the transformation of the hierarchy of interests on the basis of changing the structure of needs in favor of intangible assets;
- The owner's interest, being the main interest of the socioeconomic system, is connected with the increase of not only material, but also intellectual wealth;
- There is a growing dependence of economic interests on the subject's personal intellectual abilities;
- The most important direction in the development of economic interests is the growth of the need for education, personal development, self-improvement and implementation of creative opportunities;
- There is a transition from interest in maximizing consumption to interest in ensuring a higher quality of life;
- The process of differentiation of interests is accelerating due to the development of the structure of high-tech production.

In general, it can be stated that the evolution of economic interests, determined by the introduction of digital technologies, leads to the transformation of the system of economic interests and the emergence of new mechanisms for their harmonization (Figure 1). In this context, digital technologies act as a link in the system of interests. They allow subjects of economic relations to obtain stable competitive advantages by increasing the efficiency of harmonizing economic interests due to reducing transaction costs, solving the "problem of stowaways" and refusing an intermediary.

In the process of mass transition to electronic document management, communication between business partners, between business and the state is transferred to electronic form (electronic platforms?). Most economic processes are being transformed to become more "digitalized". Two main directions of development of digital economy are being formed, especially in connection with the use of blockchain technology:

1. From business to customer (B2C – Business to Consumer);
2. From business to business (B2B – Business to Business).

Figure 1. Harmonization of economic interests on the basis of digital technologies



The role of the state in this area remains secondary. The state is called upon to ensure the solution of tax issues, protect the rights of buyers and support the creation of infrastructure. The state's activity is manifested in the use of ICTs in such areas of electronic economy as healthcare, education, public utilities. Thus, we have already identified two main subjects of harmonization of economic interests in the formation of digital economy, i.e. the state and business. The third entity that requires harmonization of economic interests in the conditions of digitalization is households. They are buyers of e-services from business and the state, and they also form demand in the Internet of Things, creating a new layer of economic relations called the Internet of People.

Familiar to most people, the Internet is a global network of computers around the world, used mainly for storing, processing and transmitting information. Each year, the amount of information in the network will only increase, surpassing people's ability to assimilate, organize and systematize it. But with the formation of digital economy characterized by the use of the Internet in everyday life at a new qualitative level, such as the Internet of Things, a new level of harmonization of interests – between man and the Internet – is established. In other words, we can speak about a new special form of space organization, including augmented reality. For example, one of the main purposes of the Internet of Things is to improve the quality of people's lives by creating a more comfortable living environment. However, the ways of remote interaction with the help of a smartphone have not yet been adapted to changes in the environment, people's moods, health status, changing the daily routine, etc. Technologies are still far from being able to work for people. If there have been changes in the schedule of the working day, people still have to change

the settings of switching on the air conditioner at home manually. But the vector of development is already clear – it is a transition from the Internet of Things to the Internet of People (IoP), when artificial intelligence will be able not only to take into account the changes and adjust "smart home" systems to changes in the daily routine of a person, but also to play ahead of schedule.

In the near future, the concept of "privacy" will be significantly transformed and the Internet will "know" much more about a person than his/her friends and close relatives. In other words, a bed connected to the Internet will provide feedback on sleep problems and intimate issues, and a toilet bowl connected to the Internet will not only form the need for food for the refrigerator, but also adjust the diet, fill the medication kits with the necessary medicines, adjust the daily routine and give a number of other recommendations necessary for implementation. The main task is to ensure that the Internet of People will contribute to the organization of more effective living space of a person.

Thus, digital economy will change all spheres of human economic activity, the usual stages of technological chains in production, and is bound to break the established mechanisms of harmonization of interests.

The diversity of digital technologies implies the possibility of using various technological platforms to solve the problems of certain economic entities. The authors propose to carry out the process of harmonization of a crowd of economic interests on the basis of avatars using blockchain technology. This approach allows realizing subjects' economic interests while preserving information sensitivity and reducing cyber risks.

SOLUTIONS AND RECOMMENDATIONS

The State and Digital Economy

Modern socioeconomic development of society, marked by the increasing role of technology, is non-linear, ambiguous and exists in a complex interweaving of interests, goals and real prospects. A significant place in the resolution of emerging contradictions in economic development belongs to the state, whose task is to conduct an optimal economic and social policy under the formation of digital economy. The possibilities of forming modern economy that meets the challenges of the XXI century are determined not only by internal factors of self-development, but also by the efforts taken by governmental agencies to form a single technological concept for the development of national economy. In order to develop digital economy, it is necessary to define a concept at the state level, in which the main directions of development concerning citizens, business and the state are formulated. In many

countries, governmental agencies have developed documents that provide the legal framework for building digital economy and reflect the conceptual framework for understanding digital economy(Petrov et al, 2016):

- **China:** "Made in China 2025", "Internet Plus", "National Plan to Stimulate Technological Developments in the Sphere of Artificial Intelligence";
- **Germany:** "Digital Strategy 2025", "Industry 4.0";
- **The USA:** "Strategy of Innovative Development", "National Strategic Plan for Advanced Manufacturing";
- **France:** "Union for Future Industry / New Industrial France";
- **The UK:** "UK Digital Strategy", "Digital Economy Act";
- **Australia:** "National Digital Economy Strategy";
- **Austria:** "Industry 4.0 Austria";
- **Japan:** "Smart Japanese ICT Strategy";
- **The EU:** "Digital Single Market";
- **Sweden**: "Smart Industry – a Strategy for the New Industrialization of Sweden";
- **The Netherlands:** "Smart Industry";

The task of the state in the context of digital economy formation is to create a legal framework, infrastructure in the form of extensive high-speed Internet, and regulation of security issues. In many countries, governmental agencies are creating public digital services for citizens. For example, in "e-government" has been created as a complex of information systems for the provision of public services in electronic form. An example of the effective use of digital technologies is the activities of the tax authorities of Scandinavian countries – Sweden, Finland, Denmark and Norway. In these countries, tax calculation and tax write-off are carried out automatically with further notification to check the calculations (Petrov et al, 2016).

Analyzing the programs of digital economy development in the leading countries in the field of ICT distribution, it is possible to identify common problems that need to be solved: Internet extension, Internet security, digital literacy, innovations. For example, let us consider the development programs of the leading countries in the field of digital economy – the USA and Sweden, which are leaders in digital technologies development (Petrov et al, 2016) (Table 1).

In the context of the formation and development of digital economy there is a transformation of public administration. New tools and mechanisms for implementing state functions are emerging. The basis of such transformation is "e-government". As the world practice shows, e-government contributes to increasing the efficiency of public administration. For example, a review of e-government services in the UK, conducted by an Internet entrepreneur Martha Lane Fox, showed that the

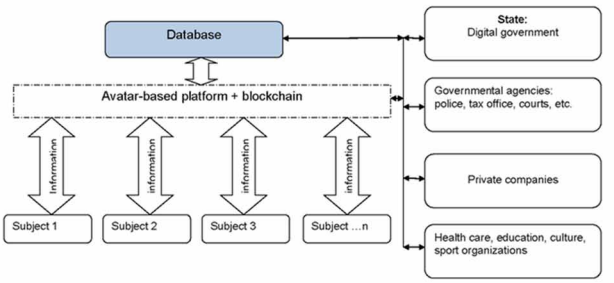
Table 1. Digital economy development programs in the USA and Sweden

The USA "Digital Economy Agenda" (Digital Economy Agenda, 2016), directions	Sweden "Digital Strategy" (For sustainable digital transformation in Sweden – a Digital Strategy, 2017), directions
Free and open Internet with minimal barriers to data flow and various services from abroad	Digital skills: formation of 1. technical skills necessary for using digital tools and services; 2. digital literacy
Trust and security on the Internet: achieving security and privacy of business information	Digital security: the digital security goal entails people, companies and organizations having trust and confidence in the use of digital services and being able to use them easily.
Access and ability: building digital economy infrastructure and access to the Internet for knowledge and skills development	Digital leadership: the digital leadership goal entails activities being improved, developed and enhanced through governance, measurement and follow-up.
Innovation and new technologies: business opportunities for rapid access to innovative projects	Digital innovation: the digital innovation goal entails the existence of competitive conditions for the creation and spread of new or improved products and services of value to society, companies, the environment and people.
	Digital infrastructure: the digital infrastructure goal entails an improvement and reinforcement of infrastructure for electronic communications that are crucial for transmitting data.

digitalization of 30% of the contacts of the "front-office" engaged in the provision of public services will result in gross annual savings of over £1.3 billion, while the digitalization of 50% of contacts can increase these savings to £2.2 billion. The "Digital Efficiency Report", issued by the UK government, shows that digital transactions are 20 times cheaper than telephone transactions, 30 times cheaper than postal transactions and 50 times cheaper than face-to-face transactions. These savings are seen as an opportunity to improve efficiency and reduce the cost of public services in the UK. It may obviate the need to carry out the tasks of reducing budget spending by reducing or limiting the availability of these services to the public (O. Petrov, M. Bunchuk, A. Stott & Y. Hohlov, 2016).

According to experts, digital data will be the basis of public administration. Basic sources will be constituted by legally significant data stored in databases, as well as legally significant electronic transactions and notifications. In this regard, the possession of documents will cease to have legal force, and the authorization of operations will be carried out on the basis of electronic records rather than documents. Such a system provides access to national databases not only for a government body or organization, but also for all interested public and private entities (O. Petrov, M. Bunchuk, A. Stott, & Y. Hohlov, 2016).

Figure 2. Role of the State in the digitalization process



In general, the formation of "a digital government" is the basis for harmonizing the interests of the state and those of other economic entities and requires horizontal integration and interaction between state authorities at various levels of executive power. The methodology of forming a digital government creates prerequisites for solving complex economic tasks, including strategic planning tasks, on the basis of unified digital information platforms. However, the introduction of digital technologies in the public administration system is associated with high risks for national (economic) security. Leveling of these risks is possible on the basis of avatars and the use of end-to-end digital technologies, including blockchain (Figure 2).

Digital Healthcare

Modern healthcare is impossible without new technologies that transform healthcare delivery by providing timely and accessible information that improves operational performance, reduces costs and medical errors, as well as improves patient outcomes. In addition, the introduction of digital technologies is a way to address the acute healthcare inequities that exist in both developed and developing countries. Everything mentioned above is the basis for the emergence and development of digital healthcare, which generally includes all healthcare subjects' interactions in electronic form. Taking into account the scope of new technologies in healthcare, the World Health Organization has introduced the concept of e-health, which means "cost-effective and safe use of ICTs in healthcare, including medical services, medical surveillance, diagnostics, as well as medical and health education and research technologies", which has been a priority since 2005 (Resolution WHA58.33, 2005).

Digital healthcare market can be called a fast-growing one. Global Market Insights estimates that global digital healthcare market amounted to $51.3 billion in 2018 and is expected to amount to 15.4% of CAGR (Health care Information Technology

(IT), 2019) between 2019 and 2025. According to expert estimates, the growth of investments in the development of healthcare infrastructure in developing countries will contribute to the growth of digital healthcare market. For example, between 2000 and 2015, India's healthcare sector received US$3.1 billion in foreign investment.

The most stable statistics on the digital healthcare market are published in the USA. The USA is currently the leader in terms of investment in digital healthcare, and experts believe this will remain the case for a long time to come. According to Rock Health, investment in digital healthcare in the USA is growing steadily: 2016 – $4.58bn, 2017 – $5.78bn, 2018 – $8.1bn. The largest investors in this market were Andreessen Horowitz, Khosla Ventures, New Enterprise Associates, Y Combinator, Novartis, Merck and GV (S. Day & M. Zweig, 2019). According to a survey carried out by the same company, 89% of respondents used at least one digital healthcare tool in 2018, compared to 80% in 2015 (S. Day & M. Zweig, 2018).

In addition to the USA, such countries as China, Israel, India, the UK and Switzerland are also active in the digital healthcare market. In 2018, investors around the world preferred to invest in the research and development of patient solutions, including telemedicine (this segment accounted for 23% of all investments). To a lesser extent, investors were attracted to the field of diagnostics and screening, as well as machine training – these segments accounted for $2.3 billion and $0.9 billion of investments, respectively. Thus, by 2030, global digital healthcare market is expected to amount to $296.1 billion (Health care information technology (IT), 2019). Key players in digital healthcare market include McKesson Corporation, GE Healthcare, Siemens Healthcare, Oracle Corporation, Hewlett Packard, Athena health, All scripts Healthcare Solutions, e Clinical Works, Experian Health, Agfa Healthcare and Care stream Health.

The use of digital healthcare in developed and developing countries differs in some respects due to the socioeconomic differentiation of these countries. For example, in Europe and America, digital technologies are widely used for diagnostics and clinical treatment, while in low-income regions their implementation is limited and has so far been used for data collection, information dissemination and communication between healthcare providers and their consumers. This situation has a mixed influence on creating a positive effect of the digitalization of healthcare.

Healthcare system is also developing along the path of digitalization. The main emphasis is placed on the formation of digital document flow and the creation of a database. Official statistical data allow us to identify the following tools for the digitalization of healthcare singled out on the basis of analyzing the activities of medical institutions: the use of the Internet, e-mail, websites, technologies of electronic data exchange between internal and external information systems, technical means for mobile Internet access provided to employees, RFID-technologies, "Cloud" services (Table 2).

Table 2. Digitalization of healthcare institutions in 2018 (% of the total number of healthcare institutions) (Digital Economy Indicators, 2018)

	2010	2012	2013	2014	2015	2016
Internet	86.8	95.4	96.2	96.4	96.9	97.4
Website	20.7	59.3	69.3	68.3	74.1	80.7
Technologies of electronic data exchange between internal and external information systems	-	30.8	33.7	62.4	71.8	75.2
Technical means for mobile Internet access provided to employees	-	10.8	20.0	25.2	30.7	32.0
RFID-technologies				4.1	4.7	4.9
"Cloud" services			18.0	20.7	29.1	30.9

However, it should be noted that the data presented in the table does not allow for a full assessment of the scope of healthcare digitalization, as it does not reflect the new forms of interaction between healthcare providers and consumers. The following trends in the development of modern healthcare, which are determined by the introduction and development of digital technologies, can be identified:

– Creation of an electronic database – collection and storage of data on patients, medicines, scientific medical data, etc. in electronic form according to uniform rules. The formation of such a database according to a certain criterion includes the collection and storage of information by a certain organization, as well as the possibility of using the information by other interested parties having authorized access to information, which leads to the possibility of subjects' rapid interaction. This direction of implementing healthcare digitalization provides significant acceleration of the interaction process between different structures and organizations;

- **Telemedicine:** Online consultations and medical manipulations imply the following: 1) consultations for patients who are far away; 2) experience exchange between healthcare professionals. Every year, the World Health Organization makes adjustments and develops new systems to support the development of telemedicine worldwide. Among the most successful and progressive international programs are the following:

"Planet Heres" is a program, the main task of which is to exchange data on medicine, statistics and innovative approaches to the treatment of certain diseases.

"Satellife" allows for the exchange of experience and research in the medical field, as well as online consultations involving all participants of the program, thus bringing countries and continents together.

"Hector" is a European program that enables ambulance staff to be consulted quickly and efficiently, thus improving the quality of medical services and reducing fatalities.

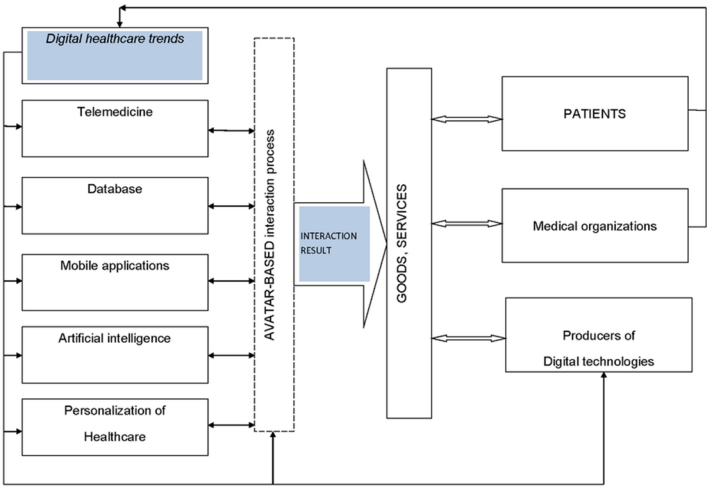
"HOMER-D" is a program that helps to get qualified advice from a doctor without leaving home.

There are more than 180 telemedicine programs in the world that have been successfully operating for decades.

- mHealth development – services and products that use mobile technologies (smartphones and tablets, but also specialized equipment) to simplify, speed up or reduce the cost of medical care and access to medical information. All applications can be divided into several groups: collection and storage of different medical metrics of the user (pulse, blood pressure, heart rate, sleep, etc.); fitness applications (exercise complexes, execution control); applications for healthy lifestyle (dietology, mobile lifestyle, advice, etc.); medication reminders and applications for storage of medical records (e.g. Medical Note); applications for people suffering from a certain disease; applications for interaction with a medical center or clinic.
- Personalization of healthcare based on the development of integrated medicine, which includes the development of personalized treatments, disease predisposition testing, prevention, and the integration of diagnostics with treatment and monitoring. The main principles of this approach are prognosticate, proactivity, prevention, personalization,
- Artificial intelligence uses algorithms and software to approximate human knowledge when analyzing complex medical data. Artificial Intelligence programs have been developed and applied in practice to diagnose processes, develop treatment protocols, develop medicines, and monitor patient condition. The most famous example of the introduction of artificial intelligence in medical diagnostics is the IBM Watson system.

The presented directions of healthcare digitalization are closely related to each other, for example, the process of healthcare personalization cannot be implemented without mHealth and the use of patient database. Therefore, issues related to the processes of harmonized use of digital technologies by different subjects and their economic impact (Figure 3) are on the agenda. However, privacy issues are of particular importance. A solution to this problem can be found in using digital technologies based on avatars and blockchain.

Figure 3. Avatar-based development of digital health care



Digital Education and Labor Market

While education is becoming a driving force of new economy, the requirements to the quality of educational services provided by universities are growing significantly. The modern world has entered the process of constant struggle not for a product, but for the possession of intellect and access to its sources. Digitalization, being integrated into production relations, forms objective preconditions for a new quality of socioeconomic system. This transformation contains both the positive effects of digital economy, such as "the Internet of Things"; implants created using bio printing; unmanned cars, etc., and significant threats. For example, many analysts predict a significant increase in structural unemployment for both developed and developing countries in the near future. Being a consequence of the growing mismatch between the new skills required by digital economy and those provided by the education system at all levels, the increase in structural unemployment will be massive. More people without education or with secondary special education will be redundant, as their functions contain a sufficient number of template functions to be automated, and these specialists are sufficiently highly paid to make automation economically feasible. At the same time, there is an expert opinion that the large-scale nature of the release of labor force will affect highly qualified specialists with higher education due to the obsolescence of many professions or a significant qualitative change in their functions.

Technological changes are already leading to the obsolescence of a number of professions, such as bank teller, stenographer, operator. Analysts predict that by 2020 such intellectual professions as librarians, archivists, travel agents and others will have become obsolete and "left" the labour market. They are to be followed by journalists, legal advisers, notaries, pharmacists, traffic controllers, system administrators and others. In this regard, radical social and economic changes in the structure of the middle class in the direction of reducing its size and increasing social instability are possible in the future.

The complexity of qualitative changes in the labor market and education consists in the fact that digital technologies will continue to change existing jobs and create new ones. In digital economy, the speed of scientific innovation is increasing, simultaneously accelerating the rate of obsolescence of professions and the emergence of new ones, the competence of which is difficult to predict. New professions will appear every 7-10 years. Artificial intelligence will gradually replace routine intellectual work. These processes will take place in two directions:

- Changing the content of labor functions;
- Changing the organization of work itself.

At the current stage of digital economy formation, it is impossible to clearly assess the consequences of this process due to its enormous complexity and versatility. However, in the future, we will be able to better understand what knowledge and skills will be required by new economy. We can now predict the release of low-skilled labour, as these are the jobs that will be primarily automated and replaced by robots.

Daily life includes "unmanned engines" – unmanned cars on the road, in the air (drones), in water; in agriculture and logistics companies, releasing drivers, pilots, sailors, combine operators, etc. The widespread introduction of unmanned vehicles (automobiles, combiners, river transport, etc.) will have a cardinal impact on other sectors of economy. Unmanned transport does not mean just the absence of man driving a car, it is the introduction of artificial intelligence, almost the Internet of People in action. Unmanned transport will allow to automate a considerable part of a person's physical activity, not connected with routine work. In the near future (almost in 5-7 years) man will be required to have knowledge, skills and abilities of a completely different quality. And in these conditions people need to realize their new position and adapt to the change of their status and learn to "cooperate" with artificial intelligence. In the United States alone, according to the estimates by the White House Council of Economic Advisors, the introduction of unmanned cars in the country will affect from 2.2 to 3.1 million jobs (Artificial Intelligence, Automation, and the Economy, 2016).

In digital economy, flexible forms of employment will be formed, including fully remote types of work. "Inflation" of qualifications and fundamentally new professional competences of a person significantly increase the role of the education system in ensuring the transition of society to a new level of socioeconomic development – digital economy. By the beginning of the twenty-first century, the bulk of the world's human capital was concentrated in highly developed countries (such as the United States, United Kingdom, Germany and Canada). This has allowed these countries to have a significant advantage in technological and intellectual development, in shaping the standard of living and quality of life of the population and, consequently, in attracting highly qualified specialists. These countries make most of their investments in human capital. There are three main levels of digital economy formation in these countries. These levels are closely interlinked and have a significant impact on the standard of living and quality of life of both the individual and society as a whole. In the context of increasing globalization, digitalization in other countries is likely to follow a similar pattern. Therefore, it is necessary to pay attention to these directions.

Firstly, these are markets and economy sectors (spheres of activity), where interaction of specific subjects (suppliers and consumers of goods, works and services) is carried out; secondly, platforms and technologies, where competences for the development of markets and economy sectors (spheres of activity) are formed; and thirdly, the environment which creates conditions for the development of platforms and technologies and effective interaction of subjects of markets and economy sectors (spheres of activity), and covers the regulatory framework, information infrastructure, personnel and information security.

Effective development of markets and industries (spheres of activity) in digital economy is possible only in the presence of developed platforms, technologies, institutional and infrastructural environments. The sphere of education is one of the crucial and most promising platforms for global competition of states for economic power and political influence in the XXI century. Two parallel processes are going on: along with the process of obsolescence of some professions there is a process of formation of new ones. For example, in the Russia, the number of citizens who recognize the need for digital competences is increasing, but there is a serious gap in digital skills between different population groups within the country. Moreover, the level of using personal computers and the Internet is still significantly lower in Russia than in Europe.

The world is on the verge of forming a new way of life in which socioeconomic development is proceeding not in an evolutionary, but in a revolutionary way. Currently, there is a situation where such countries as Singapore, Malaysia, China, Indonesia, etc. confirm with their experience the possibility of achieving high results

in a short period of time (from three to six years), the achievement of which could be predicted earlier only in fifty to sixty years.

The competitiveness of the state in the coming years will depend on the quality of human capital and its adaptation to digital economy. And here digital education comes to the fore as a mechanism for transforming human capital and tuning it (as a musical instrument) to competences which are able to meet the ever-changing demands of the labor market. But now the labor market is unable to answer one of the main questions: what professional competences will be in demand in the near future. The introduction of new processions every 5-7 years makes it much more difficult to train teachers who will have to teach these new professions. Everything is changing very quickly. Therefore, the concept of "LLL" (life-long-learning) has become widespread. It is based not only on life-long learning, but also on the individualization of the educational sphere at the expense of advanced-learning-technologies. Education is gradually "leaving" for the virtual reality, forming a hybrid world and completely changing the worldview of man. The digital revolution has embraced all spheres of human life, dramatically increasing the speed of innovation, which brings the problem of digital illiteracy to the forefront of the educational sphere.

According to polls, the majority of the population does not have full understanding of what the digital economy is. For example, cloud computing is a technology of distributed data processing, i.e. in a browser, when software resources are provided to the user in the form of a remote server. In this regard, many ordinary people misinterpret digital economy as a set of technologies (blockchain, 3D-printing, cloud computing, etc.). It is far from being so. Technologies, along with industries, institutions and directions of development, create a matrix, being an integral part of digital economy.

Unfortunately, as a result of advertising, information disseminated through mass media, social networks, and telecommunications, the population has the wrong opinion that new technologies will be able to solve all problems in the near future. However, new technologies, along with progressive development, carry serious risks and threats. New technologies are a tool one should learn to use. And these skills are directly related to digital literacy, human resources, the quality of human capital, and how quickly, first of all, the higher school will master digital economy and transfer knowledge and professional competences to production, the service sector and citizens' everyday life.

The main requirements of digital economy for educational capital are as follows:

- Personalization of education;
- Formation of a new way of thinking;
- Quickness and quality.

Modern economy is in dire need for workforce adapted to the ever-changing demands of the labor market. Since 2016, Russia has been implementing the federal project (Table 3).

But that is not enough for now. The cultural code of modern humanity is changing. It is necessary to form and develop information culture, digital culture, as a set of codes that prescribe certain behavior in a particular situation. Communication on social networks, communication on educational portals with remote access, etc., moral censorship when posting photos, videos, and various comments have to be learned and mastered. By everyone. The place and role of a teacher in modern society is being transformed. And this process has both positive and negative sides. On the one hand, the availability of information is expanding, the form of knowledge transfer from the teacher to the pupil is changing, and various virtual simulators are appearing to develop relevant skills. However, a centuries-old tradition of methodical and methodological foundations for education and upbringing of the younger generation is being lost. The level of interpersonal communication as living communication is decreasing. It is much easier for young people to communicate through gadgets. The process of integrating a person into the social system is becoming more complicated. But the social environment itself, its social norms, rules and values are changing. We are on the verge of forming a new social reality – a digital social environment, the so-called hybrid world, where our everyday life is organically connected to the virtual and augmented realities and is perceived by man as a whole unity. The network becomes a new environment for human habitation, a reality for each individual and society as a whole, it forms network consciousness and network identity. If earlier the formation of personal identity was influenced mainly by one's culture, language,

Table 3. Number of personal computers used for educational purposes per 100 students in educational institutions of the Russia at the end of 2016 (Digital Economy Indicators, 2018)

	PCs used for educational purposes		
	total	**as part of local area networks**	**with Internet access**
Educational organizations carrying out educational activities under the educational programs of primary, general, general basic and general secondary education	12,9	6,9	9,2
Educational organizations carrying out educational activities under the educational programs of secondary vocational education	16,7	12,8	13,4
Higher education institutions	23,8	21,4	21,5

place of residence, ethnic group, in the modern digital world in the conditions of globalization, in contrast, one's identification deviates from belonging to different social, economic, national, professional, linguistic, political, religious, racial and other groups or other communities. And in this regard, the management of the formation of a person's identity becomes one of the key tasks of education.

It is clear that children are most likely to be the quickest to adapt to such a digital social environment when the formation of appropriate digital competences takes place at the level of play interaction with people of the same age as well as with elder ones. But due to the complexity and constant change of digital technologies, digital competences will be formed throughout a person's life. Therefore, one needs certain skills not to get lost in the flow of digital information. It concerns educators as well, who need willingness to learn every day and the ability to quickly integrate constantly updated courses into new technologies. Along with digital competences aimed at developing knowledge, skills and abilities to use information and communication technologies (ICT) confidently and effectively for work, leisure and communication, it is necessary to develop soft skills – the ability to build intercultural network communication (social and professional) in the digital world.

Moreover, it is necessary to carry out qualitative analysis of the activities of enterprises in various sectors of economy in order to identify specific examples of the use of digital technologies and their economic efficiency, to identify the need for certain modern competences in the labor market.

In digital economy, almost everyone has the same starting point: some people (the older generation) have outdated skills, while others (the younger generation) have underdeveloped professional skills. We all start with the basics and must be able to generate new knowledge by ourselves.

Therefore, among all professions in digital economy, a special role is played by educators with digital competences. They are the ones who will be responsible for the entire process of building a digital society. In this regard, it is necessary to establish Teacher Training Centers everywhere to provide educators with digital competencies at the basic level according to the standard common for all countries. Then we will be able to speak about a certain point of reference for the formation of a new society, a digital one.

Life-long learning will be the basis for the entire system of education. Life-long learning will be based on digital technologies such as blockchain. Blockchains are characterized by the following features: lack of a common server, possibility of storing information on different data media, decentralization of data, and guaranteed information security. And here there are a number of advantages, firstly, the transparency of the learning process, when the transition to a new educational level is possible only when the previous one is fully completed. Blockchain technology can be successfully used as a mechanism for objective assessment of human qualifications

and individual skills (competences). The results of such assessment will be used by employers as a digital resume for employment, and can also be used by citizens themselves to build their educational trajectories.

Second, blockchain technology is constantly being updated. New information blocks are attached to existing chains. Data is sorted automatically by marking the time and date of the creation of a particular entry in the registry. Also, the binding to other thematic blocks (with reference to the whole chain) is specified. Blockchain technology blocks manipulation of diplomas and scientific papers (articles, dissertations, monographs).

Third, blockchain will allow you to track changes and their authors. For scientists and researchers it is a great opportunity to preserve and protect their scientific discoveries, as well as to expand access to research by other scientists, including narrow specialization.

The ubiquitous use of the LLL concept will lead to the formation of an end-to-end line of the creation and maintenance of updated digital competences, starting with preschool education, through general and higher education up to supplementary adult education. All this is also possible through the use of blockchain technology.

Supplementary adult education is one of the main ways to maximize the comfort and efficiency of an adult's entry into the new elements of the digital world; to maintain their competitiveness in the labor market; to meet the social and psychological needs of the individual in terms of spiritual development, to be appreciated by the society, and to be aware of one's significance. In the end, all this leads to the improvement of the level and quality of life, being the main task of the human society's development.

The basic factors of socioeconomic development today are information and knowledge. Digital technologies are not just an instrument of development, they form a habitat, opening up new opportunities for education:

- Mobile digital (electronic) school: learning in any convenient place and at any convenient time;
- Life-long learning;
- The possibility of designing an individual educational program at the request of the client (the employee or the employer);
- Adaptive education;
- Development of digital libraries;
- Urbanization of education;
- Digital educational marketing.

In the context of transition to digital education, there is a growing tendency for students to work independently, and new approaches to developing responsibility and teamwork are emerging. The content and methods of education are being

transformed. There is a process of converting educational technologies into the electronic environment, where instead of traditional lectures involving presentations on multimedia devices, students listen to online or recorded video lectures; instead of traditional textbooks published by a printing house, students use electronic textbooks; and workshops and seminars are transformed into webinars. In this case, the coverage of the student audience is expanding significantly: the number of students is not limited to the number of seats in the lecture room or the number of students in the group. The number of students in such classes is limited to the registration on this educational platform.

New methodical approaches to digital education, such as p2p assessment, are being formed. In assessing each other, students learn to feel additional responsibility for learning, for teamwork. The BYOD (bring your own device) practice – the use of one's own gadgets and other technical means for educational purposes – is being expanded. In 2014, about 40% of U.S. higher education institutions adopted a BYOD approach. [University Business, 2015]. Many educational institutions use a hybrid approach using special Illuminate platforms to integrate third-party cloud solutions and classic enterprise-systems (ERP, CRM, etc.). The role of video content – webinars, on-demand video, etc. – is growing, which was facilitated by the introduction of the "inverted class" model. The founders of this educational technology are American teachers Jonathan Bergman and Aaron Sams. In 2007, they invented how to provide lectures to athletes who often missed classes, and then developed this idea into a new educational direction.

Quality requirements for digital materials used in digital education have increased significantly in recent years. In the U.S. lection capture platforms such as Kaltura, Panopto, and Warpwire compete in this market.

Currently, the system of education in many countries is on the way to digital society. The transformation of the system of education into a digital one is in full swing. The effectiveness of this transition depends on many factors. But the main challenges for the transformation of the system of education into a digital one are special educators with digital competences in addition to professional subject matter competences, and digital infrastructure.

But it is not that simple. In this case, methodological approaches to learning and knowledge testing are changing significantly. A teacher needs new competences and new methodical skills to work in the electronic educational system. Knowledge of information technologies and even the basic models of their application is not enough for effective work of the teacher in the XXI century. Such competences as critical thinking, initiative, creativity, adaptability, innovation, and emotional intelligence are needed. In online education, the importance of the teacher as a knowledge-bearer, expert, tutor increases significantly. Those who want to take online training choose a teacher speaker, not an online platform. The best EdTech teachers become brands.

Users of educational services choose a teacher, not a university, where they would like to get an education.

E-education techniques can be found at almost all educational institutions in many countries. These are electronic diaries, registers, electronic credit cards, electronic registration for lecture courses, seminars, etc. Digital recording of student activities provides an opportunity for objective assessment of the effectiveness and efficiency of his or her education.

The data on the educational and professional activities of a person, accumulated in the digital environment, form his or her digital portfolio or individual digital career history.

Currently, in many countries, higher education is provided to 70 to 90 per cent of the age cohort of the population: 82 per cent of the age cohort in the United States, 91 per cent in Greece, 94 per cent in Finland, and 96 per cent in South Korea. The total number of students in China and India studying at universities both at home and abroad exceeds the number of students from all European countries combined, including foreign students from European universities, and is about 50 million people. In the Russian Federation, approximately 5 million people are currently enrolled in higher education.

The transfer of educational standards to the process of mastering competencies by students, which is based on the system-activity approach, which forms the student's ability to act independently, to search for information on one's own, to set and solve educational problems, has almost completely reoriented education and predetermined a renunciation of the "knowledge" paradigm aimed at the formation of knowledge, skills and abilities. This provision was a necessary condition for the modernization of higher school and its integration into the world educational space. We share the view that competence is an integrated combination of knowledge, skills and abilities; the unity of theoretical knowledge and practical activities. In this regard, competence is a combination of two components: cognition and activity. The cognitive component includes knowledge, skills and abilities, the developing of which the traditional approach to learning was aimed at. In our opinion, the competence approach is a derivative of the traditional one, but here the "activity nature of knowledge", i.e. the ability to apply it in practice comes first.

It should be noted that a number of Western countries have different approaches to the system of education, including higher education, depending on its goals. There is a practice of providing the so-called "elitist education", i.e. education for particular privileged groups of population depending on one's origin or position in the hierarchy of the ruling class. Barriers to access to elitist education, which provides a wide range of knowledge, are extremely high. This situation significantly reduces most people's ability to make informed choices and decisions by widening the asymmetry of information and knowledge.

The experience of foreign countries should be also taken into account, for example, in the United States' universities the practice of co-financing education through the activities of boards of trustees, business executives and wealthy individuals (patronage institute) is widespread. Objective processes, such as demographic decline and structural changes in the country's economy, have also caused transformations in the system of higher education.

To be competitive in knowledge economy, Russia needs to increase the share of highly qualified people on the labor market. According to forecasts, by 2025, the domestic labor market will probably have faced a significant shortage of highly qualified personnel (more than 10 million people): these are doctors, engineers, analysts, managers and a number of other specialists. The problem is not the absence of such specialists in general, but a significant gap between their skills and abilities, formed at universities, and the real demands of the labour market. And it is not just the digitalization of institutions of higher education with the transition to distance education, online learning and the use of the electronic educational environment that is important here. Here a proactive modernization approach with qualitative changes in the labour market is required.

FUTURE RESEARCH DIRECTIONS

In general, digital economy will contribute to the growth of labour productivity, reduction of transport costs, costs of storage, safety and optimization of the number of labour resources. Small business will be the main economic actor in digital economy in the majority of developed countries. The Internet economy is usually focused on small companies in such countries as Canada, the United Kingdom and France. Digital economy is dominated by financial institutions, which must have the ability to pay for advanced ICTs. Sometimes it is these institutions that drive the Internet economy, creating separate branches of digital banking, insurance and other industries.

The development of electronic economy expands the possibility of communication, exchange of experience and ideas. Communication on the Internet allows uniting people to create a business; search for employees or colleagues, resources and markets. The development of Internet technologies in the public sphere is of great importance. E-government and public service delivery are seen as a way to reduce costs and corruption as well as provide citizens and business people with efficient services. However, the phenomenon of digital economy is quite new and all the challenges, threats, risks and benefits of transforming the economy of a modern state towards digitalization have yet to be assessed.

As a result, it is necessary to do the utmost at all levels of education to teach today's students how to operate quickly, and it is better to start not from university, but from school. The present requires the ability to perform tasks not only quickly, but also qualitatively. Therefore, it is necessary to further develop and improve the quality management system (QMS), implement the process-and-project approach and compare the results obtained through a software product. In general, the modern trend in economic development is velocity!

CONCLUSION

Man is a key element of digital economy and the process of transition to it. And it is important to understand that the formation of new competences adequate to digital economy should not overshadow the human personality. The creator of future digital economy is a mathematician, programmer, specialist in cognitive research, teacher, organizer and manager, entrepreneur and investor – a person with digital competences, equipped with digital technologies and applying them in everyday and professional activities. This is a person who daily comes into contact with artificial intelligence, with robots. He has a different mentality, a different culture, and different values. They have not been formed and even formulated yet.

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Chapter 6
Blockchain Technology Is Changing the Innovation Aspect in the Digital Economy

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ABSTRACT

In the digital era, banks are moving from their traditional methods of innovation to high-tech technologies. They have been working hard to provide a secure platform to their customers. With their continuous efforts and hard work, the concept of Blockchain technology came into notice. Blockchain technology is popularly known for Bitcoins. Nearly every third person or organization either knows about blockchain technology or uses it. Blockchain technology can address most of the issues related to Digital Transactions, Double Spending, and Currency Reproduction. The chapter will discuss the basic concept of Blockchain, its history, how its networks and technology work, and how its primary technologies evolved. By the end of the chapter, the technical design and expected outcomes will be clearly understood. The chapter also tries to review other research done in this domain.

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INTRODUCTION

Blockchain is the most popular technology these days. All big organizations are working with blockchain. Blockchain is a chain of block that contains information. This technique was described in 1991 by the group of researchers and its purpose at that time was to digitally timestamp the documents in order to avoid backdating of the document or to make any kind of alteration in them. Till then this technology was unused until it was adopted by Satoshi Nakamoto in 2009 to create Bitcoin (a digital crypto currency). It a distributed ledger that is open to anyone. The property of this blockchain is that once a data is recorded in them it becomes extremely difficult to make changes in the block. (Steen, 2007)

Blockchain has brought up opportunities for various industries and banking sector is one of them. It is believed that the technology will bring lot of changes in the services of banking sector. International trade will move one step ahead. Checking the internal and external transactions will become easier. It is the best method to avoid frauds, money laundering and to insure commitments. In the coming years Blockchain will exponentially spread with in the banking system. So the industry is exploring the exponential use cases of Blockchain. Blockchain is just not about Bitcoin but there lies much more of it which is yet to be discovered.(Drescher)

In Germany the banks are looking forward to use IBM's Blockchain. The ongoing project of IBM is to build Blockchain that can be used by several European banks. Reports say the Blockchain that has been the building component of Bitcoin will become the base for global financial system. World Economic Forum released a report that 4 out of 5 banks are going to use the Blockchain technology by next year. This year Indian also discussed about using Blockchain technology in the banking sector during the budget announcements.

To ensure the safety and security the banks will running some pilot projects. Though the technology has caught the attention of many banks, people also have to look for all possibilities. More than 25 banks see the potential in this technology. Blockchain records transaction and keep the data secure. (Steenis, 2016) The purpose of this paper is to provide insight of Blockchain and its applicability.

The paper classifies the role of this technology in various fields. The paper is structured in section where Section II reflects the overview of Blockchain technology, whereas Section III is the detailed description of practical implementation of Blockchain. The paper reflects some of the technical design, expected outcomes in Section IV whereas Section V will contain the remarks and conclusions.

FUNDAMENTALS OF BLOCKCHAIN TECHNOLOGY

A Blockchain is a data structure or a decentralized ledger used for keeping records of transaction or any event. It records all the transactions across peer to peer network. Blockchain is a chain of block that contains information. As we all know that it's a distributed system it confirms the transaction without the central authorities (Steen, 2007). He is shows that the system is connected to a single node which clearly reflects that this is a centralized network system. Drawback such system is that if central system shuts then every other node gets disconnected. Image b reflects decentralized network where there is interconnection between the nodes. Each single node is connected to another node.

Key benefits of the technology is that it increases transparency, security is increases, unchangeable records, transaction time is fast and as there is no third party involved it also reduces cost. But there are some aspects that can be hindrance in the adoption of this technology. There are the technology is complex to understand, it can increase anonymity that means who is performing what transaction is unknown and there are lots of challenges faced in implementation of this technology. All these points are also some of the reasons which are hindering the banking sector from implementing this technology.

The potential applications that are using this technology are Cryptocurrency, Healthcare and voting system. Cryptocurrency is better known by Bitcoin but cryptocurrency is just not limited to bitcoins it is far more beyond that. Bitcoin is just an example in cryptocurrency encryption is used to control the creation of digital currency. (Nakamoto, 2008) It is also used to verify the transaction like transfer of funds etc. Healthcare system a patient's report can be share with multiple specialists in order to get the views and appropriate treatment for the patient keeping in mind the risk of privacy breaches. Voting system blockchain can also be used to cast votes using a smartphone or any other electronic media resulting in immediate response and tabulation of the result would be very quick.(Devetsikiotis, 2016).

The size of the blockchain is not restricted as it increases with the addition of every new block. Whenever a new block is added to the previous block the linking is done through hashing or hash function. Devetsikiotis is explain the basic concept of Hashing

To a hash a cryptographic function is used (Hash function). A hash can be compared to a fingerprint or a unique id that provides security to or block. Devetsikiotis show the block are hashed just it is in the case of linked list but in that case it contain the reference of the next data and in case of block the header contains the previous block. As Block N its header contain the hash of the previous block and then there occurs a transaction then when new block N+1 is generated its header section contain the

hash of block N and the transaction and this process will go on whenever a new block will be added.(Bayu Adhi Tama, Palembang, Indonesia).

A single block contains three sections. 1. Data 2. Hash and 3. The hash of the previous block. The data stored inside the block depend up the type of Blockchain. Let's take Bitcoin Blockchain as an example which stores the details about a transaction such as the sender, receiver and the amount of coins involved in the transaction. The next component of the block is hash. We can compare this hash to a fingerprint. As the fingerprint is unique for each individual this hash is also unique identity for the block no two blocks can have same hash. The main task of a hash is it identifies a block and all of its contents and it is always unique just as our fingerprint. As soon as the block is created its hash is calculated so if any changes made inside the block will cause hash to change. So if changes to the block are needed to be detected hash are more useful then. It means if the hash changes it is no longer the same block. The third element in the block is the hash of the previous block which results in the creation of a chain of blocks.(Drescher).This entire process can considered to be based on circular linked list concept.

The first block of the block is known as Genesis block. It will have no previous hash as it's the first block to the chain and it is not the continuity to any block. As in Figure 4 blocks 2 and 3 has both hash and previous hash we can relate it to the double linked list in which we have the address of previous as well as the next node. So if anyone tries to make changes in block 2 it will cause changes in the hash of 2nd block in turn making block 3 and the other entire fallowing block invalid as they no longer store the valid hash of the previous block. But the security totally doesn't depend upon hashing with the advancement of the technology changing the hash won't be impossible. (Bayu Adhi Tama, Palembang, Indonesia) In order to mitigate this blockchain has a solution called Proof –Of–Work. It is the process that slows the creation of new block. So hash, Proof –Of–Work and distributed system makes the blockchain secure. (Kshetri, 2017)

BLOCKCHAIN APPLICATIONS

Blockchain technology is able to address most of the issues related to Digital Transactions, Double Spending, and Currency Reproduction. All these mentioned issues have been taken care of by Blockchain concept. In case of the banking sector, banks have reached more and more customers by providing them the digital transaction option but in order to make the customer feel more secure, they are trying to make these platforms safer. The services are just not restricted to transactions, but they are the best way of record keeping. It also helps in removing data centralization and thus it is efficient enough to protect sensitive data.

Though the banks have not fully adopted the Blockchain concept as they think putting the crucial detail on the block won't be the smartest idea, there are some banks who have tried running some pilot project in order to accept the technology. Though the banking industry is still looking ways to work with this technology but there are other industries that have started implementing blockchain technologies in their respective areas. Pie chart in Figure 5 shows the use of blockchain in other fields. All the applications are categorized in groups. This technology is expected to be the revolution in all aspects.

1. Healthcare

Blockchain technology has come up with n number of solutions for the issues faced in current healthcare system. Stakeholders and researchers can share the electronic health records so as to find the solution to the diseases. This not only improves health sector but it also provides information about other diseases. To maintain the security and privacy of the patient a Healthcare Data Gateway storage platform is created based on blockchain technique.(X. Yue, 2016)

2. Financial Services

The initial implementation of the blockchain technology was on financial services. It was applied to keep track of financial transactions also known as cryptocurrency. Cryptocurrency is better known by Bitcoin but cryptocurrency is just not limited to bitcoins it is far more beyond that. Bitcoin is just an example in cryptocurrency encryption is used to control the creation of digital currency. It is also used to verify the transaction like transfer of funds etc. (U. Mukhopadhyay, 2016.

3. Business and Industry

Internet of Thing has brought a lot of advancement in the business industry. This lead too many researches in developing e-business architecture that kept IoT as its base. Intervention of blockchain in the business sector has cut all other extra costs like the transaction cost has almost come to zero and the cost of communication between the sender and receiver has also been reduced. Not only has this it had improved productivity, audit ability and traceability. Blockchain has brought up opportunities for various industries and banking sector is one of them.(Wen, 2015).

IMPACT OF BLOCKCHAIN IN BANKING (INDUSTRY)

Although blockchain is around from last ten years but still not introduced in banking sector. At this point in many ways it can influence banking sector. A few among them are discussed below:

Decline in Scam

Using blockchain in banking industry we can reduce fraud. Generally, in banking we use centralized databases and anytime hackers can make cyber-attacks on database for this they(hackers) just required to access the system and branch it. If it takes place, scam is eminent if the observation of division is not on time. Hence, such type of fraud can be mitigate using blockchain technology. This will happen because in this system each transaction will have assigned a timestamp. (Karim Sultan, 2018)

Create Smart Agreement

Apart from decreasing transaction cost blockchain technology can store the huge digital information which can help to create a smart agreement in transaction via inserting the unique keys through parties involved. (Devetsikiotis, 2016)

SOME REMARKS

The expected outcome of the technology is that it establishes digital identity, eliminates man in the middle and works as a record keeper not as database as in case of database changes in the records can be done by the administrator but in blockchain no changes can be made. Not only this it also records both kinds of data static as well as dynamic. It serves as a platform like for the smart contracts etc. There are approximately 26 research papers that speak much of blockchain applications. In order to search for the papers keywords like Bitcoin, Banking sector and Blockchain was used. This technology has brought up new trend and caught up everyone's eyes. Immense research work is done in this domain and all the possibilities related to the banking sector are considered so that this technology could be implemented in this area. (H. Kalodner, 2015)

Almost every third person or organization is either knows about it or using it. Blockchain technology is able to address most of the issues related to Digital Transactions, Double Spending and Currency Reproduction. All these mentioned issues have been taken care by Blockchain concept.(Owen, 2015) In case of banking sector they have reached more and more customers by providing them the digital

transaction option but in order to make the customer feel more secure they are trying to make these platforms safer. The services are just not restricted to transactions but they are the best way of record keeping. It also helps in removing data centralization and thus it is efficient enough to protect sensitive data.

CONCLUSION

The technology has its advantages over others such as the no hampering with the data. Data once fed into the system cannot be reversed or changed. It acts as both the database as well as the network which makes it secure and it is integrated across all the platforms. If we consider the transaction it is defined through some rules that are further structured mathematically which are then enforced mechanically. We can consider the blockchain as layer of transactions which holds numerous records. (Inaba, 2016)

Blockchain has brought up opportunities for various industries and banking sector is one of them. It is believed that the technology will bring lot of changes in the services of banking sector. International trade will move one step ahead. Checking the internal and external transactions will become easier. It is the best method to avoid frauds, money laundering and to insure commitments. In the coming years Blockchain will exponentially spread with in the banking system. So the industry is exploring the exponential use cases of Blockchain. Blockchain is just not about Bitcoin but there lies much more of it which is yet to be discovered.(A. Dorri, 2017)

Key benefits of the technology is that it increases transparency, security is increases, unchangeable records, transaction time is fast and as there is no third party involved it also reduces cost thus resulting in reduction of charges. But there are some aspects that can be hindrance in the adoption of this technology. The technology is complex to understand. It can increase anonymity that means who is performing what transaction is unknown and there are lots of challenges faced in implementation of this technology. All these points are also some of the reasons which are hindering the banking sector from implementing this technology.

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Chapter 7
Cross-Cluster Projects in Development of Innovations and New Industries

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ABSTRACT

In modern conditions, innovations appear not so much as a result of successive linear processes, but as a result of cross-functional interactions between different industries. Modern innovative projects are the results of cross-cultural, cross-information, cross-disciplinary collaborations. Their results are not only the development of perspective projects, but also the emergence of new industries in the economy. In the Chapter, the model of implementation of cross-innovative projects in the cluster as an EFFECTIVE modern production system is considered. Prerequisites are investigated and the model of realization of cross-cluster projects is offered. Considered are examples of successful implementation of collaborative projects within the clusters of countries in Western Europe and the USA. The perspective directions of cross-cluster projects for the development of the economy of Russian regions are determined. Dedicated perspective purposes for the management companies of clusters to promote cross-cluster innovation.

INTRODUCTION

Computerization of education is an important means to implement the new educational paradigm, in which the leading role is played by information and continuous development of advanced nature of learning. The introduction of

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information technology in the learning process leads to drastic changes informational and educational environment, making it more open, transforming the individual educational centers into a single educational space. Knowledge society makes new demands on professional skills of civil servants, continuous updating of memories. Development of information science and technology determines the need for a strategy of development of additional vocational training of civil servants by means of electronic educational systems.

We have found that the preparation of highly qualified public servants able to perform their professional duties to provide public services, especially in electronic government (E-Government), at the moment, is a problem of particular relevance. In this case, a prerequisite for increasing the efficiency of public administration is the competence and professionalism of the state administrative apparatus, achieved through continuous development of creative, personal and professional capacity of civil servants in accordance with the relevant tasks of the state. And the use of E-Learning technologies in vocational retraining and advanced training of civil servants, placing increased demands on their intellectual capacity and skills to work with information resources. For E-Learning to the fore independent work, supports asynchronous work and consultations with a particular teacher.

However, in today's global information society of mass communication, the question of the qualifications of civil servants in the field of Information Science and Technology (IS & T) remains open, because their level of competence in IS & T does not fully meet the requirements of society to a specialist in the field of . The process of using technology E-Learning in vocational retraining and advanced training of civil servants is complicated by the current low level of knowledge of skills of employees with information resources, their lack of motivation to work independently, as well as undeveloped study of pedagogical, organizational, economic and technological conditions for effective solution to this problem. It is necessary to create a single information resource, including basic bank additional professional programs for civil servants and bank methodical, analytical and informational materials on the most pressing issues of implementation of the state policy for self-civil servants. Deployment of mass training of civil servants is possible within the network of educational-informational environment - Network University uniting on a contractual basis resource of many educational institutions all forms of ownership (Mkrttchian, 2011-2015).

BACKGROUND

Exploring the development of pedagogical concepts of distance learning, you can organize all their diversity in the following models: industrial (traditional), cognitivist - behaviorism, constructivism and connectionism.

The result of the process of modernization of the industrial forms of education is the development of remote training, contributing to the emergence of the concept of behaviorism and cognitivist, based on the study of human behavior, which are beginning to blur the class-lesson unified technology of mass education.

In cognitive-behavioral tradition of learning is based on the behavior and / or changes in the behavior of the individual, resulting from reflection. This approach is based on the centralization of interest to the individual student, his behavior (Wedemeyer, 1971).

Active development of information technology becomes the starting point for new pedagogical concepts and learning models. So, to replace cognitive behaviorist approach distance learning come constructivist concepts, theoretical foundations of which were worked out by LS Vygotsky and Dewey (Miller, 2003). The heyday of the concepts identified was obtained in the process of technological breakthrough in hardware and software, is the implementation of the interaction of "many-to-many." Constructivism - a set of pedagogical theories, common goal - the study of the learning process of the individual, which is based on culture and content, and knowledge itself, is formed by the external environment.

At the beginning of this century, there is a new round of transformational pedagogical concepts of distance learning, called - connectionism. Education is the foundation of building information networks, objects and content which are applicable to the settlement of real issues, problems (Siemens, 2005a, 2005b, 2007; Downes, 2007, 2008). The information age, the network era, the availability of information technologies - fundamentals and characterization of connectionism. Concept of joint team of training is aimed at creating and maintaining a network of social relations (Davies, 2003; Phillips, 2002).

The current stage of development of pedagogical theories of distance education is characterized by the synthesis of the social practices of teaching. One of the most promising is the pedagogical concept of blended learning Blended Learning, which has its roots in the 60s. A feature of this concept is to build an effective educational process through the integration of distance learning (Distance Learning), classroom learning (Face-To-Face Learning) and online learning (Online Learning).

Each of these concepts of distance learning today occupies a niche in the overall education system of the individual. However, only at the intersection of these approaches can be formed the backbone of the future model of education professionals. Only in conjunction "computer people" today we can count on the organization of

effective educational process mediated by information and communication means, on the one hand, and the direct interaction of the teacher with the student, on the other, emphasizing its social component. In this regard, our work will be built on the basis of good practices of the Congregation of the above theories of distance learning.

MAIN FOCUS OF THE CHAPTER

Issues, Controversies, Problems

Currently, mankind has entered a new stage of its development - the era of a global knowledge society. The most important factor of structural changes in society computerization is - the penetration of information and communication technology, computer technology and telecommunications in all spheres of human activity. Global knowledge society and its economic and social characteristics dictate the need for a new core competence in IS & T, which is a kind of link between the professional and social competence and provides a steady synergistic effect.

In the context of public administration reform in the Russian Federation priority in the development of a competitive society becomes computerization of public authorities. The main goal of this reform is a complex implementation of information and communication technologies in all areas of professional work of civil servants. Computerization of public authorities provides new possibilities for comprehensive modernization of the entire system of public administration, improve the efficiency and effectiveness of government (Eremina, Nedelko, 2012) The main directions of computerization of public administration found appropriately reflected in the concept of long-term socio-economic development of Russia until 2020, Concept of the Federal Target Program "Electronic Russia (2002-2010)," National Security Strategy of Russia's Development Strategy for the Information Society in the Russian Federation, the State Program "Information Society (2011-2020)." Despite the fact that the implementation of the federal target program "Electronic Russia" and the Concept of e-government in the Russian Federation until 2010 has been completed, to training of civil servants in the field of IS & T is still not given due importance. Professional skills of most government employees are not yet fully compliant with the objectives (Kaneeva, 2013; Nedelko SI, 2009).

In accordance with the Decree of the Government of the Russian Federation dated November 17, 2008 Nº 1662-r "On the Concept of long-term socio-economic development of the Russian Federation for the period up to 2020" one of the priority directions of development of information and communication technologies in the long term is to increase the efficiency of public administration, interaction between civil society and business with public authorities, including: the creation

of "electronic government", aimed at raising the quality and accessibility of public services, simplifying procedures and reducing the time of their delivery, increased transparency of information about the activities of public authorities; ensure effective inter-agency and inter-regional exchange of information.

These findings confirm the growth of Russia's position in the ranking of e-government of the United Nations in 2014, which is calculated as an integral indicator of the three sub-indices: the index of development of e-services, the development of telecommunication infrastructure index, the Human Development Index. It should be noted that in 2012 the Russian Federation for the year, up 32 positions up and took 27th place, which occupies and still. It is interesting that Russia was the only country who has made a significant jump in the rankings in 2009-2012., whereas most developed and developing countries during the active phase of economic recession or slightly improved their position or their relatively worsened. Characteristically, it was entirely due to an increase positions of the two sub-indices - the development of electronic services and telecommunications infrastructure, while the sub-index of human capital has decreased and reached the lowest value since the inception of the rating since 2003 (Lukanin, 2014).

On the basis of the above analysis we can say that economic performance, playing a significant role in the development of computerization of Russia as a whole and in particular regions, are necessary but not sufficient condition for the successful development of e-government. Throughout the time in Russia created the regulatory framework and infrastructure for e-government services, but do not take into account the demand for e-government services and e-government services by citizens and the lack of readiness of their provision by public officials (Lukanin, 2014).

Today, as part of the federal target program "Information Society (2011-2020)", approved by Decree of the Government of the Russian Federation dated October 20, 2010 Nº 1815-p, clearly identified priority areas of information in all branches of the national economy, which entail the need for targeted, systems of training of public officers who have a high level of competence in IS & T. At the same time, it should be noted that sub-program "Information State", the implementation of which is provided under the state program of the Russian Federation "Information Society (2011-2020)", aimed at addressing the problem associated with a low level of skills in using state employees information and telecommunication technologies (Lukanin, Eremina, 2012). This is due to the chaotic training of civil servants, the lack of common IT standards in public administration at the federal level, the lack of a comprehensive legal framework, insufficient current financing to meet the challenges of e-government and the creation of a unified system for public services in electronic form.

Note that the existing and currently used abroad methodology for assessing readiness for e-government development in the majority focus on the level of

technical equipment and skills in the use of office applications and in the daily work of civil servants (Training Needs ..., 2008), and only a few of them - on the specific competencies required for successful modernization of the authorities in the effective use of the potential of modern information technologies (Fuigini et al., 2008).

Thus, the above-mentioned legal documents include the introduction to the work of civil servants tech electronic interaction with the community in the form of organizing an open interactive dialogue, the creation of a unified system of information and reference support of the population on the provision of e-government services, as well as training and retraining of civil employees in terms of IS & T.

The law requires public officials to periodically obtain additional professional education, particularly in the civil service is not less than once every three years. In accordance with state requirements, approved by the Government of the Russian Federation "On approval of state requirements for retraining, skills development and training of civil servants of the Russian Federation" dated May 6, 2008 Nº 362, additional professional education of civil servants includes their professional retraining, qualifications.

Distance learning and e-learning take in the modern system of additional vocational training strong position.

ELearning (from the usual term e-learning) is an organization of educational activities with the use of information contained in databases and used for educational programs and information that provide processing of information technology, hardware, and information and telecommunication networks, providing transmission over communication lines of this information, the interaction of students and teaching staff.

Under the distance learning technologies are understood educational technologies implemented mainly using information and telecommunication networks in indirect (at a distance) the interaction of students and teaching staff.

Despite the fact that in reality the concept of "distance learning" and "e-learning" is unequal, in Russia, they are usually treated equally and we will stick to this common position.

The basis of the educational process at E-learning is purposeful and controlled intensive independent work of the student, who can determine the sequence of development of subjects to study in a comfortable place, with individual speed, and in some cases - and in a convenient time. Therefore, the main advantage of E-learning should be regarded as a certain freedom in terms of location, time and pace of learning, making distance learning is very attractive.

Using Technology E-learning in vocational retraining and professional civil servants placing increased demands on their intellectual capacity and skills to work with information resources. At E-learning comes to the fore independent work supported by consultations with teachers.

To create an effective system of E-learning public servants need a comprehensive implementation of pedagogical, technological, organizational and economic principles of its construction.

Pedagogical principles of the system E-learning civil servants: democracy and humanism; the rising quality of education; combining theory and practice; differentiated approach to groups of students; priority of subjectivity, self-learner.

Principles of construction of the technological basis of the system of open education: standardization of processes and procedures; the modular design of technical systems; reliable and secure remote access to information resources.

Organizational principles of the system E-learning: strategic management of mass distance education of civil servants on the basis of the partnership; constant expansion of the educational environment; network organization planning production and consumption of educational products; division of pedagogical work; competition in the production of educational products.

Economic principles of the system E-learning: the union budget and extra-budgetary sources of funding; concentration of resources; cost-effectiveness; priority copyright.

More details on the evaluation and control of students' knowledge in the system of E-learning. Control of knowledge is an important and necessary part of any training. Systematic monitoring allows the lead in mastering student for a certain period of time, material, identify and define the assimilation of learning, which is especially important in the absence of "direct" contact the teacher and the student. Control exercised by the teacher, and self-control allows each of the students to see the results of their learning and cognitive activity and eliminate defects. In distance learning system to control a prerequisite knowledge can be attributed to efficiency (the ability to check and evaluate student performance on the higher school work for a minimum period of time); objectivity (analysis was performed by computer); democracy distance learning (all examinees are in the same things being equal).

The foregoing reveals the following contradictions between:

1) The objective need public administration specialists who are ready and capable of efficient operation under the conditions of e-government, and inadequate level of development of the needs of their competence in IS & T;
2) the appropriateness of the use of technology E-learning in vocational retraining and advanced training of civil servants and low skills of employees with information resources, as well as their lack of motivation to work independently;
3) Facing the task of educational institutions of mass training of civil servants through the system of distance learning and pedagogical justification no elaboration, organizational, economic and technological conditions, providing an effective solution to this problem.

Solutions and Recommendations

In order to implement the principle of continuity of public officials with an ever-increasing volume of information flow necessary to introduce into the public service for new approaches to continuous motivated to improve the professionalism and competence of civil servants in charge of implementation of the state policy in all spheres of activity.

Implementation of additional professional programs through e-learning systems should provide targeted professional development of the staff of the public service.

To increase the effectiveness of additional vocational training of civil servants in Russia and the establishment of a system of continuing professional development through e-learning in line with the challenges of modernity and development needs of the country requires the following mandatory conditions.

1. Training of civil servants through E-learning systems must be tailored to individual planning of their professional development and career advancement, and include a comprehensive assessment of the knowledge and skills of employees, received as a result of training.
2. It is necessary to improve the system of incentives for civil servants to continuous professional development, providing opportunities for career development, including E-Learning.
3. Creation of a single information resource, including basic bank additional professional programs for civil servants and bank methodical, analytical and informational materials will enable the process of self-education of civil servants on the most pressing issues of implementation of public policy.
4. In case of insufficient detailed qualification requirements for civil service positions updated bank additional professional electronic program should be formed taking into account the specifics of the professional performance of different categories and groups of civil service positions.
5. Effectiveness evaluation and control of knowledge in E-Learning civil servants should be determined by the implementation of the mandatory conditions:
    a. Suitable combinations of various forms and methods of control;
    b. The use of modern scientific methods of knowledge assessment;
    c. Appropriate control measures in a distance learning course and content from academic disciplines;
    d. Qualitative methodological support of distance learning;
    e. The presence of professional teachers.
6. It is necessary to involve the training of civil servants of the faculty staff, who have to-date information about current or planned changes in the regulatory legal acts regulating relations in the sphere of issues related to this topic.

7. Currently ongoing E-Learning system in Russia is in the process of formation and relies mainly on traditional learning technology (in terms of the theory of connectionism). The educational system of civil servants must comply with the current level of development of information science and technology (in the theory of connectionism) and give each a specialist in public authorities a wide range of tools to solve its tasks on the basis of new information technologies.
8. The effectiveness of modern e-learning technology provides students promptly update the knowledge needed to improve the effectiveness of professional activity.
9. Evaluating the impact of training of employees using e-learning technologies should be an analysis of the relevant outcomes of knowledge and competencies of employees to current and future requirements of public administration in the following blocks of knowledge:

1) Long-term goals and projects at federal and regional level; 2) general management skills and technologies, including knowledge of the methods of analysis; 3) specialized knowledge of the profile of the employee; 4) Knowledge in the field interagency employee.

Evaluating the impact of education should include identification of control unit under the presence of an employee of progressive systemic view of the development of the country and the region. This effect is achievable in the case of inclusion in the environment of additional vocational training of civil servants using e-learning technology issues relating to the basic values of the region: the cultural and historical achievements, strengths and weaknesses of the region in comparison with competing territories, prospects, opportunities to influence their achievement and, thus, the formation of a positive perception of the future and inclusion in the development process of the region.

Dedicated quality criteria are key performance indicators (KPI), which allows automating the process of evaluating the results of additional vocational training of civil servants.

Based on the theory of control, it is necessary to distinguish three stages of evaluation: preliminary, current, final.

In a preliminary step, target setting, graphic evaluation, selection and consolidation of the performers, the formation of questionnaires for survey and test items listeners and questionnaires experts. The system must be endowed with artificial intelligence, based on which (according to the criteria of importance, frequency references and sources) formed part of the key terms of information blocks and documents necessary for independent search and studying the audience.

Ongoing monitoring in general involves the collection of data characterizing the quality of an employee in the course of training under the program of additional

vocational training. This type of monitoring is realized by means of the input and output of questionnaires and tests of students (including, in addition to routine testing, psychological testing, network simulation games, etc.).

The results of the input evaluation is to identify the expectations of students and their current level of training programs on the subject of additional vocational training at the beginning of her passing. On the basis of this survey is an automatic update individual learning path in the e-learning, as well as the possibility of selection commands for network gaming and group training based on psychological and vocational testing.

Output comprehensive testing should be conducted on the day of the end of the passage of the program DPO or 7-10 days after the end of the occupation, which is preferable to assess the level of residual knowledge.

Also as part of this stage for implementation of the program of additional vocational training of civil servants using e-learning technologies is desirable to conduct surveillance expert to assess the quality of the program and the work of teachers. In the role of independent experts in our proposed monitoring system are assumed to be teachers of the leading educational institutions in the sphere of additional vocational training of civil servants, professionals or public authorities in charge of training employees. Expert assessment is based on the following parameters: evaluation of criteria and indicators of quality programs of additional vocational training of civil servants; evaluation of the structure and content of the program of additional vocational training of employees; assess the relevance and practical orientation programs; evaluation of the teaching staff, teaching methods and educational programs provide additional professional education of employees.

All data collected during these stages of monitoring evaluation and survey data managers trained employees, enter the unit assessment system e-learning.

Block assess the quality of additional vocational training in e-learning system provides: 1) an assessment of satisfaction of listeners of the program based on a comparison of expectations and satisfaction of students; 2) evaluation of the program the students' knowledge obtained by comparing the results of the input and output comprehensive survey of students; 3) evaluation of the data obtained during the monitoring by an independent expert / expert - definition of quality preparation and implementation of the program of additional vocational training; 4) assessment of the impact of the passage of the program of additional vocational training to employees on the effectiveness of its activities on the part of the head unit; 5) recommendations for further training, suitable for the employee and the profile of the team (in terms of psychological portrait).

Successful completion of the conditions and implementation of the necessary measures, in our opinion, will lay the groundwork for the resolution of existing problems and contradictions in the system of continuous education of civil servants.

FUTURE RESEARCH DIRECTIONS

Deploy mass training of civil servants is possible within the network information learning environment - Network University uniting on a contractual basis resources of many educational institutions all forms of ownership. Organizational form of such an association can act as a non-profit partnership association of educational institutions and national, regional and municipal governments as a community not only legal, but also individuals.

The activities of the network of the University should be based on a balance of interests:

- Administration of educational institutions, in terms of the expansion of educational activities: increasing the share of the market of educational services, improving the quality of educational programs, capacity utilization and maintenance of the teaching staff;
- Human resources managers and government authorities at various levels, in the part of standard training employees at 20 percent of the average composition of the governing body of the employees in the year. Minimizing the cost of additional training at the same time with the maximum mastery of the new employees professional competences;
- Civil servants who need to undergo formal training program of additional education, obtain the necessary skills in a comfortable learning environment, minimizing the time and costs;
- Teaching staff and freelancers who are interested in creating a fee of copyrighted works (training products).

Mass deployment of distance education requires the creation of own implementation platform open online courses MOOC. To develop the concept of such a platform it is advisable to collect the project team, and the creation of software to instruct domestic developers. For the operation of the platform will require a new organizational form of training institutions. This new organizational form can be networked university as educational and technological consortium, which will be based on the philosophy of open education.

CONCLUSION

- Implementation of the principle of continuity of public officials in an ever-increasing volume of information flows is not possible without the use of a system of public service motivated by new technologies continuously

improving the professionalism and competence of civil servants in charge of implementation of the state policy in all spheres of activity. The educational system of civil servants must comply with the current level of development of information science and technology and to provide those skilled in public authorities a wide range of tools to solve its tasks on the basis of modern information technologies.

- The effectiveness of modern e-learning system allows the student to quickly update the knowledge needed to improve the effectiveness of professional activity. However, the use of technologies E-learning in vocational training and retraining of civil servants has high requirements for their intellectual capacity and skills to work with information resources. At E-learning comes to the fore independent work supported by consultations with teachers. The process of self-education of civil servants on the most pressing issues of implementation of the state policy requires the creation of a single information resource, including basic bank additional professional programs for civil servants and bank methodical, analytical and informational materials.
- Training of civil servants through E-learning systems must be tailored to individual planning their professional development and career advancement, and include a comprehensive assessment of the knowledge and skills of employees, resulting learning. The effectiveness of the evaluation and control of knowledge in E-Learning civil servants should be determined by the implementation of these mandatory conditions, how to choose a combination of different forms and methods of control; using modern scientific methods of assessment of knowledge; appropriate control measures in a distance learning course content of academic disciplines; qualitative methodological support of distance learning; presence of professional teachers.
- To create an effective system of E-learning public servants need a comprehensive development and implementation of pedagogical, technological, organizational and economic principles of its construction. Deploy mass training of civil servants is possible within the network information learning environment - Network University uniting on a contractual basis resources of many educational institutions all forms of ownership. The activities of the network of the University should be based on a balance of interests administrations educational institutions, human resources managers and government authorities at various levels, teaching staff and freelancers, as well as civil servants themselves, who need to go through a formal training program of additional education, to get the right skills in the comfort learning environment, minimizing the time and costs.
- Thus, the active introduction of modern technologies E-learning in the training of civil servants, on the one hand, will stimulate the development of

skills of employees in the field of IS & T, the skills of self-education and self-organization, and, on the other hand, will significantly streamline the process of learning will provide an opportunity employees receive the necessary qualifications for them in a comfortable learning environment, minimizing the time and costs.

- Improving the system of additional vocational training of civil servants should also be aimed at the creation of a system for monitoring the professional development of civil servants, including quality monitoring and evaluation of the demand of educational programs for civil servants subject to the requirements of society and time

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Chapter 8
Development and Implementation of Adaptive Trade Policy in the Era of Digital Globalization Based on Virtual Exchange of Intellectual Knowledge

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ABSTRACT

Different countries practice economic nationalism in different ways based on their emerging priorities in the social, political, and economic contexts. Both the developed economies and developing economies are exhibiting a recent surge in economic nationalism. The increasing globalization and the growth of world markets through greater exports has threatened the economic growth of developed economies that import more than export like the U.S.A. Many Asian firms have become globally competitive by using the processes of globalization and economic nationalism. Through effective firm strategy and economic nationalistic policies of China, the

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Chinese multi-national firm Huawei has exceeded Swedish firm Ericsson for making telecommunication equipment. Other examples include Lenovo and Haier from China and Infosys from India. Many Western nations including U.S. are beginning to warm up to the idea of using economic nationalistic policies to promote their own industries and make them more competitive globally. A country's economic openness affects its economic nationalism.

INTRODUCTION

Different countries practice economic nationalism in different ways based on their emerging priorities in the social, political and economic contexts. Both the developed economies and developing economies are exhibiting a recent surge in economic nationalism. The increasing globalization and the growth of world markets through greater exports has threatened the economic growth of developed economies that import more than export like the U.S.A. Many Asian firms have become globally competitive by using the processes of globalization and economic nationalism. Through effective firm strategy and economic nationalistic policies of China, the Chinese multi-national firm Huawei has exceeded Swedish firm Erics- son for making telecommunication equipment. Other examples include Lenovo and Haier from China and Infosys from India. Many Western nations including U.S. are beginning to warm up to the idea of using economic nationalistic policies to promote their own industries and make them more competitive globally (D'Costa, 2012). A country's economic openness affects its economic nationalism. The eco- nomic interests of a country in the domestic market relative to its interests in the foreign market influence its economic nationalism sentiment. Increasing the foreign trade reduces the economic interests in the domestic market and thus weakens its economic nationalism. Using the Chinese Political Compass data and the World Value Surveys data, this prediction holds both cross-sectionally and over time.

This chapter qualitatively examines cross-national managerial strategies employed at the Japanese automakers in the context of economic nationalism. It proposes and tests a simple yet versatile conceptual framework by developing existing models and integrating foundational concepts available in literature. Proposed as a tool for comparative analysis on management styles, the framework has two extreme ends of a continuum to capture not only variants of the social realities but also changes of businesses as it shift between the extremes. The findings suggest that the force of economic nationalism likely affects the Japanese automakers' growth strategies, and the dynamics of managerial styles are company-specific under intensified globalization.

The automobile industry, which constitutes a part of the manufacturing sector, has large multinationals, such as Toyota Motor Corporation ("Toyota"), Honda Motor Co., Ltd. ("Honda"), and Nissan Motor Co, Ltd. ("Nissan"). The major industry players have an extensive global network with localized subsidiaries worldwide. Toyota places a public release, dated January 16, 2018, on their website regarding their annual output in North America: With 46.5 thousand employees, Toyota manufactured 2.0 million vehicles in 2017. Despite their large-scale operations in the US, the Japanese automakers may need to expand further their establishments. Dated November 6, 2017, CNN online news features President Trumpâ€™s trip to Japan and communication with Japan, Inc., including executives from the automakers. With the mission of reducing the national's trade deficit with Japan by $57 billion, the President asked them to increase the production of cars in the US instead of exporting from Japan. The mission appears to exemplify the current issue of economic nationalism, which tends to promote trade protectionism that can limit imports (Pryke, 2012).

Cross-national management has been an interest of researchers and practitioners. Takeo Fujisawa, cofounder of Honda, once explained his professional journey:

Japanese and American management is 95 percent the same and differs in all important respects. – T. Fujisawa, Cofounder, Honda Motor Corporation (Adler, 2000, xiii)

What differs between Japanese and American management, if not extinct, may not exactly be five percent today. However, it can be hasty to say that the two styles of management have converged with no material differences between them. This line of discussion seems to pose the question of how the Japanese multinationals manage their US operations and reconcile the "five percent" portion in the context of economic nationalism currently being intensified in the USA. Under such circumstances, the Japanese automakers may make more foreign direct investments in the USA for further growth and/or survival in the fierce competition. If the significance of the "five percent" portion is great, the two management styles will likely have more negotiations in cross-national settings. The difference of management styles seems to have direct relevance to the issue of economic nationalism, especially in the case of the country combination of Japan and the USA. This chapter will discuss the following three research questions: what elements constitute the "five percent" portion, why the two styles of manage-ment are different, and how the portion will possibly change in the context of economic nationalism, focusing on "all important respects". This research has turned into the proposition of a new framework by developing existing models available in literature. The framework may be used to analyze management styles and their changes in the context of economic nationalism.

The existing body of literature offers rich discussions over the cross-national differences. Notably, Sako (1992) provides a useful framework entitled Arm's-Length Contractual Relation ("ACR") and Obligational Business Relation ("OCR"), based on important evidence discovered in the electronics industry in the UK, where the local and the Japanese businesses were compared for Sako's study. ACR-OCR has two extreme ends of a continuum to capture any variants of the social realities sitting between the extremes. Also pertinent is the conceptual framework of liberal market economies ("LME"s) and coordinated economies ("CME"s) in the field of political economies (Hall and Soskice, 2001). Integrating these two frameworks, this chapter will propose a three-level framework named Arm's-Length Business Relation ("ABR") and Obligational Business Relation ("OBR"), and test its theoretical validity. It is partially named after ACR-OCR because it is partly built on ACR-OCR. It differs from ACR-OCR in that it assumes general applicability to any trading relations between Japan and other countries, while ACR-OCR has its theoretical coverage of the electronics industry in Japan and the UK. The ABR-OBR framework is structured to be as all-embracing as possible. This chapter will begin with a review on ACR-OCR and LME-CME, establish the framework, and tests it against the qualitative findings obtained from the automobile industry.

This chapter qualitatively examines cross-national managerial strategies employed at the Japanese automakers in the context of economic nationalism. It proposes and tests a simple yet versatile conceptual framework by developing existing models and integrating foundational concepts available in literature. Proposed as a tool for comparative analysis on management styles, the framework has two extreme ends of a continuum to capture not only variants of the social realities but also changes of businesses as it shifts between the extremes. The findings suggest that the force of economic nationalism likely affects the Japanese automakers' growth strategies, and the dynamics of managerial styles are company-specific under intensified globalization.

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any trading relations between Japan and other countries, while ACR-OCR has its theoretical coverage of the electronics industry in Japan and the UK. The ABR-OBR framework is structured to be as all-embracing as possible. This chapter will begin with a review on ACR-OCR and LME-CME, establish the framework, and tests it against the qualitative findings obtained from the automobile industry.

The failure of some African Union member-nations including Nigeria to endorse the African Continental Free Trade Agreement (AfCFTA) that would create one of the largest free trade areas in the world has provoked a lot of controversies that are yet to be resolved. While some of the relevant stakeholders in the countries that have refused to sign the treaty are urging the heads of their countries' governments to withhold assent until when all the contending issues regarding the AfCFTA are amicably settled, others desire to have the agreement signed in order to harness its benefits for the continent. As the controversies' rage, it appears that the implementation of the much-awaited agreement has been put on hold, thus thwarting the progress of the continent. This chapter therefore wades through the controversies and points the way ahead for the AfCFTA to be acceptable by all.

In this globalization era, there is no denying the fact that the economies of the world have become increasingly linked, through expanded international trade in services as well as primary and manufactured goods, through portfolio investments such as international loans and purchases of stock, and through direct foreign investment, especially on the part of large multinational corporations (Todaro & Smith 2011, Giddens & Sutton 2013). These linkages have had a profound effect on the developing world as the developing countries import and export more from each other, as well as from the developed countries.

Globalization is one of the most frequently used terminologies in the discussion of development, trade and international political economy (World Bank 2000, Anderson, Cavanaugh & Lee 2000, Saach 2000, Rodrik 1998, Dollar & Kraay 2000). From the economic standpoint, it is a process by which the economies of the world become more integrated, leading to a global economy and, increasingly, global economic policy making (Giddens 2001, Todaro & Smith 2013), for example, through international agencies such as World Trade Organization.

The emergence of international or multinational firms has been largely due to the globalization efforts which have created the new market opportunities of these firms. However, there has come to be, in recent times, a new trend of economic nationalism that tends to limit their operations worldwide. Championed by some developed countries and the 'Third World' the objective is to support economic activity and promote social cohesion. Some manifestations of economic nationalism are attempts to block foreign competition or acquisition of domestic companies.

Rising economic nationalism, according to Jaruzelski (2017), could encourage the continuation of protectionist policies in many countries which may affect corporate

decisions about Research and Development. For example, China has pursued trade and intellectual property practices that many companies and global institutions consider overly restrictive. These include industrial policies and nontariff measures that in some cases favour domestic over foreign companies, the dominant positions of state-owned enterprises in some sectors, unequal access to subsidies and financing, and inadequate protection and enforcement of intellectual property rights.

Disparte and Wagner (2016) averred that the trend toward economic nationalism has been fueled by greater global income inequality, growing dependency on individual commodities for government revenues, too many countries hitching their economic fortunes on China, and an increasing propensity for oil producing countries to continue to produce oil outside proscribed multilateral agreements. The new wave of economic nationalism, which has prompted an increasing number of governments (developed and developing) to nationalize or re-nationalize strategy assets, will likely lead to an increase in the expropriation of more foreign assets in the oil and gas industry, manufacturing, and other sectors, acquisition of domestic companies affiliated to the multinational firms, decrease in trade, and foreign direct investment.

Over the years, it has become fashionable for nations to enter into free trade agreements at the regional, continental and global levels to facilitate economic growth, as well as ease the free movement of people and factors of production across national boundaries. Free trade, the importation and exportation of goods without any barriers in the form of tariffs, quotas, or other governmental restrictions to inter-national trade promotes liberalization, and allows each country to specialize in the goods it can produce cheaply and efficiently relative to other countries. Such specialization enables all countries to achieve higher real incomes (Irwin 1996).

In the past several decades, trade optimists have come to terms with the benefits of trade liberalization hence the tendency to downplay the role of international demand in determining the gains from trade and focus on the relationship between trade policy, export performance, and economic growth (Lal & Rajapatirana 1987). They argued that trade liberalization (including export promotion, currency devaluation, removal of trade restrictions, and generally "getting prices right") generates rapid export and economic growth because free trade provides a number of incentives:

It promotes competition, improved resource allocation, and economics of scale in areas where developing countries have a comparative advantage. Costs of production are consequently lowered.

CONCLUSION

The current world economy is interconnected; however, due to recent economic crises, trade deficits, and nationalist movements, there is a political trend of economic nationalism that is taking root in countries around the world. As such, global economies around the world are decreasing their international trade and introducing import tariffs and economic protectionism. International Firms' Economic Nationalism and Trade Policies in the Globalization Era provides a comprehensive understanding of the recent rise of economic nationalism in the context of the hyper-connected global economy by providing strategies and country-specific solutions for domestic and international firms. Covering how multinational corporations can overcome the protectionist sentiments while reinventing their corporate social responsibility models, it showcases how economic nationalism and globalization can successfully coexist.

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Chapter 9
Development and Implementation of Digital Tools, Neural Networks, and Cyber Control Systems in Sliding Modes

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ABSTRACT

This chapter seeks to understand the EU-ACP trade relations under the economic partnership agreement (EPA) arrangement and its implications on economic nationalism of developing nations with specific reference to Zimbabwe. The research strongly leans on the view that EPAs have little or no economic benefit to the ACP. Even though the EU tagged the ensuing trade relationship with the ACP as partnership, in the real sense, it is more of paternalism. This is especially so as the EU dictates the terms and the pace of the negotiation, owns the incentives (in the form of aid and technical assistance), and either dispenses or withdraws it at will, depending on the "behavior" of the ACP countries. In order to benefit from EPAs, ACP countries must fund their own economies. ACP states should also address internal political challenges before committing to multiple economic fronts such as the EPAs.

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INTRODUCTION

This chapter seeks to understand the EU-ACP trade relations under the economic partnership agreement (EPA) arrangement and its implications on economic nationalism of developing nations with specific reference to Zimbabwe. The research strongly leans on the view that EPAs have little or no economic benefit to the ACP. Even though the EU tagged the ensuing trade relationship with the ACP as partnership, in the real sense, it is more of paternalism. This is especially so as the EU dictates the terms and the pace of the negotiation, owns the incentives (in the form of aid and technical assistance), and either dispenses or withdraws it at will, depending on the "behavior" of the ACP countries. In order to benefit from EPAs, ACP countries must fund their own economies. ACP states should also address internal political challenges before committing to multiple economic fronts such as the EPAs.

The European Union (EU)'s trading relations with the 77 members of the African, Caribbean and Pacific (ACP) countries have historically been framed by a series of conventions. Some of the conventions granted unilateral preference to the ACP countries on the EU market using the Most Favored Nation (MFN) principle which states that a nation will choose who it wants to offer trade preferences (Fontagné, Laborde, and Mitaritonna, 2008). Although the ACP countries are among the most vulnerable countries in the global trading system, the conventions nevertheless violated World Trade Organization (WTO) rules as they established unfair discrimination between developing countries and therefore a change was required.

The pace of globalization is increasing, with unprecedented flows of goods, services and people between countries and companies. Levels of overseas investment and foreign ownership have risen dramatically, alongside far-reaching changes in technology, production and corporate organization. National economies and companies are becoming ever more interdependent, and emerging economies such as China and India are competing in world markets in a way that few could have imagined in the 20th century (Cooper, 2007).

For the purposes of negotiations, the 77 ACP countries have been grouped into six negotiation regions (West Africa, Central Africa, Eastern and Southern Africa, the Caribbean and the Pacific) based on existing regional integration institutions (Heron and Siles- BrÃ¼gge, 2011). All these regions established Free Trade Areas (FTA) for goods between the EU and various ACP countries that are compatible with the provisions of Article XXIV of GATT. The objectives of this study are to assess the impact of EPAs in ACP economies, analyses the regional economic trade agreements for ACP countries under the EU-EPAs arrangement and to understand the benefits of EPAs to ACP countries.

ACP States have consistently noted that the European Union has not given adequate attention to the development chapters in the interim EPAs.42 Many ACP

States have expressed reservations at the heavy pressure from the European Union to sign EPAs even while they may not represent the best interests of ACP countries. The EPAs were scheduled to be implemented by 1 January 2008. However, owing to lack of agreement in negotiations between the European Union and ACP, the EPAs were not concluded within the specified period and both parties decided to enter into "interim agreements" instead that conformed to WTO rules on trade in goods (European Commission, 2017).

EPAs were introduced to resolve non-reciprocity and the Generalized Scheme of Preference (GSP) were introduced to move the EU-ACP agreements forward after stalling over EPA's. The GSP allows vulnerable developing countries to pay less or no duty on exports to the EU, giving them total access to the EU markets and contributing to their growth. After the collapse of the Doha Agreement in 2015 questions have been raised over the future of the EPAs, and multilateral cooperation to addressing global disparities in development and trade (Financial Times, December 21, 2015). Economic Partnership Agreements (EPAs) respond to the need for change: they take a new, more comprehensive approach, tackle all barriers to trade, mostly through re-enforcing regional integration and addressing supply-side constraints, and form secure, World Trade Organizations (WTO)-compatible trade arrangements.

The Concept of Economic Nationalism

Economic nationalism is a set of practices to create, bolster and protect national economies in the context of world markets (Pryke, 2012). Most of the literature that mentions economic nationalism directly refers.

The aim of this chapter is to study the impact of the selected macroeconomic indicators on unemployment rate in the region of Western Balkan countries and, more specifically, Albania, Serbia, Macedonia, Montenegro, Bosnia-Herzegovina, and Kosovo. This research is based on the time period 2000 to 2017 and includes five countries and the econometric model used in here is panel data. Data are retrieved from official and trustable sources such as World Bank and International Monetary Fund (IMF). The methodology used is the vector autoregressive model (VAR), unit root test, Hausman test, Granger causality test. All the macroeconomic variables, inflation, interest rates, GDP, and FDI are found to have a significant impact on unemployment rate of this group of countries. The novelty of this study remains the fact that this analysis is performed for the Western Balkan countries as a group. The results can serve and can be taken into consideration when applying similar econometric analysis in the future researches or implementing new policies that influences the macroeconomic factors.

The Western Balkans is a geopolitical term coined by the governing bodies of the European Union in the early 2000s and referring to those countries in south-

eastern Europe that were not EU members or candidates at the time but could aspire to join the bloc (Dabrowski and Myachenkova, 2018). At the very beginning the Western Balkan region was composed of Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia and Croatia. Since 2013 Croatia is part of European Union. As all the countries or the regions, the Western Balkans (WB) have their ups and downs. In the 1990s, the Western Balkans suffered from different conflicts, which negatively impacted the political, economic and social environment in this region. Meanwhile, the prospect of EU accession and the global boom in 2000s made possible some emerged reforms within the institutions and pushed the economy to recover. These positive steps were seen as promoter of economic growth of the whole region. But again, the financial crisis of 2007 has its negative impact even in this region.

One specific to this region is that the Western Balkan countries have huge similarities in the culture, social norms, languages, background and historical past. As so, these countries are considered as group highly affecting each other and becoming like this as a single zone. The study of this region is crucial to understand the gaps and ambiguities showing up. If the WB countries are considered a "common zone", the steps toward a prosperous economy and a better future would be much easier since they do influence each other and, somehow, they consider the countries of the region their competitor. In the last years all the countries except Albania have seen much faster growth of exports than of GDP. And what is crucial, the exports toward EU have increased faster than the rest of the region. Another indicator supporting the non-economic nationalism of the WB countries is that apart from Albania and Serbia, all the other countries use euro of have fixed exchange regime based on the euro. According to Gligorov, in 2017, the intra-ethnic political competition and growing exports in Western Balkan countries have been supportive of democracy and free trade and have kept in check nationalism and protectionism respectively.

Labor market in the selected region has high unemployment rate. Unemployment is an important issue which affects society politically and economically. A large number of authors have been writing through years about the problems that labor market presents, emphasizing unemployment. Western Balkan economies have a considerable number of similarities among them in terms of labor market conditions and developments. Their remarkable challenge is high unemployment rate.

Labor market in the selected region has high unemployment rate. Unemployment is an important issue which affects society politically and economically. A large number of authors have been writing through years about the problems that labor market presents, emphasizing unemployment. Western Balkan economies have a considerable number of similarities among them in terms of labor market conditions and developments. Their remarkable challenge is high unemployment rate.

People are unemployed because of different reasons, and these reasons divide unemployment into six main categories (Mankiw, 2003). The first one is frictional unemployment, which is a short-run unemployment that comes from the condition of searching for a new job. The second type is structural unemployment, which is a persistent unemployment that happens when wages in labor markets do not balance supply and demand. The third and most often type of unemployment is cyclical unemployment, which is related with the ups and downs of the economy. The fourth type of unemployment is the seasonal one, which is related to seasonal nature of the product or service. The fifth type of unemployment is the voluntary one, which includes that group of people who choose not to work for different reasons. The last but not least type of unemployment is the hidden one, which does not appear in government statistics, due to the way the statistics are collected (Mankiw, 2003).

Factors affecting unemployment rate are macroeconomic indicators. These indicators are economic statistics which are released periodically by government agencies and private organizations.

Nationalism is not closing the door to other nations. On the contrary, sometimes it exhibits as crazy expansion. For example, during the Second World War, both Adolf Hitler and Emperor of Japan claimed that they are helping their citizens. However, that is not the truth. Both German and Japanese people suffered something that they wouldn't have suffered without this war. Meanwhile, nationalism is one reason that the other countries keep fighting the war. By observing the relationship among nationalism, government policies and intervention, and FDI, this chapter attempts to offer an understanding of how FDI is impacted by the nationalism and government policies and intervention by providing two cases: the Brexit of the UK and the "American First" of the USA.

The OECD (Organization for Economic Co-operation and Development) offers definitions of FDI. In term of the BD4 (OECD Benchmark Definition of Foreign Direct Investment: 4th Edition, 2008), FDI is an investment made from a foreign economy acquiring a constant interest, such as managerial power in the targeted corporations and entrance to a certain market, which otherwise inaccessible to the investors. The country of origin of the firm is the home country and the foreign country is the host country. In essential, FDI builds an economic bridge linking home countries and host countries. From a host country perspective, direct investment in any form by a foreign MNE is the inward direct investment and this is the outward direct investment for the home country. It can enhance the corporation and national economic development, competitive capability for the countries, and technology improvement.

Therefore, FDI is different from the international trade. However, it was born from the international trade. Motivations of FDI originate from avoiding uncertainties because markets are not perfect as well. The market imperfections give both country-

specific and company-specific advantages. Thus MNEs (Multinational Enterprises) located in different countries invest in other countries to seek their country-specific advantage and avoid risks from their home countries (Dunning, 1988; Dunning, 2001). John Dunning (1998 & 2000) proposes four basic motivations for corporations to involve in FDI. (1) Corporations chasing specific natural resources, low labor cost, or technological, managerial, or organizational technology, are resource seeking motivated. (2) Corporations tending to enter a new or large market are market seeking motivated. (3) Corporations diversifying risk or enhancing the economic scope and scale are efficiency seeking motivated. (4) Corporations trying to hold the position of competitiveness, in the long run, are strategic-asset seeking motivation. Therefore, through FDI, corporations which invest in foreign countries explore new markets, channels, save on production facilities and access the new technology and newer ways of conducting business. In addition, companies which receive the FDI can gain new managerial skill, high wages. In sum, FDI is a way to avoid risk in corporation's domestic country. It can be pushed out or pulled in some countries for different motivations.

Economic Nationalism

Nationalism is "loyalty and devotion to a nation", a definition that recalls the idea of "imagined communities" proposed by Anderson (1983). However, while we talk about economics, especially international economics, "a nation" is as an economy – territorially defined - which interacts with other national economies, for trade, investments, technological transfer, etc. Therefore, essentially, in a globalized world economy, economic nationalism is often self-contradictory; but, it does exist, and cannot be ignored.

Nationalism can manifest itself in different forms. It not only closes the door to the other nations (autarchic policies) but also exhibits as crazy expansion, sometimes, combining autarchy and imperialism. For example, during the Second World War, both Adolf Hitler, Benito Mussolini and Emperor of Japan claimed that they were helping their citizens. However, all German, Italian and Japanese people suffered something that they would not have suffered without this war. These people could have lived in a peaceful environment, so as the victims. We may infer from this disaster that a rigid nationalism could not help any society, even though it seems like can at the very beginning, eventually it will bring more damage than benefit.

Economic nationalism presents similar contradictions as political nationalism. Economic nationalism never disappears. While the economic development decreases, the economic nationalism increases. When economy depressing, citizens who are instigated by politicians, start blaming the foreign countries, for example accusing immigrants of stealing jobs (Ali, 2017; Iliescu, 2017).

GOVERNMENTS INTERVENE IN INTERNATIONAL BUSINESS AND FDI

According to Wild & Wild (2014), governments have a long history intervening in the international business. There are three main reasons: culture, politics, and economics, for governments to limit free trade. Culturally, governments intervene in international business to protect national identity when the government believes the cultural imperialism is harmful, and because trade and culture impact each other. Politically, governments restrict international business to protect jobs, preserve national security.

This chapter addresses conceptual relationships between corporate social responsibility (CSR) and a set of related phenomena typically labeled as economic nationalism, economic patriotism, economic protectionism, populism, and antiglobalization. The research question addressed is whether this set of related phenomena redefines or at least affects CSR in significant ways that practitioners and scholars should include in the conception of CSR and, if so, how theoretically. Such investigation is affected by two essential circumstances. First, CSR remains a topic of continuing theoretical controversy: specific "responsibility" of any business anywhere is not a resolved matter. Second, economic nationalism and related phenomena—which appear to be rising in importance—are opposed to the economic, political, and social globalization effects following the 1995 founding of the World Trade Organization (WTO). The chapter seeks to refine CSR for varying conditions as shaped by economic nationalism, economic patriotism, economic protectionism, populism, and antiglobalization.

This chapter investigates the implications of increasing economic nationalism for corporate social responsibility (CSR) theories and practices. Economic nationalism, one approach to international economic relationships, emphasizes that state policies and home-country businesses should promote national self-interest relative to international cooperation if occurring at national cost. Countries differ in economic nationalism or increased economic nationalism, which facilitates a comparative perspective. Economic nationalism is a continuum from relatively low, especially in open economies in Switzerland and the Nordic countries, to relatively high in countries like the United States, China, and Russia.

The main ideas and findings of the chapter are as follows. Economic nationalism is part of a rising tide of related phenomena, including economic patriotism, economic protectionism, populism, and antiglobalization (Nelson, 2017). These phenomena are part of the broad context for the economic nationalism discussed in this chapter. CSR theorizing and practices can adjust to increasing variation in economic nationalism conditions. Viewing economic nationalism as a set of state-level policies, an empirical question is whether CSR of specific businesses are

responding to variable country conditions. CSR implications may differ considerably based on privately-owned domestic businesses and privately-owned multinational enterprises (MNEs), both distinct from state-owned enterprises (SOEs) operating domestically or increasingly internationally. The chapter draws on empirical data and case instances to validate these arguments.

Economic nationalism involves varieties of three kinds discussed in this chapter. One variation is the increasing international aggressiveness of China and Russia (an oil producer), as each is a one-party authoritarian regime of different types (Associated Press, 2018b). Iran (also an oil producer) and North Korea, both pursuing nuclear weapons and regional dominance, are special situations of international aggressiveness. A second variety is a negative reaction to globalization in some advanced economies, most notably to date the U.S. and the UK, which is in the process of Brexit from the European Union (EU). A third variety (of different types) involves developing countries, including Brazil, India, South Africa, and Saudi Arabia (an oil producer).

The objectives of the chapter are as follows:

- The chapter aims to provide a conceptual discussion of the basic ideas concerning CSR in relation to economic nationalism. Other related phenomena (i.e., economic patriotism, economic protectionism, populism, and antiglobalization) are the broad context for economic nationalism.
- The chapter offers working definitions of this set of phenomena.
- The chapter places economic nationalism within the setting of international economic relationships established through the World Trade Organization (WTO). It gives attention to disputes occurring between the U.S. and the North American Free Trade Agreement (NAFTA), as well as between the UK and the EU.
- Beyond the conceptual discussion and working definitions, another objective is to note company examples and empirical evidence concerning SOEs illustrating the crucial issues.
- The final objective is to propose refinements of CSR for accommodating economic nationalism as a real-world consideration. The author suggests that CSR theorizing must address the likelihood of alternative models for business-society relationships considering the shift from a WTO-oriented freer trade and investment setting to a more hostile environment for international economic relations. This shift occurs in conjunction with a resurgence of aggressive nations, including China, Iran, North Korea, and Russia.

The chapter proceeds as follows. The background section provides working definitions of the basic terms, together with a review of related literature. The third

section addresses refining the CSR conception considering problems in the WTO approach and the emerging UN human rights regime. The fourth section considers solutions and recommendations for these issues. The fifth section addresses future research trends. The conclusion reviews the essential points of the chapter.

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Chapter 10
Development of Avatar-Based Models and Tools for People With Intellectual Disabilities:
As an Innovation System in Digital Era

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ABSTRACT

The chapter is about development of consciousness, emotion, motivation, and level of aspiration, with the ways that people react to the psychological, traumatic experience caused by the gradual realization of incapacity. Some people with an intellectual disability are capable of learning together with normally-developing peers if provided with special support; however, there are others who will need an individual education program adapted to their capabilities. The most important focus in working with such students is the individual approach with regard to the specific mentality and health of each person. Such an approach can be achieved through instructional methods like avatar-based learning as the improved development of project-based learning.

INTRODUCTION

Teachers who may have a student with an intellectual or cognitive disability in their general education classroom need to be aware of several things in order to assist the pupil in being successful. First, the general education teacher needs to understand that these students can learn the general education curriculum; however, it may take

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them longer than their grade-level peers to grasp a concept. Second, when teaching a student with this type of disability, the educator should be as concrete in the lesson as possible because abstract concepts are difficult for these students to understand. Also, breaking down the concepts into smaller increments, or chunking the material, will benefit the student greatly. Fourth, often students with an intellectual disability can only understand one- and two-step directions. Giving the student a small task to accomplish before moving on to the next one is good teaching practice for any teacher. Finally, teachers should provide the student with lots of sincere, positive affirmations. Do not simply tell the student that he or she is doing a good job but also include in what way they are doing a good job (e.g., "You are doing a good job at counting coins"). This will assist students with their self-esteem and encourage independence.

Presumably, it is much more difficult to implement inclusive education when teaching students with intellectual disabilities. However, providing individual education to one or several students with intellectual development disorders in a group with normally developing students has some advantages. There is no need to set up a separate group of intellectually challenged students; those students have a better chance to adapt to life and work among normally developing people, and they will have a wider choice of jobs. However, this mode of learning assumes that the intellectually challenged pupils have an adequate level of general educational preparation and effective communication skills.

Education of students with intellectual development disorders requires special psychological assistance at all grade levels. To update curricula and programs with regard to psychophysical and cognitive features of students with intellectual disabilities and with regard to their abilities and capabilities, it is necessary to considerably reduce the range and depth of the study material and to simplify its structure. Students with intellectual development disorders should be given much narrower curriculum knowledge and skills, and perhaps a number of concepts should be entirely excluded. Therefore, it is necessary to develop an individualized educational program and to modify the curriculum.

Students with intellectual disabilities practice concrete thinking, and the teaching material that is not associated with their personal experience does not interest them, whereas things relating to their activities in everyday life are grasped more easily. In addition, students with intellectual development disorders have a relatively low level of consciousness and evaluation of their own behavior, which manifests itself in inadequate actions and negative personal qualities (e.g., they do not keep appropriate distances away from people, they demonstrate unreasonable claims to surrounding people, they exhibit foolishness, shyness, etc.). Students with intellectual disabilities need constant support to reassure them that they are doing a suitable job on a task.

When students with intellectual disabilities find themselves in a new group, they may experience considerable adaptation difficulties. At times, they may feel stress caused by the change in sociocultural and communicative environment, social status, requirements to learning, and individual psychological issues. Thus, it is essential to provide support both physically and emotionally to decrease inevitable emotional pressure, establish productive and emotionally positive interpersonal contacts, promote personal development and normalization of self-assessment, and encourage adequate identity in the student with intellectual disabilities. To overcome the student's isolation, teachers should speak with parents, other students and teachers, and the student him or herself to offer trainings and promote teamwork.

Students' behaviors can be improved by participating in games, role-playing, and trainings. Teachers should seek to employ methods to help students learn how to navigate social situations and academic challenges. Gradually, students develop communicative skills based on qualities such as self-respect, perseverance, and improved self-control and at the same time develop modesty, motives, and values.

The development of self-control for students with an intellectual disability occurs in several stages. In the first stage, students should learn to understand and accept the teacher's control. To achieve that, the teacher should:

- Acquaint pupils with norms and criteria used to assess their knowledge and skills.
- Explain why the student gets a certain grade, depending on assessment criteria.
- Ask students to assess their activities independently and to explain their conclusions.

In the second stage, students should learn to observe and analyze how their friends learn. To achieve that, the teacher should encourage students to:

- Check each other's homework and exercises done independently. While checking, students compare their answers, look for mistakes, and explain to each other how they arrived at a specific answer.
- When the check is over, the teacher should use the whiteboard to write down the right answers and show ways to solve difficult tasks, while the students should check their answers a second time.
- While checking each other's work, the students should know that the goal of such activities is not to get a grade but to check how deeply and properly they know the topic, whether they can do a certain task independently, and whether they can analyze one another's results.

Checking each other serves as a good way of learning self-control. After all, it is much easier to find mistakes in your schoolmate's work than in your own, and students transfer the acquired skills of control to their activities (e.g., self-checking). In this stage, the following strategies should be implemented:

- Suggest that students assess schoolmates' answers and ask questions and comment on the answers; next, have them express their views about results, ideas, and solutions; finally, have them try to offer another answer or option to tackle the problem.
- Teach students to supervise the teacher's activity and encourage them to ask questions of the teacher.
- Show typical mistakes. This can be done explicitly, but it is possible to tell students a story where logical connections are broken deliberately, and students should then be able to discover those breaks in logic.

In the third stage, students learn to supervise their own learning activities, to introspectively examine them, and to conduct self-assessment and self-correction. The students' ability to be introspective and conduct a self-assessment affects teaching results, students' ambitions related to learning, and appropriate responses to the teacher's assessment of their activities. Introspection and self-assessment require that students know themselves and their learning, analyze their activity, determine the efficiency of their work, create motives, and determine needs and possibilities to reorganize and improve their learning. Self-correction is a necessary stage of learning since it helps students continue their education. By conducting self-correction and regulating their actions, students create an internal pattern and model knowledge and action, which, if necessary, they can instantly recall in order to compare it with external activities.

To develop students' skills to conduct introspection and self-correction, the teacher should:

- Teach students to check at home how well they know the material by making a plan of what they read and then having the students retell the main points, answer questions in their textbooks, make up additional questions from the texts, and compare the new information to what they learned before.
- Help students develop the habits of analyzing their results and checking whether they did their tasks correctly.
- Avoid giving a certain grade if a student has given an incorrect answer. Rather, it is better to allow the students to find their mistakes, and if they do so, not mark them down.

- Avoid reproaching students for trying to get a higher grade if they make mistakes in self-assessment. In this case, it is necessary to help each student realize why they have given themselves this particular grade and to assist them in understanding assessment standards so that they can use them properly.

The teacher should not put down an unsatisfactory grade in the gradebook immediately. Instead, the teacher should give students two weeks to correct mistakes and have their skills assessed once again. Students learn to monitor things they did not learn properly and ask, "What do I have to do to improve my skills?"

Self-control is crucial for completing independent tasks and homework. Correction is the first form of self-control. Corrections often make students' work look untidy, but it is an indication that students have checked their work and corrected their mistakes. The teacher should not criticize but teach students to do it carefully instead. Teachers are advised to use the following methods in order to develop the skills of self-control and self-assessment.

- Colorful assessment. Students draw two circles at the bottom of the page. Having assessed their work, children paint over one circle; the other circle is painted over by the teacher during the check. The meaning of colors is described in advance. For example, a red color would mean success; a green color would mean that the student has made some mistakes, but did his/her best; dark blue would mean, "It has turned out badly; I'm dissatisfied with my work"; and a yellow color would mean, "I cannot assess it." At the beginning of the next lesson, students find out how they will be assessed themselves and how the teacher will assess them.
- Comparison with standards. Once they have done their tasks, students compare their results with the standards given on the whiteboard.
- An unfinished sentence. At the end of the lesson, the teacher suggests that students choose a couple of sentences and complete them—e.g., "Today I am happy with what I did because …," "Today I failed to …," "I really liked to …," "I was surprised …," and so forth.
- Catch an error. The teacher writes a task on the whiteboard (a scheme, a drawing, or a table) that has a mistake. Students have to find it and correct it. There can be several mistakes.

Finally, educators should use general research-based strategies to teach students with disabilities. The following are some basic research-based strategies for teaching students with intellectual disabilities (Lozovskaya et al., 2015a).

- Use methods that stimulate students' cognitive activity, develop their oral and written speech, and develop necessary learning skills.
- Show various techniques for memorizing, such as a mnemonic device, that allow students to improve their abilities considerably (grouping of words and pictures, establishment of communications, etc.).
- Prevent exhaustion, using various means for this purpose (interchange of intellectual and practical activities, "chunking," and use of interesting and colorful didactic material and presentation devices).
- Apply an individual approach, taking into account emotional and volitional spheres, that uses game situations and game-based trainings to promote the ability to communicate with others.
- Create situations for success in learning activities.
- Change activities during lessons (have sports breaks, change the children's position—let them work standing or sitting).
- Vary academic difficulty.
- Ensure that students attend lessons regularly.
- Check students' homework regularly (they should do all exercises the teacher sets as their home tasks).

BACKGROUND

To choose the curricular material for students with intellectual disabilities, it is necessary to find out what is available that does not excessively simplify the material. Curricular material becomes an effective means to stimulate learning if it is appropriate for students' mental and intellectual capabilities and addresses their needs. Because the group of children with disabilities is extremely non-uniform, teachers should select certain materials for certain situations and choose teaching methods and forms to suit these materials and students' capabilities. The following presents an example of including intellectually disabled students in the general education arena, using biology as an example classroom.

Biology teaching should be associated with real life. It is necessary to design and reproduce difficult situations that students will have to handle in ordinary life. Their analysis and simulation can form a basis for positive changes in students' development, for the better understanding of the material, and for the development of necessary skills.

Remedial biology education within the framework of inclusive education aims to improve not only knowledge and mental functions but also mutual relations. It is possible only if students learn in close cooperation with adults and peers. Any correction is based on a real-life situation. This can help simulate difficult situations

and show the student how to handle them. Activities help recreate the form of interaction that meets the requirements of a social environment.

One of the most effective forms of interaction is group work on a project. When used purposefully and regularly, the method allows students to learn to consciously set goals and objectives, to assess new experience, and to ensure that their actions are efficient.

Analysis of psychoeducational and methodical literature and an earlier study allow us to reveal the following characteristics related to the methods of biology teaching within the framework of inclusive education (Lozovskaya et al., 2015a, 2015b):

- Educational programs are adapted for students' special psychophysical capabilities to meet the requirements of inclusive education.
- During lessons, teachers use methods that encourage both children with disabilities and nondisabled students in the same class.
- Teachers create situations of personal development and develop parameters that are significant for individual development.
- Teachers use special equipment along with the basic technical and didactic aids meant for biology teaching.
- Students with disabilities have an assistant (a volunteer from among schoolmates or senior pupils) who provides help during lessons and/or extracurricular activities.
- Cooperation and the technology of project-based research activities (the project method) become the chief technologies used in teaching.

The most appropriate methods to help teachers work with students with intellectual disabilities are methods that involve explanation and illustration, reproduction, partial search, communication, quality monitoring, and self- and mutual control. These research-based instructional strategies focus on the best possibilities to help students with intellectual disabilities learn how to organize their activities, which will allow them to move consciously toward their goal of living independently. In the organization of learning, the main difficulty for the teacher consists in correlating specific features of the disabled child while integrating him or her into the environment of normally developing peers. Integrating a child with intellectual disabilities into a new group might be an ordeal for other children, teachers, and parents. When children with disabilities find themselves in a new group, they look for friends that have similar character traits, interests, and abilities. Therefore, it is advisable to create cooperating groups in order to create an environment for children with disabilities that help them integrate into a large group.

In order to form cooperating groups, it is essential to pay attention to personal qualities such as a certain level of intellectual development (which manifests itself

in inquisitiveness, the interest in the surrounding world, and the need to discover new things) and a certain level of competence in the subject (characterized by group acceptance/non-acceptance of the student, and the student's acceptance/non-acceptance of group work). This makes the situation less stressful, reduces the adaptation period, brings children together and helps teach them more efficiently, enables teachers to form cooperating groups more efficiently, and develops students' communicative competencies smoothly.

As an additional parameter, the emotional intensity of the student should be considered (e.g., internal comfort/discomfort in learning as an obligatory kind of cognitive activity). Students' group work can be adversely affected by negative emotions (initially anger) and experiences that accompany increased uneasiness. Creating a comfortable environment and situations of success allows teachers to encourage students' intrinsic motivation and interests and reduce stress, especially during adaptation.

MAIN FOCUS IN THE CHAPTER

Issues, Controversies, Problems

Avatar-Based learning (A-BL) is a research-based instructional strategy that has been used for a long time in both special and general education classrooms. It is a teaching strategy that was used more in the past prior to the onset of Common Core Standards, but it is making a comeback because more and more students are exhibiting visual and tactile learning styles due to the enhancement of technology. Long gone are the days when teachers could stand in front of the class and "talk at" the students. Students today learn best when doing things with their hands—thus, the return of A-BL.

According to Larmer and Mergendolle (2010), there are seven essential elements that must be in place prior to A-BL occurring in any classroom. First, the project needs to have meaning to the student or students, and it must be a topic that interests them. This can be accomplished by showing the students a video on YouTube on a particular topic, or perhaps by suggesting that they investigate more in depth something they read about that piqued their interest or investigate an experience that they had while on a family vacation. Whatever interests the student should be used for the A-BL activity.

The next essential element Larmer and Mergendolle (2010) suggested is that the student, either on his or her own or with the assistance of a teacher, peer, or parents, devise an open-ended, challenging question. This question should capture the essence of the project and make the student think about what he or she is doing.

Providing the student with as much control as possible over his or her own project is the third essential element recommended by Larmer and Mergendolle (2010). Depending on students' academic and intellectual abilities, they may be able to have total control over their project, while others may need to have much more guidance from educators or other adults. It may be prudent to give students some control and see how they handle it, and then if they perform well, give them more control.

Fourth, skills learned from participating in a A-BL activity are essential not only in school but also in the workplace and in life in general. Larmer and Mergendolle (2010) noted that "collaboration, communication, critical thinking, and the use of technology" (p. 36) are essential elements to have within a A-BL activity. These are skills that these students will take with them once they leave the educational environment and that will assist them in becoming successful members of society.

Fifth, as students are working on their project, they should be encouraged to not only find out the answer to their main question (see the second essential element) but also come up with other questions that can either be answered by this project or by future ones. Larmer and Mergendolle (2010) suggested that students look for the answers to their questions in books, journals, or even on the Internet by posing the questions and following a trail, not just randomly looking for information.

The sixth essential element (Larmer & Mergendolle, 2010) recommended for a successful A-BL activity is to have the teacher provide meaningful, constructive feedback to the students so that they can reflect on it and decide how to move ahead with their project. Feedback should be more than a simple "great job" or "good work"; it should provide statements for the students to ponder or prompt further research. Feedback makes the project more meaningful to learners and shows them that their teacher values the time and effort they put into this project.

Seventh, Larmer and Mergendolle (2010) suggested that once the students have completed their A-BL activity, they present it to an audience. This could be done either with grade-level peers in a classroom, at an open house for the parents, or perhaps at an assembly for the entire school. Regardless of how it is done, it should be in a setting in which the student or students are comfortable, and how much of their project they present will depend on their ability level.

SOLUTIONS AND RECOMMENDATIONS

A-BL can be used at any grade level and in any content area because this research-based instructional strategy is very versatile. To engage students in avatar-based learning activities, teachers should observe three stages: stimulation and orientation, development, and self-conception.

Stage 1: Stimulation and Orientation

The first stage of the A-BL activity aims to create a positive attitude toward the activity and develop a strong interest in initiating the project. At this stage, the teacher could use surveys and interviews in order to learn students' cognitive preferences and show peers what type of A-BL activity other classmates are interested in pursuing. The decision of what project to choose is made either by the students themselves, if appropriate, or by the teacher, who can offer selective choices.

Once the student has decided which A-BL activity to work on (and if this is the first one they have worked on), the teacher can start with project tasks. A project task includes a number of assignments to stimulate children's group work intended to produce the outcomes or products similar to what they will be experiencing in a real A-BL activity. A project task is expected to be done as a group so that students get used to working in a collaborative environment. Generally, project tasks need two lessons or full class periods. Teachers can use the project task as an independent lesson or as a part of a lesson.

A good example of a project task in biology is called "The Mysteries of the Ocean." This task is based on the following skills and actions. First, the students are assigned to a small group based on their interests. Here, they collaboratively distribute assignments among participants, which teach mutual control while completing a task. Then, they look at a map and describe the lay of the land by looking for the same heights above the ground, using isolines or contour lines. By completing this project task, students demonstrate the ability to use their skills of depicting irregular terrain (isolines) in a new situation and use a new method to describe things they observe while working as a group.

Once the students understand the concept of the "The Mysteries of the Ocean," they will be asked to complete either on their own or in a small group another A-BL activity similar to the one they just completed. This activity is a project task in which the students create "The Animal World of the Great Ocean" map. To achieve this goal, students have to create a map of the ocean floor using the method of isolines (which they learned from the first project task) and combine that with asking questions, such as, "What types of animals live in the ocean? What do they look like?" The students will then conduct research by reading the text or conducting searches on the Internet. Students take on the roles of cartographers and oenologist's by placing animals on the map depending on their habitat.

To create "The Animal World of the Great Ocean" map, students can use descriptions of animals and their habitat, pictures of animals, and map fragments that mark the depth of the ocean at different points.

In order to complete this A-BL activity, teachers should follow these steps.

1. Study how cartographers depict the relief of the sea and ocean floor.
2. Use a layer wise (adding one layer at a time) painting to show the depth in the fragments of the Great Ocean.
3. Transform the map of "The Mysteries of the Ocean" into "The Animal World of the Great Ocean" map. To do so, attach pictures of animals to the places where they can live.

Once the students have completed these three steps, they should have a strong positive interest in A-BL activities, the average level of core competencies, and a basic understanding of A-BL principles, methods, stages, and tools.

Stage 2: Development

The main goal of Stage 2, or the development stage, is to promote students' readiness to participate in A-BL. Within one sample biology class, students did work in groups to complete their A-BL activities. However, all the work by the students did not necessarily take place only during class lessons. Some tasks were also completed within the framework of extracurricular activities or within any additional time the students had during the school day (e.g., lunch time).

In order to be successful within this stage, students should be able to demonstrate their proficiency in projects and their competency in planning the development and results of the processes and in solving practical problems. Students should also be competent in the use of research methods, equipment, and resources and be ready to do A-BL activities independently or within a small group of peers.

Stage 3: Self-Conception

Self-conception, or Stage 3, is the most difficult one, but it is important for students' development. Its main goals are to help students develop their own attitude toward project activities and realize A-BL's importance for further self-determination and realization. At this stage, teachers promote active learning.

In comparison with the other two stages, self-conception places more demands on the student, such as completing more tasks. Thus, the A-BL activity goes beyond the scope of learning and becomes part of students' everyday life (Belyanina, 2013). At the third stage of the A-BL activity, students develop several competencies. For example, students must have better skills, such as the ability to cooperate with peers, and learn how to make project plans based on the understanding of particular processes and objects. Students must also have self-determination and improvement skills and develop learning motives for themselves and their colleagues as well as treat each other morally. Finally, they must develop readiness to use the project-related competencies

in independent activities as well as obtain control skills and be able to reflect upon them. The project-based learning method is a teaching system that allows students with any type of disability to acquire knowledge and skills while planning and doing practical tasks. Depending on a student's abilities, A-BL should start out simple and then become gradually more difficult. Some students may need to accomplish one task on the project prior to moving on to the next task, while others may be able to handle completing more than one task at a time. Students individually or in groups can participate in learning, research, design, or other activities depending on what they prefer to study. Regardless of which way the educational project is completed, it gives students the chance to show their worth, use their abilities and expertise, and present the results in front of an audience, if applicable. Since A-BL activities can be accomplished within the context of educational practice, it is customary to discuss educational projects with the student as an effective way of developing the student's communicative and personal competencies. The discussion should be centered on how the project will solve a certain problem and achieve the planned outcomes in an optimal way. The project activities should solve an interesting problem formulated by the students themselves, and they should work out a solution that has a practical use and is significant and valuable to the participant or participants of the project. Once a A-BL activity has been found and the student agrees to do it, the teacher should find ways to motivate and encourage the student toward academic achievement and success. Encouragement and motivation can be expressed by any kind and type of aspiration or enthusiasm that will lead the student toward success. Through encouragement and motivation, the student will systematically develop the habits to achieve and promote knowledge and understanding that help achieve the desired goals the student is interested in and the ability to work with a vision of the future. The search for and the setting of goals that students regard as interesting and/or necessary form the basis of any A-BL activity when teaching children with intellectual disabilities. Teachers should look for goals in students' interests by seeking to answer the following questions: What does the student speak about? What does he or she focus on? Where does he or she give a powerful response? These and related questions help work out an idea for the goal. Having a goal will increase the efficiency of the A-BL activity when used with children with intellectual disabilities. It will assist with social adaptation, individual maturation, and teaching. In order to establish goals for a A-BL activity, the following rules should be followed:

- Use the present tense.
- Avoid "not" and "no" (use positive expressions).
- Define the framework of its implementation (requirements, terms).
- Set subgoals.

- Specify everything needed to achieve the goal by a specific date. Items such as additional materials, time, knowledge, skills, friends, and money should all be included.
- Have the student set measurable, realistic goals related to the A-BL activity.
- Encourage children's emotions, vigor, wishes, aspirations, and enthusiasm by having them think about their goals and achievement.

Ultimately, the extent to which the teacher participates in the project depends on students' readiness and research competencies. Initially, teachers, parents, and peers may provide considerable assistance depending on the students' abilities. However, once the students acquire project-related skills and research competencies, the assistance should be occasional and dependent on specific problems. In addition, students should have an option to choose the type of assistance they require—whether from a teacher, a parent, or another student participating in projects. Prior to starting a A-BL activity in a biology class with students who have an intellectual disability, the teacher should demonstrate the main goals of biology. In order to accomplish this, the teacher should do the following:

- Provide students with information about the basic elements of inanimate nature (e.g., air, water, minerals, and soil) and wildlife (e.g., structure and life of plants and animals, and the human body and its health).
- Develop the appropriate understanding of natural phenomena in the life of plants and animals.
- Show appreciation for and develop a positive attitude toward nature throughout the course of ecological education (e.g., study the surrounding nature as a set of conditions required for the life of plants, mushrooms, animals, and people).
- Demonstrate ways of cultivating some plants (e.g., houseplants and plants within school grounds).
- Develop and promote students' human health skills.

It should be noted here that teachers should feel free to add more biological content to this list as they deem appropriate for their students.

Biology teaching aims not only to help students learn curricular material but also to overcome students' intellectual and physical disabilities. When they learn facts about wildlife and inanimate nature, students develop skills of observation, speech, and thinking. They learn to see elementary cause-and-effect relations, the interdependence of living organisms and their dependence on inanimate nature, the interrelations between people and inanimate nature, and their influence on it.

Due to its integrated nature, problem-solving orientation, and preference for group work, the A-BL method is capable of solving difficult and pressing teaching

problems. If children interact during biology lessons doing project activities, it allows the teacher to develop the core competencies of children with disabilities. Students learn how to keep fit, to be law-abiding citizens, to look for information and learn new things, to interact with the social sphere, to cooperate and communicate, and to work. The A-BL method also encourages students to work more independently, to develop their abilities, to show leader qualities, and to assume personal responsibility for their own skills and for their use in real-life activities.

A major approach to starting project-based learning activities with students with disabilities in a biology class is through trainings. For example, A-BL activities can be learned through games, which is a widespread form of active learning used to put knowledge into practice and acquire important skills. Game structure includes role-playing, learning, leisure, actions, the use of resources, relations between participants, and a plot (e.g., various life situations) and can occur either inside or outside. The training aims to nurture new skills, to develop behavior patterns, and to help students get initial positive experiences. This is a perfect way to realize creative potential and overcome psychological problems. It is advisable to use competitions to promote participants' tenacity, fast adaptation, and group cohesion.

In practical terms, trainings have important functions, such as the following:

- Entertainment—inspires, arouses interest, introduces variety, and allows students to relax (various games that can trigger participants' emotional responses include "The Call of the Jungle" or "The Hour of Triumph").
- Communication—develops communication skills and the ability to establish and maintain good relationships (e.g., work on the common project, team games, drama games).
- Troubleshooting—reveals behavior deviations (e.g., case studies, dialogues, etc.).
- Self-discovery—teaches students to overcome difficulties in real-life situations (e.g., the student participates in group projects as a member of different groups and takes on the roles he or she usually avoids, such as a leader, an assistant, a proofreader, a project developer, etc.).
- Work out—improves participants' knowledge and skills and adjusts their individual characteristics.
- Socialization—helps adapt to various situations.

A-BL activities can occur in many different forms and will depend on the student's individual academic abilities. Below are a few examples to get the teacher started. Additional activities can be found in *Engaging Children's Minds: The Project Approach* (Katz & Chard, 2000) and *Creating and Assessing Performance Based*

Curriculum Projects: A Teacher's Guide to Project-Based Learning and Performance Assessment (Banks, 1997).

Visualization is very important for students with intellectual disabilities; therefore, biology teachers should use eidetic and printed charts when teaching the most difficult topics. Students should be encouraged to draw and make posters and charts and to do their best when drawing, carving, and putting objects on paper. This allows students to realize that they participate in learning.

Pictogram and Ideogram Writing

Another interesting project-based method activity employed during biology lessons is *pictogram and ideogram writing*. This special graphic teaching method uses special signs and symbols comprised of graphic elements. *Pictograms* are disconnected and fragmented drawings of fundamental objects and ideas such as man, woman, fire, food, tree, and shelter. These are combined to form stories, songs, and epics. There is no connection between the spoken word and the object pictured; instead, a pictogram recalls the object or concept itself, not its name. Graphic symbols should reflect only the basic points of curricular material—the key ideas and concepts. *Ideograms* are simplified pictures used in a system of writing to represent a concept or idea. For example, a number of tree symbols are unified to make a forest, or the symbol for man, woman, and child are consolidated into a single family symbol. The name of the object (or its action) is closely identified with the picture.

The most important requirement leading to the successful perception of pictograms and ideograms is the simultaneous activity of auditory and visual perception. Since drawings are used to show something and words are used to say something, this source of visual information is reflected in the brain simultaneously, whereas auditory perception is sequential and is perceived as non-simultaneous. This mechanism puts forward the main requirement pictograms and ideograms have to meet in order to be used in learning—they should be synchronized with the teacher's explanation.

Pictogram writing consists of associative symbols that replace a certain meaning. It helps instantly to recollect familiar facts students already understand. It is advisable to introduce pictograms and ideograms during a discussion, for instance, when students are characterizing a group of living organisms. Pictograms and ideograms should be easy and quick to draw without any special drawing skills, whether shown on the whiteboard or shown as PowerPoint slides.

At the same time, they should be informative. It is important to ensure that some pictograms and ideograms can be used to describe several groups of organisms or a variety of biological processes and can be changed to reflect the specific features of a certain group or process. For example, during the lesson summarizing Arthropods, the teacher reads out loud, "The spider has eight legs, the May bug has six legs, and

the crawfish has ten legs." This represents three classes at once (e.g., the arachnid, the insect, and the crustacean). The teacher and the students could draw three circles and attach eight lines to the first circle to represent the spider; the second circle would have six lines to represent the May bug, and the last circle would have 10 lines to represent the crawfish. Students can memorize the simple pictograms and ideograms by drawing them in their notebook, and the teacher can make a chart that could be posted in the classroom for later reference.

The effect of pictogram and ideogram writing is associated with the fact that students can easily memorize the teacher's signals and then use visual images as a plan for their notes and a source of certain information. Using pictogram and ideogram writing, students with intellectual disabilities learn successfully and can even retell the facts learned during a lesson. Pupils who find it difficult to give an answer (orally or in writing) can do tasks that involve schematic drawings and develop the skill to reveal how organisms adapt to life in a certain habitat: for example, "Draw things that help fish (bugs, people) breathe" or "Draw a fantastic animal that is better adapted to living in water (on land, etc.)." Tasks like these make students more engaged in the lesson. Children do not consider these tasks difficult and regard them as a game.

The demonstration of basic facts through a number of drawings gives students the chance to orient themselves easily, increases the students' ability to grasp curricular material information, and provides assessment data for the teacher. Pictogram and ideogram writing is usually used during lessons that summarize certain key points—for example, groups of animals.

Learner's Notes

Once students have learned the concept of pictograms and ideograms and have practiced using them, they should be encouraged to take their own notes, or *learner's notes*. It is essential to focus on learner's notes for students with intellectual disabilities. Some students find it very difficult to memorize certain terms and formulas, let alone remember large chunks of material on a topic; thus, they often get confused, become unsociable, and finally lose interest in the subject completely. However, with the use of learner's notes, the students feel supported. Learner's notes allow them to remember and reproduce not only separate items but also entire topics without the teacher's assistance.

Gradually, students get less constrained and become interested in learning. Even such a small success as a satisfactory answer and a good mark improves students' self-assessment, strengthens belief in their abilities, and encourages motivation.

Essentially, the students can develop their learner's notes as they wish; however, a few guidelines may assist with this process. For example, students should be

encouraged to use color to highlight important concepts like vocabulary words. After the students draw the pictogram, they could also write the word in a specific color so that they have both learning methods to remember the word. Students can also use a graphic organizer, such as a T chart or a Venn diagram, to compare animals or plants. Pictograms of the animal or plant can be placed on one part of the diagram, and the description of it written in color can be placed on another part. Finally, the use of flashcards may be beneficial to the student. On one side of the card, the concept or vocabulary word the student needs to learn is written via a pictogram, and on the other the definition is written in color or highlighted. When any student, disabled or nondisabled, is not engaged in a lesson due to the information being presented in a way that does not pique the student's interest, he or she is not motivated to learn. In order to change this, Trybus (2014) suggested that game-based projects be used in the classroom to stimulate the student's interest in the leaning process and to use this information in real-life situations via a game. Huizenga, ten Dam, Voogt, and Admiraal (2017) supported Trybus's claims by suggesting that game-based projects encourage mental processes most effectively.

To use game-based projects in the classroom, teachers should develop tasks that intellectually disabled students can carry out efficiently even at the end of the lesson when their learning capabilities are lowered. Although these tasks are a form of learning, students regard these tasks as games and do them eagerly.

To encourage biology learning, it is possible to use various didactic games (printable, electronic, network games, etc.), but teachers may get a better effect if they develop games independently so that they fit within the framework of the project. It can be an individual project such as a crossword puzzle, a quiz game, or a rebus related to curricular materials. It could also be a group project, like "Mysteries of the Green World," which is described below.

Mysteries of the Green World

This quiz game familiarizes students with various plants and expands their ideas about the surrounding world. While they are answering questions, pupils familiarize themselves with wild plants and places where they grow; learn about indoor and garden flowers; gain knowledge about fruits and propagules, flower parts, and inflorescences; and study the structure of plant cells and poisonous plants. With the assistance of the teacher, students should be encouraged to develop the questions and illustrated cards for the game by themselves.

To gather information to place on the cards for the game, students should read not only their textbooks but also additional literature and should also explore resources like the Internet. They should be encouraged to select the most interesting materials,

then write questions and the answers, and prepare illustrated materials. This is a fantastic opportunity for students' teamwork and collaboration development.

FUTURE RESEARCH

It is essential to develop methods to promote independent learning in students with intellectual disabilities within the general education classroom. The research should aim to substantiate and develop methods to promote independent learning in students with intellectual disabilities:

- Analyze psych educational literature related to the problem under study.
- Study current problems associated with the promotion of independent learning in special schools.
- Determine the most efficient methods and techniques intended to promote independent learning in students with intellectual disabilities and work out teaching strategies to promote independent learning during everyday lessons.

CONCLUSION

Teaching methods for children with intellectual disabilities are based on an individual approach to the child. The goal of the individual approach is to teach students to achieve success in their studies depending on their capabilities.

This article focused on how to use the avatar-based learning method to teach children with intellectual disabilities within the framework of inclusive education, using biology as an example subject area. Years of educational practice demonstrate the efficiency of project-based learning research activities. The avatar-based learning method promotes development of effective socialization and communication skills and improves intrinsic motivation and cognitive interest. Using avatars, teachers can help build students' self-awareness, self-determination, and self-affirmation.

The key takeaways on the avatar-based learning method discussed in this article are the following:

- Students with intellectual disabilities and normally developing children consciously accept each other in the AVATAR-BASED LEARNING environment, thereby harmonizing children's relationships with students with different intellectual and physical developments. The students come to understand the importance of a healthy way of life and fundamental facts

about individual and surrounding people's (peers' and adults') life safety in a game environment, which is close to a real-life situation.

- Fundamentals of communication skills and other special abilities should be encouraged with regard to specific features of the AVATAR-BASED LEARNING activities and tailored toward the specific features of students with intellectual disabilities.
- Intellectual, emotional, volitional, and other personal qualities (goodwill, sympathy, initiative, adequate self-assessment, etc.) appropriate for school students in the course of interaction in a multifunctional interactive environment should be encouraged.
- Basic learning skills should be specified and enhanced during project activities.
- Real-life activities and work on projects help children to develop fundamental abilities to be tolerant of others' opinions, develop teamwork skills related to practical/game/labor/learning activities, and develop other skills, abilities, and knowledge that have universal social value.
- This method enhances abilities and skills to use various communication media, including interactive types.

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KEY TERMS AND DEFINITIONS

Avatar-Based Learning: An instructional method that actively involves learners in investigating real-world issues and answering related questions.

Avatar Task: An assignment designed to stimulate children's group work and intended to produce the outcomes or products similar to what they will be experiencing in a real activity. Allows students are to get used to working in a collaborative environment.

Concrete Thinking: Focuses on facts, literal definitions, and physical objects; the opposite of abstract thinking.

Ideogram: Simplified pictures used in a system of writing to represent a concept or idea.

Inclusive Education: Educating students with special educational needs in the general education classroom.

Intellectual Disability: Intellectual functioning that is significantly below average and adversely affects a student's educational performance and achievement.

Learner's Notes: A note taking method that allows students to record information in the way that works best for them, such as drawing pictures instead of writing words.

Pictogram: Disconnected and fragmented drawings of fundamental objects and ideas such as man, woman, fire, food, tree, and shelter that are combined to form stories, songs, and epics.

Chapter 11
Integrating Blockchain Platforms With Big Data Solutions for Regional Innovation Development

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ABSTRACT

The chapter discusses the creation of a mechanism for ensuring reliable and secure interaction among participants in regional innovation systems based on the establishment of smart contracts in the blockchain. The technology allows to reduce the possibility of fraud by dishonest participants, as well as to exclude the need for a third party by transferring its functions to a smart contract. This is important for ensuring confidential and transparent relations between participants in innovative projects, as well as with interested subjects of social and economic activities in the regions. The Ethereum blockchain platform was chosen to create smart contracts. On its basis, there were developed components to perform transactions in contracting, creating, and implementing innovations, transferring intellectual property rights, using rights and licenses for innovation, etc. The main component of the system is a distributed transaction register with digital copies of innovation objects.

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INTRODUCTION

Today we can observe the strengthening of global communication accessibility that promotes the emergence of new economic relations on the principles of collaborative behavior.

The authors in previous research identified that the main barrier impeding efficient interaction of innovation actors in Russian Federation (RF) is high level of transaction costs. As a rule, there are growing instability and uncertainty of existing links and relationships at innovation activity stages, which, in particular, stimulate the growth of transaction costs. This determines high costs of development and implementation of innovations. Such costs are not of transformational nature associated with transformations and changes of initial resources, but of transactional one that is determined by a necessity of collaborations and mutually beneficial contacts.

The strengthening of interactions between interested participants in a regional system appears to be an important mechanism of innovation activity development from the emergence of an idea to the commercialization of innovation.

It is reasonable to use digital technologies to organize and support an innovation system that simplify and promote interactions between innovation activity participants by performing a situational analysis of large volumes of structured and unstructured data on innovation activity subjects in the regions.

The cyber-social innovation system may be considered as an intelligent information system focused on lowering the barriers to implementation of innovations by engaging a larger amount of participants in the innovation process and ensuring their intensive interaction. Its synthesis requires a mechanism that will enable different agents of innovation interaction having common development goals to create new knowledge and exchange it in a safe intelligent network.

The Internet of Things (IoT), Big Data and blockchain are three main trends that could combine to create an entirely new methods and tools for managing regional innovation system and provide their economic development. Blockchain technology provides the ability to redistribute costs across all of the participants of the peer-to-peer network, and give each peer an economic motivation to provide their (small) part of the infrastructure needed to enable the greater good. This reduces the burden on any individual peer, while allowing them to leverage the resources of all (Sun, et al., 2015).

The aim of the present chapter is to substantiate the essence, peculiarities and features of integrating blockchain platforms with Big Data intelligent analytics for regional innovation development. The study was carried out based on materials describing the development of this concept both in the whole world and its spread in the Russian economy.

BACKGROUND

The world experience in transition to the digital economy is disclosed in the works by Tapscott D. (1996), Brynjolfsson E. & Kahin B. (Eds.) (2003), Wetherbe J.C., Turban E., Leidner D.E. & McLean E.R. (2008).

Digital economy operates at three levels - markets and industries, platforms and technologies, environment (Bershadsky, et al, 2017). At the first level, suppliers and consumers interact, at the second level; competencies are formed for the development of markets and sectors of the economy. The third level is the environment that creates conditions for the development of platforms and technologies. Technological tools and management models are necessary for its successful operation and development. They will participate in all three levels, create "cross-cutting" technologies to operate in the global market and develop infrastructure for the digital economy (Mkrttchian, et al, 2016).

Many researches today are devoted to the investigation of the technologies and processes concerned with Industry 4.0 and its impact on economic development. Industry 4.0 supposes the use of network approach that is based on the ability of creating smart products and components (Kohlberg & Zühlke, 2015). According to the authors (Kohlberg & Zühlke, 2015) Industry 4.0 enables new implementation areas through the potential of Industry 4.0 technologies such as powerful, flexible and affordable Cyber Physical Systems' applications with various production types.

The Internet of Things (IoT), Big Data and blockchain are three main trends that could combine to create an entirely new methods and tools for managing regional innovation system and provide their economic development. This development looks at the 'art of the possible' and this new way of thinking could provide powerful ways for a business to run autonomously (Sun, et al., 2015).

Blockchain technology provides an alternative that allows any single participant to essentially "outsource" the management, communications and scalable infrastructure problems to the peer-to-peer network that maintains the blockchain. Instead of using a central server, a distributed public ledger will be maintained to store the transaction records of "things" and every node will possess a copy of this immutable public ledger. The "scalability" feature of blockchain can be utilized to accommodate 'things' in the IoT world (Sun, et al., 2015).

Blockchain is a specifically structured uninterrupted sequential chain of blocks (chained list, distributed register) containing information on participants and existing innovations (Swan, 2015). Copies of blockchains are stored and processed independently from each other in multiple network nodes (Franco, 2014; Antonopoulos, 2014). Originally the term referred to the completely replicated distributed data base (register) designed for the "Bitcoin" system, as the technology was initially intended for cryptocurrency transactions. Although blockchain can be

applied to any interconnected information objects. Blockchain is actually a chain of blocks connected sequentially. In blockchains, the chronologically ordered data points are grouped into individual storage units called blocks. These blocks are then ordered sequentially and stored in a decentralized manner across all the participating nodes to form the blockchain (Asharaf and Adarsh, 2017).

Bughin and Manyika (2015) assumed that the crucial impact factor in competition is related with the Internet of Things (IoT) which means that senior managers and company's members must act at the system level in order to be able to solve the challenges coming from the technological disruption.

Big data and big data analytics have become the important frontier for innovation, research and development (Chen and Zhang, 2014; Laney and Jain, 2017). Big data and its emerging technologies including big data analytics have been not only making big changes in the way the business operate but also making traditional data analytics and business analytics bring forth new big opportunities for academia and enterprises (Sun, et al., 2016, Sun, et al., 2014; McAfee and Brynjolfsson, 2012).

An intelligent big data analytics becomes the disruptive technology for the age of trinity in terms of healthcare, web services, service computing, cloud computing and social networking computing (Laney and Jain, 2017).

MAIN FOCUS OF THE CHAPTER

The ubiquitous development and implementation of blockchain technology will fundamentally change the way the economy functions today and how economic transactions are carried out.

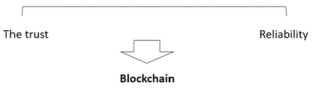
The blockchain technology was developed in order to create a decentralized model for data exchange and storage, which is controlled using a decentralized operating system. Decentralized systems cannot be controlled by a minority of participants or a single body exercising centralized management, and they are transparent to all participants, as well as self-governing.

Blockchain has strong advantages for systems where it is necessary:

The Trust: Any process where the intermediary provides a trusting relationship between the producer and the consumer (information, product or something else).

Reliability: Blockchain was created as an impenetrable fortress to protect value, especially digital assets (Figure 1).

Figure 1. Main features of blockchain



The Use of Big Data Analytics in Regional Economic Development

Big data analysis and analytics help user organizations get value in the form of more numerous and accurate business insights. Similarly, universities can get value with Big Data analytics, - one gets a host of new possibilities ranging from new ways of providing students with basic support to new ways of getting students to learn what the faculty needs them to learn. Furthermore, the rapid advancement of big data analytics make it necessary for any university to coincide it with their management and measurement.

Big data analytics can be defined as the process of collecting, organizing and analyzing big data to discover, visualize and display patterns, knowledge, and intelligence within the big data (Sun, et al., 2015). Similarly, big data analytics can be defined as techniques used to analyze, acquire and visualize knowledge and intelligence from big data (Gandomi and Haider, 2015). The main components of big data analytics include big data descriptive analytics, big data predictive analytics and big data prescriptive analytics (Sun, Zou, & Strang, 2015; Gandomi & Haider, 2015).

Big data analytics can facilitate business decisions and business goals by analyzing existing data and future trends, creating predictive models for predicting future threats and opportunities, and streamlining business processes to improve the performance of an organization using the methods mentioned (Delena and Demirkanb, 2013; Chen, et al., 2012).

The Big Data is usually characterized by five properties:

1. **Volume:** Typically, Big Data refers to massive volumes of data, usually in zettabytes (ZB) or more.
2. **Variety:** The data consists of a mixture of structured, unstructured and semistructured information, drawn from such vastly heterogeneous sources as RFID (radio frequency identification), web searches, social media, mobile sensors like GPS and accelerometers, high fidelity industrial sensors, video streaming etc.

3. **Velocity:** Big Data arrives at varying speeds ranging from milliseconds to days to years, and has differing requirements on the speed with which it is to be processed.
4. **Value:** Some researchers consider value as a key characteristic of Big Data, with data being considered valuable if useful information (from a business or engineering perspective) can be extracted from large data sets where individual data points may not carry any value by themselves.
5. **Veracity:** This refers to the accuracy and trustworthiness of the data. This becomes increasingly relevant when large numbers of users in the IoT may be reluctant to report truthful data due to privacy and security concerns (Saravanan, et al., 2019).

The rapid growth of the IoT technologies and the creation of large-scale cyber-physical systems human networks has made Big Data tools crucial to every IoT application. Data generated from devices was already big even before the arrival of IoT. Now, this data is projected to double every two years to reach an estimated 35 ZB (zettabytes) with more than 50 billion estimated devices by the year 2020.

However, Big Data technologies must surmount several key barriers including standards, security and privacy, efficient storage and analysis and network infrastructure.

Basic requirements for implementation of Big Data:

1. **Requirements for Modern Platforms for Collection and Processing of Data:** In the IoT paradigm, data is acquired from various resources such as internet, social media, mobile sensors, RFID etc. The platform for Big Data have the technology to work with data alone (structured and unstructured), and with data in motion (powerful data streams from any type of source). Stream processing needed: overcoming the curse of dimension in data storage.
2. **Platform Must be Trained by Real Time System: the Goal of Training IT systems is Undoubtedly the Improvement of their Characteristics on two Basic Factors Influencing the Quality of the Solution:** IT awareness and intelligence. Any ideas for teaching people or systems are based on applying knowledge accumulated in the past to make decisions in the present or predict the future, on the idea of feedback from the past to the present. The processed data is mined using learning techniques to extract useful information, which can then be visualized and used for predictive analysis.
3. **Data Management:** Several powerful Big Data technologies like MapReduce and NoSQL used to retrieve data effectively from heterogeneous sources and process it according to application needs.

4. Free adaptive search and production of information: the legitimate ways of extracting information are technologically implemented through the toolkit of search platforms that provide teams of analysts (IT and business) with the possibility of free creative search in all cyberspace. Modern platforms implement the concept of free search across cyberspace under the control of a creative team, with feedback on this team.

Blockchain and Smart Contracts for Interaction Of Economic Actors

It should be noted that elements of any cyber-social system depend on the provided safe and reliable interaction within transaction processes aimed at elaboration and implementation of development mechanisms, including the innovation ones. The trending transition to digital economy means that the most processes of informational interaction should be carried out with minimal human involvement. At the same time an important role in digital economy is assigned to safety and transparency of transactions between interacting agents that should be provided by blockchain and smart contracts.

As we know, purchasing, selling and renting various products and services on the Internet and by online commerce is a complicated task. The main problem is trust relationships or a lack thereof between unacquainted transaction participants. To solve this problem it is required to address the third party for guarantees of transaction settlement. But even in this case the problem of safety is not resolved by high reliability. In risk management the technology of the distributed register (blockchain) is being applied more actively, as it reduces the probability of fraud from dishonest participants and excludes the need for the third party by transferring its functions to the intelligent system.

All data are stored in network nodes of users of the distributed register system. Each node stores a part of information in the form of data blocks or copies of such blocks. This principle makes the system virtually invincible to information threats and attacks, all the more these blocks are protected by cryptographic keys and calculated using the algorithm of hash-functions.

An example of blockchain application in intellectual property rights management in Russia is the implementation of IPChain on HyperLedger Fabric allowing to work with different information channels within a single register and determining the transaction approval policy for each of them. Hyperledger Fabric is a project of the consortium led by IBM embracing top IT companies, such as Intel, Oracle, Cisco, Digital Assets, etc. The main advantage is an adaptive algorithm designed to achieve concord between trusted nodes by means of a mechanism that performs decentralized registration of transactions in a set number of equal nodes and, in case

the authenticity of results is proved, confirms a transaction. The infrastructure of IPChain includes a bound register of intellectual property objects and a transaction register with the said objects, transaction registry nodes, transaction fixing nodes, network administration nodes and trust certificate issuing nodes.

In 1994 N. Szabo (Szabo, 1997) proposed the concept of smart contracts, which became possible to realize only in 2008, when blockchain occurred. A smart contract is a special protocol intended to contribute, verify or implement the negotiation or performance of the contract by means of blockchain. This type of contracts fits any transactions. It guarantees money transfer or execution of other actions as soon as all parties have completed contract obligations. When parties conclude a smart contract, it is similar to transferring of cryptocurrency blockchain funds. After that the contract comes into effect. In order to have contract's obligations automatically complied with there is required a special environment enabling automatic execution of all contract's clauses. Thus, a smart contract can exist only within such environment, where the program code executing the contract's algorithm has access to its objects. Therefore, all relationships between parties within the contract should be mathematically formalized and feature a clean execution logic. According to transaction conditions, the smart contract's algorithm tracks accomplishments or breaches of its clauses and makes a corresponding decision automatically to ensure authenticity of contract obligations.

The objects of smart contracts may be the following:

- Interacting parties accepting or declining contract's conditions via digital signatures,
- Contract's subjects including objects in the field of contract's existence,
- Conditions that display a logic of contract clause execution in the form of a formalized mathematical description, which can be programmed in the field of contract's existence.

In turn, the existence of smart contracts requires as follows:

- Application of digital signatures on the basis of public and private keys through asymmetric encryption.
- Presence of open distributed data bases for storing of data on executable transactions with access for contracting parties.
- Availability of a distributed network to execute Ethereum, Codius, Counterparty contracts, etc.
- Digital data source validation, for example, by means of SSL certification centers.

Today modern blockchain platforms are used to develop decentralized applications (DApps). Although decentralized applications are similar to smart contracts, they have no direct connection with funds and enable to utilize blockchain for any means. DApps have no limitations in the number of participants and they are independent from market segments.

SOLUTIONS AND RECOMMENDATIONS

To create a blockchain system of interactions between regional innovation system subjects it is necessary to choose a platform and to develop a series of components on its basis that execute various transactions. The system must provide safe and reliable conclusion of contracts and accomplishment of contract obligations when developing and implementing innovations, as well as transfer of intellectual property rights, carrying out the stipulations of license agreements, transparency, protection and conservation of data on innovations and innovation companies, opportunities for rights and licenses usage monitoring in the course of innovation activities, etc.

CONCLUSION

The chapter considers questions of creation of a new mechanism providing reliable and safe interaction of regional innovation system's participants on the basis of smart contracts created in blockchain.

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Chapter 12
The Fundamentals of Creating an Avatar-Based Expert for Decision Making in the Digital Era

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ABSTRACT

The chapter considers political communication organization in terms of its structural and informational aspects. The specifics of classic and online political communication are described through the theory of factors of speech communication regulation. The detailed coverage of speech regulation factors enables the author to describe classic and online political discourse. The analysis reveals some similarities along with differences between the two above said types of political communication. Some of the author's statements are exemplified with excerpts from political texts. The research was carried out on the material of American political discourse referring mostly to conflict situations and use of the same ideas for communications about Avatars Technology by Prof. Vardan Mkrttchian.

INTRODUCTION

As resulted from the 20th century globalization and transition to post-information society, production and spread of information are becoming dominant among the current social processes. Along with this, politics has become an integral part of everyday reality. Development of media, gadgets and the Internet has facilitated the

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way for political message from the addresser to the addressee and has enabled it to instantly reach the audience either target or non-target. Politics determines and forms attitudes, values and ideas.

Post-globalization period is characterized by numerous conflicts in different parts of the world. Generally speaking, political conflict may be regarded as a complex phenomenon and as a feature common to any political system. Political conflict may be defined as counteracting of parties (political subjects) that is expressed in certain actions directed against each other. The actions may be different in nature. Speech actions in a political conflict situation present interest for the researcher in terms of investigation of political communication in general, and political conflict communication in particular. The stage of conflict escalation is especially indicative of verbal means and argumentation strategies used for political purposes of affecting mass consciousness. Used for political purposes, the language has become means of domination and enforcement. The term 'Words of Mass Destruction' (WMD) was coined in the media to denote emotionally charged vocabulary used in conflict communication. 'The Guardian' foreign columnist Simon Tisdall used the term WMD to illustrate the language used to describe the military conflict in Iraq. The word 'crusade' widely used in political rhetoric after September 11, 2001 served as an allusion to the medieval crusades of Richard the Lionheart thus being provoking for the Muslim world. S. Tisdall explains his idea: "The urge to suppress arguably loaded words should as a rule be resisted as inimical to free expression and better understanding. As every spin doctor knows, acceptance of "official" terminology can amount to implicit endorsement of official policy. But the search for the right word requires constant awareness of ambiguity and politically and culturally charged, multiple meanings… Before passing the ammunition, pass the word" (Tisdall, 20113).

Language may be regarded as a mighty tool of political conflict. Therefore, the study of political communication, particularly in a situation of political conflict, seems of high priority under the present circumstances of overall widespread of information and opposition in the course of information wars. Of primary interest for a researcher is the functional and communication sphere of politics as a whole and of a political conflict in particular. According to T. van Dijk, reproduction of political information corresponds to reproduction of political discourse as stipulated by the ties between political actions and political processes on one side, and communication and discourse, on the other. Critical discourse analysis postulates the power being connected with control, and control over discourse means the way to its production, therefore, to its contents, style and finally, to mass consciousness (van Dijk, 2013). Another link not to be omitted in this respect is the interrelation between language and culture. Language may be regarded both as part of culture affecting its products and the instrument for creating these products (Blokh, 2013b).

Taking the above into account, we chose to turn to the study of the 20th century American political communication in situations of global conflicts. Therewith, we consider the online political communication with the view of describing the specificity of both communication types.

BACKGROUND

In post-Soviet Russia the relationship of language and Soviet politics came under study in the 1990-s. The issue became the subject both of linguistic and of interdisciplinary research by V. G. Kostomarov (Kostomarov, 1994), I.A. Kupina (Kupina, 1995), T.M. Nikolaeva (Nikolaeva, 1998). The interest for political communication problems marks the fundamental works by E.I. Sheigal (Sheigal, 2000), I.V. Wolfson (Wolfson, 2003), A.P. Chudinov (Chudinov, 2007).

Western researchers considered the issues of language and ideology prior to Soviet (Russian) ones due to substantial restrictions on Soviet scholarship. The first works on political communication describe the propaganda techniques (Lippman, 1920; Lasswell, 1927; Lazarsfeld, 1940; Klemperer, 1968). The issues of language in a state are tackled in the works by N. Chomsky (Chomsky, 1988), A. Besancon (Besancon, 1998), L. Hahn (Hahn, 1998), L. Grenoble (Grenoble, 2003), J. Duhn (Duhn, 1995). Political discourse analysis is considered in the works by N. Fairclough (Fairclough, 2003), P. Chilton (Chilton, 2004). The above researchers investigated the problems of language and language influence on mass consciousness, the phenomenon of speech manipulation in political rhetoric.

Speech manipulations in political communication were specifically studied by A. N. Baranov (Baranov, 1986), R. Blakard (Blakard, 1987), D. Bolinger (Bolinger, 1987), V. Karasik (1992, 2002), E.I. Sheigal (2000), G.G. Pocheptsov (2000), V.E. Chernyavskaya (Chernyavskaya, 2005).

Three main directions in researching political communication abroad were generalized and described by E.V. Budaev and A.P. Chudinov (E.V. Budaev and A.P. Chudinov, 2008). Rhetorical direction represented by R.D. Anderson, R. Carpenter, V. Rikkert, M. Osborn, S. Tompson applies traditional methods of political communication analysis. Cognitive direction scholars (G. Lakoff, M. Johnson, P. Drulak) base their research on the cognitive approach according to which speech activity is perceived as the reflection of the worldview existing in human consciousness. The third, discursive direction is based on the discursive approach giving special attention to the situation in which the text was created and is functioning. Highlighted is the correlation between the text and the social and political conditions and cultural background of the speaker and his/ her national traditions. Within this direction, critical discourse analysis as represented by T. van

Dijk, N. Fairclough, Z. Ager, W. Maas, R. Wodak considers communication as a form of social practice and is aimed at studying the interaction between the language and social phenomena.

The research we are currently undertaking is based on the dictemic theory of the text and its information structure put forward by M. Y. Blokh (Blokh, 2000). Along with this, we refer to the theory of factors of speech communication regulation (Blokh, 2013) in a given situation of speech communication. Thus, discursive aspects of political communication analysis are of special interest to us. We regard political conflict as determined by the specific conditions under which it develops – a situation defined as a complex of circumstances under which the counteraction of the conflicting parties is unfolding. The specifics of the research necessitate the definition of political discourse as central to communication analysis. Following the idea of discourse being a more general concept than text (Blokh 2013a), we define political discourse as a text determined by the theme of expression and asserting interests of political subjects considered in a situation of political communication. Political discourse incorporates a wide range of genres of political communication, both in classic and online forms.

From the point of text and discourse structural and pragmatic formation, a key term we employ is the dicteme (Blokh 2000). Dicteme is defined as a basic unit of language and a unit of text thematization which provides for the sequence of speech. The dicteme realizes four principal functions of speech: nomination, predication, thematization and stylization. According to M. Y. Blokh whose theory we follow in our research, speech acts are realized in dictemes of the text (Blokh 2013b). This view contradicts the theory of speech acts developed by J. Austin who stated that speech acts are realized in assertions (sentences). Dictemes-informemes as minimums of discourse (text) serve to actualize the speech acts. Accordingly, communication may be described as exchange of dictemes.

In our view, dictemes as correlating with speech acts (both illocutionary and perlocutionary) may be nominated according to the types of speech acts. For example, a text of conflict situation may consist of dictemes-accusations, dictemes-reproaches, dictemes-verdicts and the like. Nomination corresponds to different types of agonality/aggression speech acts.

The unfolding dicteme corresponds to the exposition of the information aspect of the text. The dicteme information complex realized in the course of the speech act comprises several types of information rubrics reflecting important features of cognition and communication. The first rubric is communication and guideline information defining the type of cooperation between the speaker and the listener in terms of speech and activity; the second rubric includes factual information of general type reflecting the situation. The third rubric features factual information of special type conveying ethnic, social and cultural, terminological realities. The fourth

rubric comprises intellectual information reflecting the movement of the cognizing thought of the speaker. The fifth rubric comprises the emotive information connected with emotional expression. The sixth rubric consists of structural information that conveys the structural properties of the text that typologically mark it. The seventh rubric is register information reflecting differences between neutral, literary and colloquial variations of speech. The eighth rubric comprises social and style information corresponding to the text functional style. The ninth rubric features dialect information reflecting territorial and ethnic properties of the text. The tenth rubric is impressive information implementing the connotation of target influence on the listener. The eleventh rubric contains esthetic information that builds the aspect of artistic way of expression. Each of these rubrics is linked to the special content type of dicteme. The generalized classification offers four main types of dicteme information: factual, intellectual, emotive and expressive.

MAIN FOCUS OF THE CHAPTER

Turning to the theory of factors of speech communication regulation, we can observe the correspondence between those and the structure of a conflict situation (Aleshina, 2014). We follow the classic concept of conflict structure offered by M. Weber. According to him, the conflict structure as an ideal static phenomenon includes the following elements: two or more conflict sides (subjects of conflict, conflicting parties); the object of conflict; indirect conflict sides (organizers of conflict, provokers); third side (mediators, referees); social environment (Kozyrev, 2008).

M. Y. Blokh offers seven factors of regulation of speech communication (Blokh, 2013b). The first factor is the target content of speech (utterance), defining what is being said and what it is being said for. These two points build the communicative frame of the meaning of the utterance. The second factor is the personal status of the speaker which includes characteristics contributing to the formation of the speaker's linguistic identity. Personal characteristics include temperament, ethos, moral qualities, level of education, occupation, social status, intellectual abilities. The third factor is the personal status of the listener. The listener's characteristics correspond to those of the speaker. Meanwhile similar features realize different regulation consequences in different communicative positions (that of the listener and that of the speaker). The fourth factor of regulation of speech communication is the presence or absence of the persons who hear the speech but are not involved in communication. To this category refer those who are unwillingly listening or those eavesdropping. The fifth factor is the properties of the communication link. The sixth factor, pre-supposition, is defined as the assumption of the speaker about the background knowledge of the listener. The image of the listener who the speaker

addresses may be different from the real personality of the listener. The seventh factor is the post-supposition, the assumption of the listener about the personality of the speaker. Non-productive (post-suppositional unjustified) communication results from the discord in the ideas of listener and speaker of each other. These may lead to awkward situations with discursive lapses known as gaffes. Political gaffes may cost a politician his/ her career.

Let us consider the regulation, information and structural features of online and classic political communication within the framework of the above theories.

The target content of speech (utterance) being the major factor of regulation of speech communication takes the most of communication load and determines the outline of communication. To exemplify the aspects of classic political discourse we can turn to the text of the political public speech by the American President J. F. Kennedy during the Cuban missile crisis dated October 22, 1962. The address to American citizens contains the president's reaction to the contradictions with the Soviet government that arose on account of the Soviet missiles in Cuba. The following excerpt is characterized by a great deal of impressive information.

But this secret, swift, extraordinary buildup of Communist missiles -- in an area well known to have a special and historical relationship to the United States and the nations of the Western Hemisphere, in violation of Soviet assurances, and in defiance of American and hemispheric policy -- this sudden, clandestine decision to station strategic weapons for the first time outside of Soviet soil -- is a deliberately provocative and unjustified change in the status quo which cannot be accepted by this country, if our courage and our commitments are ever to be trusted again by either friend or foe (Kennedy, 1962).

The dicteme is marked by the combination of speech acts of warning and threat. The pragmatics of this dicteme-warning/ threat is realized through actualization of impressive (e.g. *secret, swift, extraordinary buildup of Communist missiles*), intellectual *(e.g. which cannot be accepted by this country, if our courage and our commitments are ever to be trusted again by either friend or foe)* and emotive *(e.g. provocative and unjustified change in the status quo)* information.

Let us now consider the excerpt taken from the address to the nation by US President G.W. Bush dated March 17, 2003. The address was televised as well as published online. The speech contains an ultimatum to Saddam Hussein. The Iraqi leader is offered to refuse power under the threat of military intrusion. The following dicteme contains the speech act of threat.

Saddam Hussein and his sons must leave Iraq within 48 hours. Their refusal to do so will result in military conflict, commenced at a time of our choosing. For their

own safety, all foreign nationals – including journalists and inspectors – should leave Iraq immediately (Bush, 2003).

This dicteme-threat is of guideline type with prevailing guideline information. At the same time, the excerpt is highly impressive due to the actualized modality of obligation and simple expressive syntactic structures.

Current political addresses are not only delivered by the speakers in a live mode but also broadcast and published online. That explains the fact that the target content of speech (utterance) in classic and online political communication does not offer many differences in terms of information and content expression. Political discourse is mainly built on certain diplomatic regulations that maintain the rules generally observed in public communication.

The variations lie in the less official register of political communication. Online political discussions and blogs, especially those with anonymous posts, offer wider opportunities for making the utterance as impressive and emotive as possible which could be hard to achieve with restrictions and censorship. Therewith connected is the controversy in the US Federal Election Commission on imposing restrictions on online political speeches and videos. Republicans intend to fight regulations on online political advocacy that, according to them, "would chill free speech and potentially lead to politicized targeting of Internet writers and video-makers". The commission's chairman warned that such regulations would allow the federal government to impose … new regulations on websites such as the Drudge Report or the Washington Free Beacon" (Markay, 2014).

The second factor of regulation of speech communication, personal characteristics of the speaker in a political conflict situation is traditionally determined by political communication norms. We also argue that the style of behavior and communication of a political conflict participant directly correlates with the style of conflict behavior modes described by K. Thomas and R. Kilmann (Aleshina, 2014). There are two main strategies of conflict behavior – the strategy of partnership and that of assertiveness. Within these strategies the researchers single out several tactics of conflict behavior (Morozov, 2002): avoidance characterized as unwillingness to see and recognize the differences, denying the conflict itself; concession marked by the aspiration to establish and improve relations by means of smoothening contradictions; confrontation (competition, rivalry) is linked to the wish to stand one's ground by means of open confrontation; compromise is characterized by the aspiration to come to terms by means of negotiations; cooperation is connected with the search for solutions acceptable for the conflict parties.

Despite the mentioned diplomatic rules and regulations, political leaders may stick to different strategies and tactics in a situation of political conflict. These

strategies and tactics are similarly expressed both in classic and online official political communication.

The strategy of assertiveness is well seen in the discourse of G.W. Bush on Iraq in his address dated March 17, 2003 (see the above dicteme). The strategy of partnership that can be contrasted to the strategy of assertiveness is characteristic of J. F. Kennedy who was a popular diplomat and politically correct rhetorician. This becomes evident from the following dicteme of the Missile Crisis Address on October, 22 in 1962. Even during the crisis escalation, the President makes himself clear about the country's peaceful intentions and initiatives.

This Nation is prepared to present its case against the Soviet threat to peace, and our own proposals for a peaceful world, at any time and in any forum--in the OAS, in the United Nations, or in any other meeting that could be useful--without limiting our freedom of action. We have in the past made strenuous efforts to limit the spread of nuclear weapons. We have proposed the elimination of all arms and military bases in a fair and effective disarmament treaty. We are prepared to discuss new proposals for the removal of tensions on both sides--including the possibility of a genuinely independent Cuba, free to determine its own destiny. We have no wish to war with the Soviet Union--for we are a peaceful people who desire to live in peace with all other peoples (Kennedy, 1962).

It should be noted though that online communication in the genres of political discussions by means of posts facilitates the verbal expression of contradiction tactic and aggressive behavior by means of agonal discourse sometimes applying language means of low register (style).

The third factor of regulation of speech communication is the personal status of the listener. In terms of current political communication, we should also add the factor of the reader to this item: the personal status of the listener/ reader. The success of communication depends much on his/ her personal background including education, social status and some personal psychological characteristics such as potential conflict behavior strategies. The political text may be incorrectly perceived due to the addressee's negative experiences connected with the issue in question or the lack of expertise in it. Online communication allows for the listener's/ reader's immediate reaction in terms of expressing approval/ disapproval, support or objections (see, for example, the Politics section of the New York Times or DebatePolitics forums on debatepolitics.com). Instant messaging facilitates feedback to political moves as compared to the 20th century correspondence of the listeners/ readers with editorial boards of the media and headquarters of political figures.

The fourth factor of regulation of speech communication is the presence or absence of the persons who hear/ read the speech but are not involved in communication. This

factor is closely connected with the fifth one – the properties of the communication link.

Classic political communication tends to follow the diplomatic canons especially if it is public discourse. The violations of norms are less likely to be seen by the public on TV, heard over the radio. On the contrary, online political communication is marked by involvement of big audiences whose most parts do not participate in the process as speakers or writers but are readers. Online discussions participants are well aware of the fact that they are being 'watched', their words are being read, answered and reposted. The repost phenomena typical of online communication contributes to the wide spread of political information and global processes of influencing mass consciousness.

The sixth factor, pre-supposition deals with the image the speaker/ writer has of the listener/ reader. This factor is closely connected with the seventh factor, the post-supposition, the assumption of the listener / reader about the personality of the speaker/ writer. Non-productive (post-suppositional unjustified) communication results from the discord in the ideas of communicators have of each other. These may lead to awkward situations with discursive lapses known as gaffes.

We suggest distinguishing between two main kinds of gaffes: those consisting in the misrepresentation of information and those having to do with violations of diplomatic norms and regulations (Aleshina, 2015).

Both types of gaffes are quite common in political discourse and cause equal negative effect on the politician's image both in classic communication and online discourse.

The violation of diplomatic communication norms is, as a rule, unintended in nature and is marked by publicity. We can exemplify this with an excerpt from the rhetoric of R. Reagan (dated August 11, 1984). Getting ready for the radio address, the President unexpectedly pronounced the following while checking the microphone:

My fellow Americans, I'm pleased to tell you today that I've signed legislation that will outlaw Russia forever. We begin bombing in five minutes.

The joke did not get in the program but leaked and spread widely. European press considered the President's words totally inappropriate. The Soviet media demonstrated a sharp reaction as well (Slobodyan, 2014). The gaffe definitely contributed to the aggravation and development of the conflict situation as the joke was took seriously by the other side of the conflict. Formally the dicteme has all the signs of a true statement and is marked by predominance of factual information. Suppositional non-productiveness is based on the contradiction between the proposition intention of the speaker and the post-supposition perception of the listener.

Non-productive political communication may lead to conflict aggravation both in classic and online communication. Though classic public political discourse makes the gaffes more visible and does not allow for the immediate feedback which is possible in online political communication.

SOLUTIONS AND RECOMMENDATIONS

Having considered some aspects of political communication in both classic and online forms, we can make some generalizations. The above analysis demonstrated that both forms of political communication are affected by factors of speech regulation. There are some similarities in the target content of the utterance connected with asserting the speakers'/ writers' political interests. Personal qualities of political communicators in a situation of conflict are determined by their strategies and tactics of conflict behavior. In terms of communication link specificity, online political communication offers wider opportunities for expressing objections, doubts and aggression in a conflict situation. The speaker/ writer expects his/ her words to be seen by the public. Uncensored discourse of political online discussions and posts provides great opportunities for 'the war of words', the information war which may be defined as hostile actions of the conflict sides directed at each other with a view of suppressing the psychic and lead to moral defeat of the rival (Blokh, Aleshina, 2015) .

Studying the contradictions in political communication, we think it possible to consider the conflict in terms of military stratagems that were developed centuries ago in ancient China. Thirty-three military stratagems were described by R. Greene in his popular book "33 Strategies of War". They are applicable mostly to the stage of conflict escalation as this stage seems illustrative of conflict structure and actions of the sides.

Knowledge based economy dictates the new paradigm of information society. Different software is used by distance education instructors to develop new courses or certification programs with templates, multimedia, support and other features. Online training solutions include academic education, classroom management, external training, video conferencing, mobile learning, and social learning. The recent developments in world economy and increased global connectivity, as well as internalization of education have led to transformation of traditional education pattern. Development of software and hardware, the need for continuous training of specialists and labor market requirements, the use of modern electronic communication set new learning environment designed to use scientific and educational potential of leading universities. Distance learning is designed to help professionals gain knowledge which is based on high class skills and technology. Distance learning

uses new communication and information technologies to improve traditional way of learning. Multi-level self-organization is a new component of electronic educational environment. Distance learning has features of mobility, adaptability, service-oriented and good level of quality. To provide high level standards should be used methods in the field of Software Product Line Engineering. Nowadays the independent and co-operating service-oriented technology is considered to be the base of distance learning. It is a platform for managing information resources both in terms of the interface and from the point of consistency. Above mentioned features should be integrated for forming service-oriented environment for e-education services.

Teaching is a complex activity which involves prioritizing the knowledge and skills. Virtual communications allow developing a fully accessible online environment to explore innovation, creativity and best practices with new tools. Reflective pedagogies are innovative, they reflect on better academic performance of students. Mkrttchian V. highlights the importance of practicing reflective pedagogies. Avatar manager is a valuable contribution to "hhh" technology model; it includes the reflective practice allows managing meta-level conversations. New technological tools such as conferencing platforms, asynchronous discussion structures, social networking environments, and video sharing websites are developed which are capable for online learning. The avatar-based interface allows focusing more on the tasks of hearing, understanding and responding. Reflection pedagogies facilitate and extend learning when they are used in online learning environments, especially when delivered to connect geographically dispersed students. The Avatar manager allows to facilitate features of interaction and to integrate its principles in reflective communication practice by creating a constructive classroom environment. Making a practical dynamic advanced representation of a specific individual is a testing and multifaceted errand. At first, examinations were directed to recognize and to assess the interoperability of COTS bundles for facial modeling, rendering of continuous design, movement catch, furthermore, and content to-discourse combination. The outcome was a redone Graphical Asset Production Pipeline which exemplifies the assignments expected to make a visual representation of a human character. (Mkrttchian, 2011-2019).

FUTURE RESEARCH DIRECTIONS

The prospective research of political communication may be concentrated on describing the specifics of online discourse in terms of its structural and pragmatic properties. This study seems actual under the circumstances of rapid development of online communication and online management systems (e-government). Good

perspective is presented by researching in the particulars of different genres of online communication.

Along with that, research into linguistic organization of conflict political discourse, in both online and classic forms presents interest as well. Conflict and information war being characteristic of post-global society employ the new emerging information technologies for making their language weapons reach the target faster and more effectively.

CONCLUSION

1. Both classic and online political communication types are marked by similar pragmatic background connected directly with assertion of own political interests, the main motive being need for domination. The theory of factors of speech regulation and the theory of dicteme applied to both political communication types prove this similarity with the corresponding similarities in the target content of the speech, the communicators' properties and their suppositions and assumptions about each other.
2. Classic political communication, unlike the online one, is more regulated by the standards of diplomatic discourse. The uncensored online discussions provide more opportunities for realization of conflict and information war strategies. Instant feedback allows the online communicator to correct the non-productive political communication.

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Chapter 13
The Use of Blockchain Technology Tools in Modern Education Reduces the Likelihood of "Robotization" of People

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ABSTRACT

There is a need to get into a "clearing house" to shed light on certain operational concepts in the question at hand: (1) modern; (2) education; (3) "robotize"/"robo tization"/"robotizing"; and (4) people. People. In the present discussion, "people" may not only refer to students in a situation of formal schooling. It generally refers to all learners under normal circumstances and this context is taken in the light of what is previously pointed out in #2 where the inclusive application of the term education is given emphasis. "Robotize"/"Robotization"/"Robotizing". It is a neologism or a coinage, if you will, which is derived from the term "robot". A robot is basically a human-programmed machine capable of automatically performing tasks both simple and complex. Education: In simple terms, education involves teaching (in all its forms, so that it could be a learner teaching her/himself or an entity other than the learner that is the source of matters to be learned).

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INTRODUCTION

Modern society's development is connected with the use of digital technologies in all spheres. Digital technology as a system of methods and techniques are focused on receipt, storage, processing, use and dissemination of information with the help of computers. Performance and versatility of this schema have made IT popular. The development of research methods based on digitalization in the field related to solving problems of improving the level and quality of human life is particularly relevant. Bioinformatics in this sense is one of the most promising areas of digital technology.

Bioinformatics (computational biology), which appeared at the intersection of molecular biology, genetics, mathematics and computer technologies, studies the sequences of nucleic acids in DNA/RNA or amino acids in proteins, their evolution, construction patterns, the relationship between the sequence of elements and the spatial structure of macromolecules, its physical properties and functions (T. Attwood, Parry D. Smith, 1999; A. Lesk, 2008). Bioinformatics as a synthesis of different sciences allows forming a new level of understanding biological processes occurring in cells and organisms. Various methods of applied mathematics, statistics and other exact sciences are used in bioinformatics.

One of the tasks of bioinformatics is processing a huge array of different biological data, identifying patterns that cannot always be seen in a conventional experiment, predicting the functions of genes and proteins encoded in them, building a model of gene interaction in the cell, drug designing. Using blockchain technology that can complement traditional methods of bioinformatics is of particular interest here.

BACKGROUND

Blockchain technology was proposed in 2008 by Satoshi Nakamoto. This technology was the basis of the first cryptocurrency, Bitcoin. The blockchain can be defined as a distributed decentralized database that continues to register data records confirmed by the respective nodes. All data is stored in a public ledger, which includes all registered transactions. The blockchain consists of a linked sequence of blocks containing transactions with timestamps that are protected by cryptography. Blockchain technology allows recording transactions continuously keeping them unchanged while providing constant updates. Accordingly, the blockchain is provided partly by the database, partly by the development platform and partly by the virtual network intermediary.

The main characteristics of any blockchain are:

- Decentralized structure of data storage;
- The highest level of data storage security;
- Distributed data storage;
- Maximum system transparency for users;
- Inability to falsify once recorded data.

MAIN FOCUS OF THE CHAPTER

The Advantages of Using the Blockchain

When we make any transactions in our life, for example, buy an apartment, sell a car or transfer money, information about them is stored in the databases of various companies or government agencies. But in case of an unauthorized access or a server failure information can be stolen or lost. However, in case of using blockchain technology such negative consequences cannot happen, information about transactions is stored not in one place, but simultaneously on thousands of different computers. In addition, when forming a block of transactions, two keys are created in the system, one of them is a fully public key, which is used only to check the basic information on the block, and the second key is secret and is known only to the owner of certain transactions. It will not be possible to hack the blockchain by conventional methods. Anyone who tries to do this will face the inability to crack one particular block without changing the others because they are closely linked. To do this, the attacker will need a lot of time and computing resources, but since the system is decentralized, it will immediately track the changes, checking the blockchain with data on other computers.

Transactions (transfer of information, signing a contract, etc.) in everyday life are accompanied by the use of intermediary services with subsequent payments for the use of these services. However, no one can guarantee the absolute reliability of these intermediaries. Blockchain technology allows excluding the intermediary link in the information transfer, which is also an advantage of using this technology.

Currently, the blockchain is compared to the most important inventions of humankind, for example, the creation of the Internet. The blockchain can be used in various fields: trade, finance, insurance, medicine, etc. In the banking sector of the economy blockchain technology is considered as an opportunity to organize a new and secure way to conduct customer transactions. The prospects of the blockchain in the financial sector have been recognized by the world's largest banks. Back in 2013, the R3 consortium was established, which includes such banks as J. P. Morgan, Goldman Sachs, Santander, ITG and others.

Public authorities see blockchain technology as an opportunity to store cadastral data. Using the platform, any user can transfer information to another one in an encrypted form, without fearing that their information will be intercepted and used by criminals. The lack of local storage completely eliminates this possibility.

This decentralized data system has the potential to eliminate corruption. In the blockchain you can record people's birth dates, financial transactions, fingerprints, store information about documents such as diplomas, passports, driver's licenses.

According to the estimates of the consulting company International Data Corporation (IDC), world expenditures on blockchain projects in 2018 reached $1.5 billion. According to experts, in 2019 the volume of the global blockchain market will grow by 88.7%, amounting to $2.9 billion, and in 2022 it will be measured $12.4 billion. The average annual growth rate of the market is expected at 76%. The financial sector, manufacturing, mining and retail trade have become the most attractive areas for investment in blockchain technology. The United States remains the leader in expenditures on blockchain solutions, followed by Western European countries and China, but Japan and Canada are unbeatable in investment growth rate (Worldwide Blockchain Spending Forecast to Reach $2.9 Billion in 2019, According to New IDC Spending Guide, 2019).

World-scale projects based on the blockchain:

- Russia has designed a pilot project to develop a platform for the Federal registration service; Sberbank is involved in a joint project with Americans on the issue of creating a platform for international interbank payments SWIFT;
- The USA and Brazil are testing a system that allows identifying a person;
- Finland has applied the platform for refugees' identification;

Business solutions are being developed by such companies as Microsoft, Azure, SAP, IBM, Samsung and others.

SOLUTIONS AND RECOMMENDATIONS

Blockchain technology allows expanding traditional methods of study in bioinformatics. One of the problems of bioinformatics development is the storage of constantly increasing information. For example, the full genomic data of humans, frogs, mice, some species of fish, etc. have already been deciphered. In order to understand the importance of the problem of the presence of large amounts of information, which bioinformatics scientists deal with, it should be noted that the human genome contains about 3 billion letters (nucleotides A, T, G, C), which is equivalent to 15,000 book volumes (G. Nesgovorova, 2012). The amount of genetic

information, accumulated in the data banks, began to expand at an increasing rate after fast methods of sequencing (decoding) of nucleotide DNA sequences were developed. Advances in computer science, linguistics and information theory have made it possible to analyze genetic texts. The interrelated development of bioinformatics with other fields of science allows us to expect the formation of a new level of understanding biological processes that are going on in cells and organisms. Currently, more than 200 genomes of various bacteria have been decoded, each containing several thousand genes. In 2004, researchers from the International Human Genome Sequencing Consortium (IHGSC) announced a new estimate of the number of genes in the human genome ranging from 20 to 25 thousand (IHGSC, 2004) (10 times more than a bacterium, and 2 times more than a fruit fly have, and the number of synthesized proteins is by far more).

The use of the blockchain allows expanding the possibilities of storing large amounts of information, observing the principle of a common global information space that unites the efforts of scientists working around the world. Of course, nowadays there exist databases of genetic information. For example, the most complete and ordered information on the human genome is stored at the NCBI portal – www.ncbi.nlm.nih.gov, which is supported by the staff of the National Institutes of health, the USA. However, the introduction of blockchain technology will form the most comprehensive database on the human genome.

The use of blockchain technology allows solving various problems of collection, storage, use, and transfer of biological data. Depending on the tasks, the following types of blockchain technology can be used:

- Public blockchain, which is an open platform for all users. Bitcoin and Ethereum are based on it. This type of the blockchain does not have a governing body that confirms transactions. The public blockchain is "controlled" by the entire community of network participants, i.e. developers, users, service providers, miners, who ensure the integrity of the network and convenience of working in it. The efficiency of the network is achieved through updates of the protocol to prevent harmful changes. That is why the system allows creating decentralized applications at minimal maintenance costs. This type of the blockchain can serve as the basis for creating a global database of biological data;
- Private blockchain (private permissioned blockchain) that suggests some limited access, transactions are confirmed by certain people. It may be a governing body, a senior officer, the government, an institution or someone else. The chain and blocks data can only be seen by a certain circle of people, for example, employees of one company. Therefore, such a blockchain

is provided for corporate use and protection of commercial classified information;

- Consortium (hybrid) blockchain that involves incorporation of several organizations to create a common blockchain, for example, if several corporations need a common private network for doing business without third parties' participation. Such platforms take the most appropriate implementation parameters for operation. The most common features that unite all hybrid blockchains are as follows:
  - ° Mandatory identification;
  - ° Network access is granted to participants who meet certain requirements specified by the developers;
  - ° Transactions are confirmed by a group of administrators;
  - ° Existence of a monitoring body.

Users still have the right to read and add entries, but it can only be done by authorized persons, or rather system nodes. It is convenient to maintain intellectual property rights within the consortium. As a result, this type of blockchain is beneficial for projects dealing with innovative investments.

Genome information storage on the basis of the blockchain will form a global database of the human genome. Hypothetically, each person will be able to encrypt their genome in the form of a block. In the first place, creating a common database of the human genome will make a person's identification possible based on their genetic passport. The possibility of creating a genetic passport becomes quite real, as the cost of this service is getting more and more affordable. The data of the genetic passport can be used to design drugs, determine the relationship, in criminology, etc. David Koepsell, the creator of the platform EncrypGen for storage, protection and transfer of genetic data said: "All this [the blockchain] leads to a revolution in genome studies and gives patients real protection of their data. The blockchain expands the possibilities of genetics as a science. In addition to encryption, it allows managing transactions, while providing full transparency"

The Attributes of Modern Education

Modern formal education in highly civilized societies is distinctively marked by the predominance of tools, implements, and devices whose main operational condition is literally right at the tip of one's fingers. Most of these so-called cybertech gadgets are essentially digitalized and a simple touch on the screen of an I-pad, I-pod, tablet or smart phone or a flick on the soft-touch keyboard of a laptop or notebook brings one to a seemingly endless information superhighway and a panorama of exciting scenarios via the Internet. This could even be construed as the realization of the

"Global Brain" metaphor that constitutes what the late Russian cyber philosopher Valentin Turchin called "Social Super organism" in the comprehensive knowledge network he called "Principia Cybernetic" (http://pespmc1.vub.ac.be/). This so far is the highest monumental achievement of humanity in the modern age. And the entire gamut of this virtual universe has revolutionized practically all aspects of the reality we know at this point in time.

In the particular field of education, the Internet has opened up myriads of seemingly inexhaustible windows through which the flow of information gives the impression of an eternal fount. The cyber world has provided humanity with a teacher utilizing a totally new pedagogical methodology. On one hand, this state of affairs is beneficial to all learners because the process of learning doesn't any longer require a Herculean effort to achieve. Research sources--both academic and non-academic--have been made easily available and research studies may be done mostly online with no sweat at all, so to speak. For the more seriously discriminating and hence in-depth learner engaged in both academic and non-academic pursuits, the importance of critical inquiry is the leading demand to come up with an honest-to-goodness study which has been made less stringent by an array of sources made available online. In this case, education is still in the right direction.

On the other hand, however, the more attentive observers among us have noticed some flaws along the way. There are also Internet beneficiaries whose only intent is to promote a unilateral line of thought in the supposed "investigative study" that they do and in the process draw supportive notions and theories from sources whose trustworthiness they never even try to verify for the sake of consistency and integrity. In other words, such a study lacks the critical element present in a more credible treatise on the basis of an in-depth erudite theoretical investigation. In this sense, the person engaged in such a haphazard and superficial endeavor defeats the very essence of learning and hence of education. What we find here is someone who has unwittingly anaesthetized her/his critical faculties by simply following the queue of like-minded "puppets" fabricated by the pied pipers of the Internet networks. We therefore have here a "robotized" individual who has lost his critical ability, decision-making power, and proficiency to distinguish between right and wrong.

But is There Really Such a Thing as "Robotizing Education"?

The concept of "robotizing education" is a contradiction in terms. Authentic education brings out and enhances the hidden potential of a human person. In the course of time, real education liberates the learner from "Plato's cave" and provides her/him with unlimited space for the unraveled potential to grow and flourish. In this connection, honest-to-goodness education can never be a "robotizing" agent. When someone puts her/himself in a learning situation, s/he is confronted by and

hence in the presence of a facilitating agent called a "teacher" in whatever forms it takes. While it could be the traditional human teacher, in the modern context, it could also be virtual facilitator that utilizes the instrumentality of the cyber world called artificial intelligence (AI). Considering all possibilities, the risk basically lies on the side of the teacher with all the available pedagogical methods at her/his/its disposal. That is the area where the "robotizing" effect is generated. But getting "robotized" or not solely depends on the learner.

Drawing our line of thought from the above considerations brings us to the notion that there isn't such a thing as "robotizing education". If it is education in its truest sense, it isn't deemed to "robotize" because the latter is the rejection of the former. They cannot go together especially if we bring to mind once again the idea that education promotes learning and learning liberates human potentiality and enhances the critical ability and the uncorked facility of the human person to decide for her/himself. If a system is "robotizing," it is absolutely not educating. But regrettably, such a system exists under the guise of education. This is the very circumstance that has created a tremendous confusion and anomaly that has tarnished the honor and nobility of genuine education. And may we not subside to the level of forgetfulness and think that this anomalous system of so-called "education" has just been recently inaugurated in the modern era. We have had this aberrant system of "education" for so long, so that the petrification process that seeped into its incongruous pillars has established a lasting foundation of manipulative--even exploitative--"educational" institutions we have now. These institutions constitute the powerful factor that aligns toward uniformity the trend that organizes and establishes unquestioning, uncritical, passive and line-toeing denizens of a social order under the hegemony of its unscrupulous and guileful leaders. This system of "education" is the irreconcilable antithesis of true education. This is the counterfeit education that has "robotized" people and transformed them into servile vassals of the system who have not been equipped to critically put forward challenging issues and queries to generate worthwhile social progress to make the world a much better place to live in.

CONCLUSION

In the final analysis, it is not honest-to-goodness education--modern or not--that "robotizes" people; it is rather the flawed system of instruction that erroneously calls itself "education" which instead of facilitating learning has promoted indoctrination with the final aim of creating dogmatic and subservient sycophants of a society programmed and run by the powers that be. The current continuously goes on in the present modern era with increased intensity as the instrumentality of manipulation

and exploitation is ably provided by and acquired from the modern limitless domain of cyber technology.

Is modern education "robotizing" people? No, definitely not. Modern honest-to-goodness education with all the facilities of modern technology is exhilarating, liberating and empowering. It is the digressive system of institutionalized instruction in the guise of education--and hence antithetical to the essence of authentic education--that "robotizes" people.

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Chapter 14
Training for the Digital Economy

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ABSTRACT

In this chapter, we will focus on training because the success of the digital economy is determined by knowledge, and therefore the people who create and apply knowledge. In the context of the digital economy, training has two main contexts: training with competencies that are in demand for the digital economy (regardless of the learning technology), and e-learning, in fact, implementing digital technologies in education, for training in any field. In general, the Federal project "Personnel for the digital economy" offers a fairly comprehensive approach to training. It is planned to create conditions for the implementation of personal trajectories of development and profiles of competencies of citizens, the development of the education system for the training of competent specialists in the field of digital economy, the implementation of retraining programs for the professions in demand in the digital economy, the involvement of highly-qualified foreign specialists, and the implementation of promising educational projects with the support of the venture fund.

INTRODUCTION

The term Digital Economy was coined by Don Tapscott in 1996. From the conclusions made in this fundamental work, we note related to the subject of this article:

- In the new economy knowledge is the driver and other traditional resources are secondary.

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- Organizations will be forced to change their old opinion of employees and try to retain and develop the capabilities of knowledge workers. Traditional organizational structures are giving way to a more fluid and flexible work environment. Project teams are more the norm with people from all parts of the world coming together, and people should be ready for such work.
- In the innovation economy, human imagination and creativity are the main sources of value. In a digital economy, the challenge lies in creating an environment which encourages and rewards innovation.
- The problem is that in the new age, the gap between the technologically literate 'haves' and the 'have-nots' who do not have access to technology, is growing and may cause significant problems to society in future.

At the same time, the paper highlights the main areas in which the digital economy will cause fundamental changes, including learning and education. Today, the digital economy has become an important part of the world economy. Suffice it to say that in the list of the largest companies in the world by capitalization, the first 4 places, as well as places from 6 to 8 are occupied by companies of the digital economy. The development of the digital economy provides tremendous opportunities, but also carries serious challenges associated with the massive obsolescence of professional skills and even entire professions, data privacy, computer security, etc.

The importance of the digital economy is recognized by almost all countries, in the US the Council on Competitiveness shapes policies and runs programs to jump-start productivity and grow America's economy. The national project "Digital economy" has been launched in Russia. In the framework of the national project selected 6 of the Federal projects:

1. Regulation of the digital environment
2. Information infrastructure
3. Cadres for the digital economy
4. Information security
5. Digital technology
6. Digital public administration

BACKGROUND

In this chapter, we will focus on training, because it was noted above that the success of the digital economy is determined by knowledge, and therefore the people who create and apply them. In the context of the digital economy, training has two main contexts: training with competencies that are in demand for the digital economy

(regardless of the learning technology) and e-learning, in fact, implementing digital technologies in education, for training in any field. In general, the Federal project "Personnel for the digital economy" offers a fairly comprehensive approach to training. It is planned to create conditions for the implementation of personal trajectories of development and profiles of competencies of citizens, the development of the education system for the training of competent specialists in the field of digital economy, the implementation of retraining programs for the professions in demand in the digital economy, the involvement of highly qualified foreign specialists, the implementation of promising educational projects with the support of the venture fund.

The Project traces the activities aimed at the following areas of training (although they are not formally divided into groups):

- Improving the skills of the General population in the digital economy (training of users of the digital economy, including employees who use the opportunities of the digital economy, but do not create them on their own, preventing the opportunities of inequality caused by the inability to live and work in the digital world).
- Training of specialists in the most critical areas for the development of the digital economy, primarily it (training of professionals in the digital economy).
- Training of students in the field of natural Sciences and basic competencies of the digital economy – the Foundation for the future to become specialists in the digital economy.

The project plans to train 10 million people in online digital literacy programmes by 2024 (all figures are for the same period, unless otherwise explicitly stated). To improve skills in the development of digital economy competencies, it is planned to create a state system of personal digital certificates, within which 1 million people should be trained. As a result of the project, all graduates of the vocational education system should have the key competencies of the digital economy (the concept of the basic model of competencies of the digital economy, the list of key competencies and the mechanism of their actualization should be developed by October 1, 2019).

To train specialists, it is planned to increase to 120 thousand people admission to higher education programs in it specialties by 2024, which is almost 2 times higher than in 2018.

It should be noted that already now many universities face problems in the admission of students in the field of information technology (as well as engineering in General). The problem is caused by not too high level of training in mathematics, physics, computer science in schools. This complicates both the training of professionals from having a weak starting preparation of applicants, and is faced with a formal

constraint in the set. Many students, realizing the low level of their training, do not choose the exam in computer science, preferring simpler humanities.

MAIN FOCUS OF THE CHAPTER

Admission to in Computer Science or Information Technology is legally allowed only with the state exam in computer science, so in many regions there is a situation where the number of budget-funded places of admission is actually equal to the number of successfully passed the exam in computer science. It is clear that in such circumstances it is impossible to significantly increase the number of students enrolled in it professions. Therefore, very logical look laid down in the Project measures to support secondary education, as a result of which:

- 1 455 schools with the best results in teaching Mathematics, computer Science and Technology will receive grant support to spread their experience;
- 33 thousand students who have shown outstanding abilities in the field of mathematics, computer science and technology will receive grant support;
- 133 thousand children will take part in the profile shifts of children's camps with the theme of mathematics and computer science, digital economy technologies.

Thus, the level of training of schoolchildren should be increased, which in the future will allow them to prepare highly qualified specialists of the digital economy.

The key to the success of the digital economy is its spread without large territorial disparities, i.e. the spread of digital economy competencies, training for it, the development of technologies and enterprises implementing them not only in large scientific and administrative centers, but in the maximum number of regions. It should be noted that in Russia there are very large differences between the rich regions (Moscow, St. Petersburg, several resource-producing regions) and the other regions with usual level and quality of life. It is important that the development of the digital economy contribute to smoothing, not increasing, these imbalances. The most important issue here is the training of competent personnel of the digital economy, so let's consider how this problem is solved in a large regional University – Penza state University (PSU, where more than 20,000 students study, that is about 60% of students of the Penza region).

As the starting conditions change. it should be noted that PSU trains specialists in a wide range of technical, pedagogical, medical, economic and humanitarian specialties. In particular, he trains most of the region's personnel in the field of mathematics, computer engineering, computer science and information technology. In addition,

due to the interest in new challenges, as well as the financial factor (much higher pay), many graduates go to work in the companies of Moscow, St. Petersburg and beyond Russia. From the point of view of the use of modern educational technologies in PSU have considerable experience, methodological, software and technical base.

PSU has implemented the distance learning technology since 1996.

Now PSU uses distance learning programs completely or partially for advanced studies and training of public employees and business managers, university professors and teachers, and a number of other programs.

Together with the introduction of distance learning programs, e-learning elements have been gradually integrated into traditional education programs. At first it took place by means of widespread application of e-learning resources or electronic educational resources (EER) and computer testing. Modern socioeconomic development of society, marked by the increasing role of technology, is non-linear, ambiguous and exists in a complex interweaving of interests, goals and real prospects. A significant place in the resolution of emerging contradictions in economic development belongs to the state, whose task is to conduct an optimal economic and social policy under the formation of digital economy. The possibilities of forming a modern economy that meets the challenges of the XXI century are determined not only by internal factors of self-development, but also by the efforts taken by governmental agencies to form a single technological concept for the development of national economy. In order to develop digital economy, it is necessary to define a concept at the state level, in which the main directions of development concerning citizens, business and the state are formulated. In many countries, governmental agencies have developed documents that provide the legal framework for building digital economy and reflect the conceptual framework for understanding digital economy (Petrov et al., 2016):

- **China:** "Made in China 2025", "Internet Plus", "National Plan to Stimulate Technological Developments in the Sphere of Artificial Intelligence";
- **Germany:** "Digital Strategy 2025", "Industry 4.0";
- **The USA:** "Strategy of Innovative Development", "National Strategic Plan for Advanced Manufacturing";
- **France:** "Union for Future Industry / New Industrial France";
- **The UK:** "UK Digital Strategy", "Digital Economy Act";
- **Australia:** "National Digital Economy Strategy";
- **Austria:** "Industry 4.0 Austria";
- **Japan:** "Smart Japanese ICT Strategy";
- **The EU:** "Digital Single Market";
- **Sweden** "Smart Industry – a Strategy for the New Industrialization of Sweden";
- the Netherlands: "Smart Industry";

- **Russia:** "Strategy of Information Society Development in the Russian Federation for 2017-2030"; national program "Digital Economy of the Russian Federation" (Petrov et al, 2016).

The task of the state in the context of digital economy formation is to create a legal framework, infrastructure in the form of extensive high-speed Internet, and regulation of security issues. In many countries, governmental agencies are creating public digital services for citizens. For example, in Russia, "e-government" has been created as a complex of information systems for the provision of public services in electronic form. An example of the effective use of digital technologies is the activities of the tax authorities of Scandinavian countries – Sweden, Finland, Denmark and Norway. In these countries, tax calculation and tax write-off are carried out automatically with further notification to check the calculations.

Analyzing the programs of digital economy development in the leading countries in the field of ICT distribution, it is possible to identify common problems that need to be solved: Internet extension, Internet security, digital literacy, innovations. For example, let us consider the development programs of the leading countries in the field of digital economy – the USA and Sweden, which are leaders in digital technologies development

SOLUTIONS AND RECOMMENDATIONS

Electronic informational educational environment (EIEE) provides efficient communication between teachers and students and containing students' portfolios, their achievements and results, attendance and learning outcomes etc.

Currently e-learning resources are used in distance learning technologies and classical learning technologies. Development of educational programs may require a large amount of e-learning resources in various fields, disciplines, subjects and difficulty levels. In this regard, much attention is paid to minimizing the cost of providing support throughout the life cycle of e-learning resources. The authors (Krevskiy, et al., 2013) consider the life-cycle model of e-learning resources as a stage mechanism.

EIEE provides the following main features:

1. Access to curricula, subject's working programs, publications in e-libraries and electronic educational resources (EER), specified in work programs
2. Record of study progress, interim assessment of results and basic educational program mastering results

3. Carrying out all kinds of activities, learning outcome assessment procedures to be implemented via e-learning
4. Creation of electronic student portfolios, containing saved works of students, reviews and ratings on these works
5. Interaction between educational process participants, including synchronous and (or) asynchronous communication via the Internet.

The system is used by more than 20,000 students and about 3,000 employees, it contains more than 600 curricula, about 30 000 training courses.

Algorithms for developing distance learning at the university and introducing e-learning into the traditional educational process considered.

In order to train personnel for the digital economy, PSU adopted the target program "Modernization of the educational process and material and technical base for training of personnel in the digital economy". The implementation of the program should solve the following tasks:

- Improvement of information systems of PSU, designed to provide an environment for improving the educational process of the University;
- Organization of the system of training and continuous professional development of digital economy personnel in the region on the basis of extensive use of information technologies, involvement of practitioners, building flexible educational trajectories.
- Improving the competencies of students at all levels of education in the field of information technology, preparing them for work in the digital economy, training other categories of the population in the skills of the digital economy.
- Improving the educational process of PSU through the development and implementation of online courses, distance learning technologies and e-learning, modernization of the classroom Fund, equipping with modern high-tech and demonstration equipment.
- Professional development of teachers, researchers, academic and administrative staff to prepare for work in the conditions of the educational environment formed in the University.
- Development of a multi-level system of training and continuous professional development of teachers in the region to ensure their readiness to implement modern models of the educational process, taking into account the requirements of the digital economy.

The program has subroutines:

- Improvement of the educational process;

- Improving the information environment of the University;
- Modernization of material and technical base.

For the transition of the University to the training of digital economy and further digitalization of its activities, the following main actions are planned:

- Expansion of academic mobility of students through the creation of their own online courses and transfer of study disciplines or their fragments through online courses of leading universities;
- Participation of software companies ' specialists in the training of students of it specialties (distributed development, specialists control the work of students with the help of software project development management systems);
- Inclusion of the study of the digital economy all educational programmes (taking into account the specifics of the engineering, economic, legal, educational, medical and other specialties);
- Expansion of the University's participation in improving the quality of students ' training (including through video conferences and online courses);
- Development of modular educational programs of additional professional education of adults in the areas of digital economy using online technologies;
- Professional development of teachers, management and support staff in the field of digital economy, modern digital educational technologies;
- Development of software tools for the management of the University;
- Improvement of tools for monitoring and controlling the use of the information environment of the University;
- Development of tools for big data analysis and improvement of educational content, curricula and individualization of educational trajectories.

The planned activities should allow Penza State University to become a regional training center for the digital economy, to develop domestic and international cooperation with scientific, academic and industrial centers, actively developing the digital economy.

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KEY TERMS AND DEFINITIONS

Blockchain: As a technology is a process of continuous recording of transactions keeping them unchanged; as a database it is a decentralized storage of cryptographic information consisting of blocks.

Economic Interests: Are a property of an economic entity that consists in motivated economic activity in order to meet needs through the effective use of available resources in the process of economic relations for a certain period of time.

Chapter 15
Open Education in Digital Era With Avatar-Based Control and Estimation

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ABSTRACT

Open education becomes the important approach for education in the digital age and it plays a significant role in broadening educational access and increasing higher educational opportunities. The author of the chapter considers the basic principles and emerging trends in quality assurance of distance higher education in the digital age. Considering the intelligent distance education system as a dynamic, time-developing system, one can speak of the underlying computer imitation model that has an independent theoretical and practical value. The objective of this chapter is to explore how can information technologies influence the distance education quality assurance, specifically, to develop a conceptual framework for the intelligent distance education system. In addition to direct application for educational quality management system's evaluation, the simulation model can be used to solve a much wider range of tasks: forecasting, risk assessment, rating of courses, individual teachers, and individual institutions.

INTRODUCTION

The ratio of learners in the open and distance universities is increasing rapidly in last years. The focus today should be on the quality maintaining process of the open and distance universities to assure the high quality of education. Distance education

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is a method of education in which learners are physically separated from educators (Kaya and Tan, 2014).

The emergence and application of information and communication technology (ICT) in educational settings significantly imply the changes in the learning tools utilized in the modern learning environments (García-Peñalvo and Conde, 2015). The Internet-based distance education is considerably growing. Information technology (IT) and infrastructure development allow the effective delivery of educational contents worldwide.

The main trend in open and distance learning educational system is expansion of access to educational services, improvement of educational services' quality, enhancement of educational system efficiency and increasing the productivity.

The quality of open and distance learning system management is proposed as a set of administration support systems with the organizational structures, procedures, educational technologies and resources, needed for the implementation of the education policy quality through planning, management, and maintenance, and quality improvement.

In order to better study the distance learning motivation, learning effect and educational outputs of distance education, a big data analysis and machine-learning tool is proposed in this paper. The practical implementation of the research results can effectively improve the teaching quality of distance education courses in higher education institutions.

The authors in the article consider the basic principles and emerging trends in quality assurance of distance higher education in the digital age.

The objective of this article is to explore how can information technologies influence the distance education quality assurance, specifically, to develop a conceptual framework for the intelligent distance education system. Finally, future research directions are discussed, and the main conclusions of this study are listed.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

This section gives the reader an overview of main research works and contributors associated with the paper.

There is the tremendous growth in the use of the Internet to deliver distance education at community colleges (Cejda, 2010). The virtual environment offers many interesting options for continuous dialogue, through the application of such tools as asynchronous e-mail or threaded discussion forums, real-time conferencing platforms, and instant messaging functions (Meyers, 2008). Distance education can be defined as a result of the attempt for educational progress (Gündoğan & Eby, 2012).

Atkinson (1976) states that in order to improve learning strategy's efficiency it is necessary to ensure it adaptability. Therefore, adaptive learning systems should change and select educational strategies for each concrete situation to improve the learning process and achievement of its goals. Besides, the given system is capable of collecting information about students and storing it in special modules, which in turn ensures an individual approach to every student (Brusilovsky, 1996). The urgency to develop adaptive learning environments is also proved in works by a number of authors (Chang, 2005; Lin, 1998).

Chang et al. (2006) proposes to use a personalized web-based learning system, founded on the item response theory (IRT). This system is focused on arranging such an educational environment that takes into account students' capabilities and difficulties they face when studying.

Lin and Kuo (2005) created a virtual learning environment that meets all the needs of the individual adaptive approach to student teaching. The environment is based on the theories of constructivism and learning objects.

Currently, there is a lot of speculation about SMART - education, but there is no common understanding of what it is. The prefix SMART, usually identified with a meaning "clever", applies to different objects (smart phone, smart home, SMART city, SMART - society, etc.) and is directly related to the use of the latest developments in information technologies. Russian scholars in their works on SMART – education (Tikhomirov, 2011) consider it as the education of future, where "the Internet is to become the main source of knowledge for students, the technology will be individually targeted and focused on creating new knowledge". The authors (Dneprovskaya, et al., 2015) formulate the following basic principles of SMART - education:

1. Usage of relevant information to solve educational problems within educational programs;
2. Organization of independent educational, research, design activities of students;
3. Implementation of the educational process in a distributed learning environment;
4. Interaction of students with the professional community;
5. Flexible educational trajectory, individualized instruction.

Diverse educational activities require broad opportunities for students to study educational programs and courses, and to use learning tools, in accordance with their abilities, financial and social conditions.

The authors (Dneprovskaya, et al., 2015) also consider information and communication technologies (ICT), organizational and pedagogical aspects of SMART- education.

Boychenko (2011) notes that when we speak about SMART – education with regard to information systems, used in learning processes (LMS / LCMS), "we refer to the increase of their "intelligence" by implementing these additional features that enhance the quality, intensity and other learning attributes". Among the aspects of LMS / LCMS functionality expansion at the stage of SMART - education one should pay attention to the following:

- Subject mastering support (semantic marking of subjects and individual monitoring of student's position on a subject's semantic graph);
- Development of practical competencies based on creation of virtual laboratories, real business models and virtual environments, and services that enable students to conduct research and development on this basis, create virtual innovative enterprises etc.

It also points out good prospects for a combination of cloud computing technologies as a technological base and for development of applied (SMART) technologies on the said basis.

Ji-SeongJeong, Mihye Kim & Kwan-HeeYoo (2013) consider development of the SMART - educational system on the basis of cloud computing. The system is distinguished by the use of a cloud-based platform, a universal file format to display various contents via different devices, tools for creating different types of content, means of content viewing, a reasoning subsystem and a data protection sub-system. In our opinion, the most interesting component here is the reasoning mechanism for providing students with personalized learning content based on their preferences, learning styles and patterns of content usage. To do so, the system stores and processes students' characteristics, their academic achievements etc., using a variety of data analyzing methods. Thus, SMART - education is the continuation of e-learning. Since the development of e-learning follows the development of technologies, the occurrence of Web 3.0 will entail the third stage of e-learning development (e-learning 3.0) (Rubens, et al., 2011). The key areas of development include distributed computing, advanced mobile technology, 3D visualization and interaction, intelligent interaction, searching and content filtering technologies. Basically, those are very similar to trends that distinguish features of SMART - education. It will be fair to assert that SMART - education is a holistic educational system based on e-learning 3.0, focused on intelligent interaction of technology and content selection, providing individual educational trajectories, adapted to learner's peculiarities and his/ her learning goals.

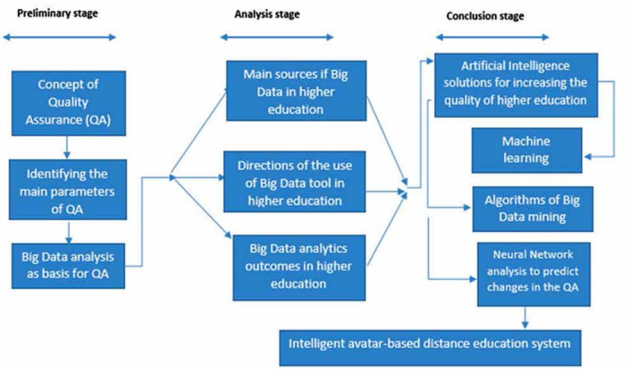
RESEARCH METHODOLOGY

The adopted methodology to conduct this study is depicted in Figure 1. It is composed of three sequential stages: (i) preliminary stage; (ii) analysis stage; and (iii) conclusion stage. In the preliminary stage, the concept of quality assurance is defined and explored in its multiple dimensions. Next, this study analyzes the main parameters of quality assurance in higher distance education that measuring the level of this indicator in different higher education (HE) institutions. Afterwards, the analysis stage emerges, which is a crucial point in the methodology. In this phase one of the most troubling challenges of Big data is explored, what are the main sources of BG in HE, directions of the use of Big Data tool in higher education and what are the outcomes of Big Data analytics in HE, which intends to identify measures that HE institutions can implement to increase the quality level of distance education. Finally, future research directions are discussed, and the main conclusions of this study are listed.

QUALITY ASSURANCE FOR DISTANCE HIGHER EDUCATION

In recent years, there has been the need to improve on quality assurance in higher education to enhance productivity and minimize wastage and this gave birth to a proactive and modern approach away from the traditional view of quality control to quality assurance (Cole, 1996, p. 237). This new approach has been variously

Figure 1. Phases of the research methodology



termed Quality Management (QM), Total Quality (TQ), Total Quality Management (TQM) (Gundogan, 1996, Bilich and Neto, 1997, Bajaria, 1997).

Quality assurance of distance higher education should be considered as a set of organizational structures, procedures, educational technologies and resources needed for the implementation of education quality policy through planning, management and maintenance.

Education quality is a set of educational services properties and characteristics, thanks to which the student needs are met – as the consumer the knowledge to specific knowledge at a particular time with appropriate documents registration. Quality begins with the identification of students' needs.

When you focus on the quality, the leaders of open and distance learning systems need to solve two major issues. *Firstly*, they need to develop a strategy that will enable the organization to achieve educational success due to the high quality of knowledge acquired by students, the demand for their labor market knowledge. *Secondly*, the heads of educational institutions have to fight not only for the professional teaching, but also for its quality.

Heads of educational institutions set goals and strategic directions of the activity and create an internal environment in which personnel staff fully engaged and interested in the realization of the set goals.

The quality of education should be considered as a social category, it meets the needs and expectations of society in the development and formation of civil, residential and professional personality traits.

There are three areas of the requirements for the quality of education:

- Individual requirements,
- The requirements of society,
- State requirements.

Total Quality Management (TQM) is a system of management based on the principle that every staff member must be committed to maintaining high standards of work in every aspect of a company's operations.

For education TQM is a system of organization of educational process in the system of open and distance learning, in which the entire staff of the educational institutions at all levels involved in the continuous improvement of the quality of educational services, expanding them and improve the educational process itself.

The greatest effect TQM gives under the agreed use of the concept of levels: individual; departments, laboratory; school, college, university; education system in the region or country.

TQM requires the ability to work in a team, so a critical success factor in a system of open and distance learning is organized learning.

In terms of education industry, the state and society as consumers demand and expect the country's economy, people's livelihood, increase cultural, educational, political and social literacy. Companies expect professional competence, communication specialists, positively related to their profession.

In order to be able to satisfy the expectations of the external consumer (student), it is also necessary to satisfy the requirements within the organization, which is the basic condition for achieving quality results. Operation of the system should be carried out due to the involvement of all staff, but senior management takes full responsibility for achieving the goals of the quality policy.

Quality assurance should be based on process management based on actual figures and the final stage is designed to provide results based on their performance of the learning process, which refers to its contribution to the objective function of the quality policy, considering the costs of all kinds of resources.

Although the model quality control system according to the ISO standards do not have branch pattern and applicable to organizations and companies that produce products and provide services in various areas, the specificity of education must necessarily be reflected in the interpretation of the text of the standard. The problem of creating an industry conformity assessment system becomes urgent – the branch system of certification of quality systems in higher education. A number of countries are already officially recognized certification system of educational institutions quality systems.

The whole process of provision of educational services is divided into major and minor manipulations.

The basic process begins with the moment when the student applies for the educational service continues throughout the period of education (the process of providing services) and ends with an evaluation of its results and the corresponding final event. But the basic process can be effective unless it is supported by auxiliary activities: reception, selection, staff training, the introduction of innovative educational technologies, market research, formation of organizational relationships support policies, document management and office administration, etc.

Based on the above, we can formulate a number of conclusions on the use of ISO standards in the higher school of Russia:

1. The implementation of quality systems on the model of ISO standards in Russian universities will improve the efficiency of their operations, ensuring the quality of the growth of educational services while reducing the costs of primary and secondary processes.
2. For open and distance learning systems it would be important to increase the level of employees' technological discipline, the creation of a system of regular internal quality audits and the increasing on their base level of executive

discipline, the increasing investment attractiveness and the creation of a new image of open and distance learning system.
3. The certification system in the field of education should be harmonized with those of the Russian systems of quality certification systems, international rules and standards in the education.

There are many approaches to the systems of assessing the quality of educational services, but, despite this, the issues related to the quality of educational processes, are still discussing.

European Organization for international accreditation ENQA developed seven principles of quality assurance:

1. Policy and quality assessment procedures,
2. Monitoring and periodic review of programs and awards.
3. Assessment of the level of students' knowledge,
4. Guarantee the quality of the teaching staff,
5. Resources for training and support students,
6. Information systems,
7. Public information.

The quality assurance of the educational process can be synthesized based on the following parameters:

- Content and structure of educational programs;
- The potential of scientific and teaching staff involved in the educational process;
- The potential of students;
- Ensure that the level of resources of the educational process, including innovative;
- Level of use of educational technology, including providing high professional competence;
- Management of educational systems and processes.

This model of education quality assurance aims to implement the following functions in the system of open and distance learning:

Leadership: Management structure, management responsibility.
Planning: Is mission and main goal, strategy, policy of quality education services.

Consumer Demand Management: Identification of users and their requirements of the education market requirements, monitoring of customers and customer satisfaction.

Processes to ensure resources management, education management, promotion of educational programs to consumers.

Personnel Management: Competence, professional development, well-being.

Quality control and evaluation of educational programs and services.

Information Management: Information environment, marketing, management and financial accounting.

Performance management, risk management and innovation.

Examinations and tests results can only be seen as internal and intermediate, which, at best, can give, although very useful and important, but it's still quite indirect and conditional.

«Success criteria» of the educational process can be classified into five main areas:

- Matching performance of goals and objectives (planned targets) of the educational institution, the current trend of employment and the needs of society;
- Available to consumers comprehensive information about the specialties and conditions of education;
- Adaptation of the educational process to changes in the demands and needs of clients, innovation in the educational process;
- Matching abilities of students to the level and possibilities of teachers;
- Common standards for all participants in the educational process.

The monitoring of quality used aggregated and deployed (detailed) evaluation system based on «success criteria».

Performance analysis is usually done in three ways: in comparison with other, in dynamics, compared with the target (planned) indicators.

An alternative approach to assessing the quality of education is «management approach», which proposes to use three groups of indicators:

- Efficiency (Cost Minimization),
- Effectiveness (achievement of objectives),
- Efficiency (optimization in relation to the resources used performance).

The feature of «management approach» is that different branches set their own criteria for assessing the quality of education and data collection and processing procedures and decision-making.

Since the concept of «education» extends to «education» as a result and to «education» as an educational process, education quality assurance involves managing every stage of the educational process.

The educational process can be represented as a system combining:

- Educational programs;
- Subjects of the educational process: teachers, organizing the process and trained, the formation of the process of education which aims;
- Resources of the educational process: the material-technical, laboratory and experimental, educational, computer – information, etc.;
- Set of educational technology;
- Methods of educational systems and process management.

The adoption of a new paradigm of quality assurance system of education should be a strategic decision of the senior management of a continuous and open learning system. It is necessary to identify the many interrelated areas of its operations and effectively implement their management, to a system of continuous and open learning function effectively. In terms of the process approach, the activity using resources, and managed in order to ensure the ability to transform «inputs» into «outputs», it is regarded as a single process system U = (u1, u2, … un), where un – some local process in system U .

The advantage of the process control approach is continuity; it provides that at the transition points between individual processes within the system of processes, and their combination and interaction. In addition, as a rule, the «output» from one process directly forms the «input» the next process.

Education system is a closed control loop, in which the demand for the quality of education plays a role of a regulator of educational activities and the introduction of innovative educational technologies. This situation defines the two main directions of its activity: on the one hand, meeting the demand of educational institutions on the necessary expertise, on the other, - the formation of proposals for businesses.

There are different ways of applying the above principles in the management of quality of education. It is possible to propose the following sequence of the introduction of innovative educational technologies:

- Diagnosis system in terms of capabilities at the lowest cost to change the educational process in accordance with the requirements of the labor market

and the design of new educational technologies, customized to the needs and abilities of each individual student;

- Analysis of the desirability of the development policy, the implementation of innovative educational technologies and evaluate: the risks of investing in the development and implementation of innovative educational technologies; payback periods; projected results to improve the quality of educational services; the effectiveness of the educational complex;
- On the basis of the data received for the diagnosis and analysis of the educational complex, - the development of strategies for the introduction of innovative educational technologies;
- The creation of a motivation system for all employees of innovative educational technologies;
- Establishment of quality evaluation system of educational services with the use of innovative educational technologies at every stage of its production;
- The creation of the analysis and evaluation of the educational complex competitiveness in the market of educational services;
- CONNECTING with educational complexes in other countries, exchange of students, studying the experience of foreign educational technologies.

To analyze the assessment of residual knowledge at every stage of the development of a methodology of material diagnostic analysis carried out by computer-based testing, and compares the statistical characteristics of the current and the reference level of knowledge.

Formation of reference parameters of the diagnostic tree is carried out on the basis of expert assessments:

- State educational standards;
- Licensing, certification and accreditation requirements state;
- Competencies of ministries and departments;
- Rating of educational institutions;
- Labor market (national and international).

All parameters of the diagnostic tree characterizing the quality of the educational process can be divided into two classes:

1. Parameters affecting the quality of the education students;
2. parameters affecting the quality of the educational process is continuous and open education system as a whole.

In the first case, there are three components of the quality of education:

- Quality educational content (knowledge, ways of solving problems, the availability of innovative educational technologies, for example, distance learning),
- Quality of the methods of training and education (the organization of cognitive activities, motivation of cognitive activity, monitoring of training activities, monitoring of learning outcomes),
- Quality of education of the person (the assimilation of knowledge and skills, assimilation of moral norms).

In accordance with these requirements is proposed a multi-level scheme of education the individual quality indicators.

In the second case, the analysis can be recommended for practical application of the following criteria of quality of the educational process:

- Availability of curriculum approved in the prescribed manner, the training process schedules, working on subjects programs;
- That the content of curricula and working programs requirements, the quality of programs and university Standards;
- Compliance timetables for teaching logic of each discipline;
- Completeness and sufficiency of methodical maintenance on disciplines (guidelines, lecture notes, laboratory works etc.);
- Sufficiency, regularity and high level of monitoring;
- The introduction in the educational process of innovative educational technologies.

For each parameter, the diagnostic tree can use the score in the range.

Quality Assurance in Distance Education with Big Data Technology and Intelligent Avatar-Based Systems

The digital era is characterized by the availability of huge amounts of information (big data), its storage, search and analysis tools. Any management decision should be based on the analysis of all data on the subject under consideration, which can be collected.

All systems start generating data, which can be combined to create a better picture and to observe the prospects of an individual. With the potential of Big Data to ascertain deeper insights for scientific decision-making process in the distance educational process.

Big Data as a Basis for Distance Education Quality Assurance

Big data analytics is now becoming a big challenge in the educational sphere. Institutions began to change their approach to management and began to focus on so-called "high involvement systems" (Hussein and Mohamed, 2015). The key principles for using analytics includes responsibility, transparency and consent, privacy, validity, access, minimizing adverse impacts, etc. (Martin and Thawabieh, 2017).

Success criteria of the educational process can be classified into five main areas:

- Matching performance of goals and objectives (planned targets) of the educational institution, the current trend of employment and the needs of society;
- Available to consumers comprehensive information about the specialties and conditions of education;
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An alternative approach to assessing the quality of education is «management approach», which proposes to use three groups of indicators:

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The feature of «management approach» is that different branches set their own criteria for assessing the quality of education and data collection and processing procedures and decision-making using Big Data and IoT technigues.

Big Data includes a new field of study analytics learning (Long and Siemen, 2011), which is already a growing field in education. Big data opens up new opportunities

and challenges for universities. Long and Simen (2011) indicated that "Big Data" is the most dramatic basis for effectively using a vast body of data and ultimately for shaping the future of higher education. The use of Big Data in higher education was also supported by Wagner and Ice (2012), who noted that technological developments certainly served as catalysts for promoting analytics in higher education.

An OECD (2013) report suggested that it may be the foundation on which higher education can reinvent both its business model and bring together the evidence to help make decisions about educational outcomes.

Model of Big Data Analytics in Higher Education

Learning analytics is concerned with measuring, collecting, analyzing and presenting data about learners and their contexts in order to understand and optimize learning and the external environments (Hussein, et al., 2019).

In a broader sense, software and analytics training methods are commonly used to improve processes and workflows, measure academic and institutional data, and generally improve organizational effectiveness (Ibe-Ariwa and Ariwa, 2015). Corporate and academic partnerships are growing. However, to attract and support these partnerships, corporations demand that higher education institutions demonstrate a commitment to using and developing advanced technologies that can support applied research and the potential for knowledge transfer and commercialization (Kellen et al., 2013).

Over the last decades, a digital revolution associated with developments in new technologies is radically reshaping the mode and accessibility of learning and teaching. "The world is becoming a mobigital virtual space where people can learn and teach digitally anywhere and anytime" (Şad and Göktaş, 2013, p. 606). Searching for solutions to the problem of free and mass access to high-quality training courses, regardless of the place of residence and student status has led to massive open distance learning courses MOOC that are implemented in the Internet environment. The widespread recognition of MOOC in the world has shown that the method of teaching requires an examination of their methodological foundations for the introduction of elements in intramural and remote learning process in Russian universities.

MOOC (Massive Open Online Course) is an emerging online platform for engaging the students from diversified locations in the country. MOOC based online learning platforms such as Coursera, Edx, Udacity, MiriadaX and IITBombayX are gaining the increasing number of student enrollment ratio on every year and for every course. Because of new web based technologies such as cloud computing and big data, the content creation cost of MOOC courses has been reduced, thus allows

MOOCs providers to make available their content for free to the learners located anywhere with internet access (Saravanan and Srinivasan, 2018).

From an organizational learning perspective, it is well known that institutional effectiveness and adaptation to change are based on an analysis of relevant data (Rowley, 1998). Also modern technologies allow institutions to obtain information from data with previously unattainable levels of complexity, speed and accuracy. As technology continues to penetrate all aspects of higher education, students, computer applications and systems generate valuable information.

There are many areas in which universities can benefit from using big data analytics. These include increased retention; providing better feedback for students; collect data on attendance and improve teaching and learning and contain costs. If data can be used so effectively to improve student learning, reduce the time until graduation, the question arises whether it can also be used to improve the quality of education.

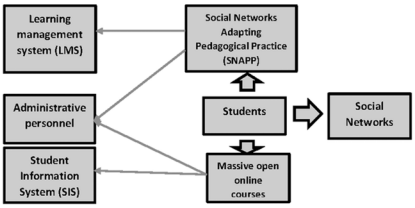
Big Data analytics in higher education can be divided into two categories (Farokhmehr and Seyed, 2016). Learning analytics focus on capturing student behavior and correlating it to achieving learning objectives, while academic analytics tries to design predictive analytics for student attainment (Morabito, 2015).

In Learning analytics the student's journey includes, but is not limited to getting study materials, preparing and submitting assignments, engaging with e-tutors and e-mentors, engaging with a range of learning facilitators via the LMS through discussions groups and blogs, uploading assignments as they prepare for examinations and digitized learning activity indicators such as attendance (Sultan and Mukthar, 2017).

Learning analytics is concerned with the measurement, collection, and analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs (Sultan and Mukthar, 2017). Learning analytics, such as Social Networks Adapting Pedagogical Practice (SNAPP), can be deployed to analyze this unstructured data. SNAPP is a software tool that allows users to visualize the network of interactions resulting from discussion forum posts and replies. On the other hand, Academic analytics incorporated a variety of demographic data is captured at registration about the student, including attributes such as gender, ethnicity, age and educational background, which can be used by researchers to create student profiles linked to success indicators such as exam success, graduation, employment and student retention (Ben, 2017). Academic analytics gives information that managers can use to support the strategic decision-making process and development benchmarking strategies for measuring the quality of education in different institutions (Fig. 3).

Teachers, students and staff in the university will benefit from the use of Big Data technology in many ways:

Figure 3. Interrelations between the key elements of learning management system



1. *Create data about students' learning behaviors* that potentially is a powerful measuring tool of tutors' performance. Advanced text analytics can help like natural language processing tools (NLP's) that work with Arabic. Using advanced analytics tools, governments can help schools improve online courses and more deeply assess educational gaps by evaluating social media (Sultan and Mukthar, 2017). Big data can help institutions enrich learning process and boost student performance through the panel, decrease dropout rates and rise students success rate (Ben, 2017).
2. *Curriculum improvement through the analysis of big data*. Educators can determine weaknesses in student learning and comprehension to understand whether or not improvements to the curriculum may prove necessary. Instructors can engage in educational strategic planning to ensure that the learning curriculum targets student needs to maximize learning potential (Nunn, et al., 2016). The core of big data is forecasting, which applies mathematical algorithm to predict the probability of future events.
3. *Enhancing the research opportunities in higher education and knowledge exchange between the science and industry.* Big data influences scientific research on higher education in two aspects: one can refer to books and materials more quickly. Another one is that it provides means of communication between research institutions or experts and scholars in higher education, which is more timely than directly using of books and materials with two-way communication of words, pictures(graphics), sounds and other multimedia at the same time, thus makes effective sharing of vast data possible. Big data era has changed greatly. It is possible to launch research collaboration global, interdisciplinary and on a large scale, share resources and collaborative work across obstacles temporally and spatially. This will change ways and modes for scientists engaging in scientific research, and help them promote their exchanges and cooperation greatly (Meng and Meng, 2014). It also provides scholars and researchers with needed information to identify gaps between education and

industry so that educators and institutions can overcome these deficiencies in course offerings (Nunn, et al., 2016).

The use of Big Data and IoT technologies in university's management practices has many outcomes (Fig. 4).

Process outcomes:

- Better tools for collecting, processing, analysing and interpretation of data;
- Better data system interoperability and system linking;
- enhanced data analytics and predictive modelling;
- Better real-time rendering of analytics on students and instructors performances;
- Reliable and comparable performance indicators and metrics within departments and divisions;
- Better utilisation of historical institutional data to make informed decisions;
- Better ability to develop and utilise "what if" scenarios for exploring data to predict possible outcomes (Daniel, 2014).

Artificial Intelligence Solutions for Increasing the Quality of Distance Education

It is obvious that without computer programs of artificial intelligence (AI) it is impossible to deal with large volumes of data.

Machine learning is a fundamental concept of artificial intelligence that focuses on the progressive improved performance of a computer for a specific task through its ability to "learn" with data. In educational sphere, machine learning can be used to analyze large data sets, as the ones that derive from social networks, SIS systems, MOOCs, SNAP, etc., and can lead to algorithms with predictive value. The main machine learning categories are supervised and unsupervised learning (Perakakis

Figure 4. Big Data analytics outcomes (Daniel, 2014)

et al., 2018). In supervised learning, the algorithm is provided with inputs (e.g. omics data) corresponding to specific outputs (e.g. presence of a disease or not), where the information is used to develop a general rule that will link the input to the output. In unsupervised learning, no information is provided, and the algorithm has to train all possible scenarios and find the structure linking the input to the output. Additionally, there are several intermediate categories of machine learning such as the semi-supervised learning, where the algorithm is provided with a limited amount of information, i.e. input data can be much more than the labeled outputs, which is often the case in multi-omics studies. Machine learning tasks typically include: a) dimensionality reduction to reduce the input mass by decreasing the number of random variables under consideration, b) clustering-classification to organize different variables of the input in groups with common characteristics, c) density estimation to assess distribution of input variables in specific space, and d) regression to estimate the relationships among variables and for developing predictive models (Perakakis et al., 2018).

Artificial Intelligence may have a great influence on teaching, learning, and higher education organization and governance. Implications and possibilities of these technological advances can already be seen. Recent advancements in artificial intelligence are opening new possibilities to rethink the role of the teacher, or make steps towards the replacement of teachers with teacher-robots (*Popenici and Kerr, 2017*). Providing affordable solutions to use brain computer interface (BCI) devices capable to measure when a student is fully focused on the content and learning tasks (*Popenici and Kerr, 2017*) is already possible, and super-computers, such as IBM's Watson, can provide an automated teacher presence for the entire duration of a course. The possibility to communicate and command computers through thought and wider applications of AI in teaching and learning represents the real technological revolution that will dramatically change the structure of higher education across the world. Personalized learning with an avatar can be adopted for blended delivery courses or fully on-line courses. Teacherbot computing solutions for the administrative part of teaching, dealing mainly with content delivery, basic and administrative feedback and supervision are already presenting as a disruptive alternative to traditional teaching assistants (*Popenici and Kerr, 2017*).

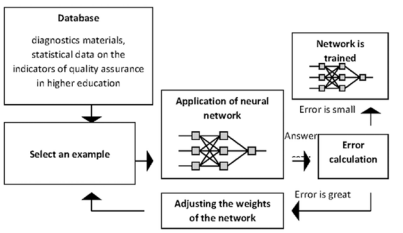
Intelligent data analysis includes the study of large amounts of data and search for patterns in them using statistical methods, artificial intelligence, as well as some database management technologies. In general, the goal of data mining is either classification or forecasting. When classification is required to distribute data by groups. When forecasting is determined by the likely value of continuous (i.e. non-discrete) variable.

There are some typical algorithms used in data mining.

- Classification trees. This is a popular method of data mining, used to categorize a categorical dependent variable based on measurements of one or more forecast variables. The result is a tree with nodes and links between nodes that can be used to form the "if-then" rules.
- Logistic regression. This is a statistical method, which is a variant of the standard regression, but it also provides a classification. The logistic regression formula predicts the probability of
- the emergence of the state as a function of independent variables.
- Neural networks. This is a software algorithm that models the parallel architecture of the animal's intelligence. The network consists of input nodes hidden layers and output nodes. Each unit is assigned a weight. Data are provided to the input node, then, by trial and error, the algorithm adjusts weight to meet certain limit criteria. Sometimes this approach is called the "black box" because its internal processes may not be observable.

An artificial neural network is a parallel computing system consisting of a large number of elementary information processing units - neurons that accumulate experimental knowledge and provide them for further processing. The term "training" refers to the ability of the National Assembly to obtain a reasonable result based on data that was not encountered in the learning process. The sequence of learning based on the back-propagation procedure in accordance with (Wassermen, 1992) is presented in Fig. 5. This property is used when implementing a hybrid fuzzy neural (NNS).

Figure 5. Scheme of training NNS to predict changes in the quality assurance of distance education system



CONCLUSION

The article formulates the principles of quality assurance education based on the concept of TQM, recommendations on the application of the latest information technologies to improve the quality assurance of educational processes of distance education system. The task of machine learning of artificial intelligence systems is a separate problem. The most appropriate and efficient way is to create universal "avatars" (Mkrttchian, 2011, 2012, 2015, Mkrttchian, et al., 2014, 2015) focused on solving a wide range of assessment tasks gradually in the course of step-by-step use for many projects. Avatars should become the core of the intelligent distance education system which should replace traditional expert systems.

"Intelligent" avatars working with large volumes of data are confronted with the problem of the composition of used information, the volumes of which is constantly growing. In addition, if there is a series of avatars that are focused on solving slightly different tasks, they must exchange data. The solution to both problems can be the use of blockchain technologies. The blockchain organization of distributed data storage about distance education systems creates a flexible and efficient knowledge base used by avatars when processing information.

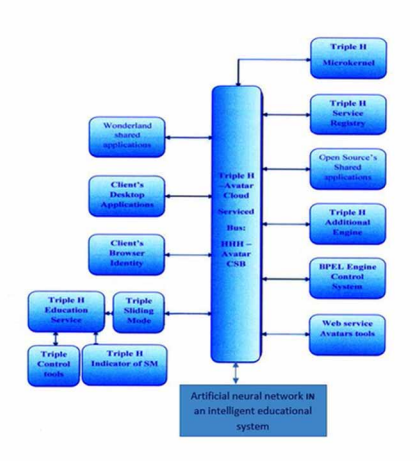
Considering the intelligent distance education system as a dynamic, time-developing system, one can speak of the underlying computer imitation model that has an independent theoretical and practical value. External information sources, blockchain-knowledge base, external stakeholders and the software environment uniting all these elements are in constant nontrivial interaction, the result of which cannot be predicted theoretically, but can be obtained as a result of computer imitation. In addition to direct application for educational quality management system's evaluation, the simulation model can be used to solve a much wider range of tasks: forecasting, risk assessment, rating of courses, individual teachers, and even universities.

As a result of conducted research the authors present the model of intelligent avatar-based distance education system (Fig. 6)

An intelligent avatar-based distance education system is a cloud platform and distance learning environment. To implement the cloud approach, the Xen hypervisor and Eucalyptus cloud IaaS platform are used to provide load sharing between virtual machines, add and remove cluster resources from use, and other cloud-based educational "platform as a service" (PaaS); features of the student audience and, as a rule, the limited capabilities of IT specialists of universities, maxim

Aticle forally simplifying the processes of access and use of the solution, as well as its administrator, extension and maintenance. On the device, only a browser is needed, so that users do not need to acquire special skills to work with the system,

Figure 6. Model of the intelligent avatar-based distance education system



and administrators need only control the centralized cloud part of the solution, since no software updates are required on client workstations.

In conclusion, the main performance outcomes of proposed model implementation in higher education institutions are:

- Better understanding of the requirements for effective data preparation for analytics;
- Solid foundation for the utilisation of Big Data;
- Improved standardised and streamlined data processes;
- Consistent ways to effectively leverage data analytics for improved accuracy, deeper knowledge and real time decision making;
- Better data-driven decision making and practice;
- Foundation for hypothesis testing, web experimenting, scenario modelling, simulation, sensibility and data mining;
- Foundation for forecasting, risk assessment, rating of courses, rating of individual teachers, and individual institutions.

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