

Social Customer Relationship Management (Social-CRM) in the Era of Web 4.0



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Social Customer Relationship Management (Social–CRM) in the Era of Web 4.0

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A volume in the Advances in
Marketing, Customer Relationship
Management, and E-Services
(AMCRMES) Book Series



Published in the United States of America by

IGI Global

Business Science Reference (an imprint of IGI Global)

701 E. Chocolate Avenue

Hershey PA, USA 17033

Tel: 717-533-8845

Fax: 717-533-8661

E-mail: cust@igi-global.com

Web site: <http://www.igi-global.com>

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Library of Congress Cataloging-in-Publication Data

Names: Ammari, Nedra Bahri, 1973- editor.

Title: Social customer relationship management (Social-CRM) in the era of Web 4.0 / Nedra Bahri Ammari, editor.

Description: Hershey, PA : Business Science Reference, [2022] | Includes bibliographical references and index. | Summary: "This book is for those who wish to improve their understanding of the strategic role of marketing 2.0, digital customer experience and social customer relationship management on social networks and the importance of social networks to build loyalty in the web 4.0 era"-- Provided by publisher.

Identifiers: LCCN 2021051911 (print) | LCCN 2021051912 (ebook) | ISBN 9781799895534 (hardcover) | ISBN 9781799895541 (paperback) | ISBN 9781799895558 (ebook)

Subjects: LCSH: Customer relations--Management. | Social media--Economic aspects.

Classification: LCC HF5415.5 .S62173 2022 (print) | LCC HF5415.5 (ebook) | DDC 658.812--dc23/eng/20211215

LC record available at <https://lcn.loc.gov/2021051911>

LC ebook record available at <https://lcn.loc.gov/2021051912>

This book is published in the IGI Global book series Advances in Marketing, Customer Relationship Management, and E-Services (AMCRMES) (ISSN: 2327-5502; eISSN: 2327-5529)

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material.

The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.



Advances in Marketing, Customer Relationship Management, and E-Services (AMCRMES) Book Series

ISSN:2327-5502
EISSN:2327-5529

Editor-in-Chief: Eldon Y. Li, National Chengchi University, Taiwan &
California Polytechnic State University, USA

MISSION

Business processes, services, and communications are important factors in the management of good customer relationship, which is the foundation of any well organized business. Technology continues to play a vital role in the organization and automation of business processes for marketing, sales, and customer service. These features aid in the attraction of new clients and maintaining existing relationships.

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The Advances in Marketing, Customer Relationship Management, and E-Services (AMCRMES) Book Series (ISSN 2327-5502) is published by IGI Global, 701 E. Chocolate Avenue, Hershey, PA 17033-1240, USA, www.igi-global.com. This series is composed of titles available for purchase individually; each title is edited to be contextually exclusive from any other title within the series. For pricing and ordering information please visit <http://www.igi-global.com/book-series/advances-marketing-customer-relationship-management/37150>. Postmaster: Send all address changes to above address. Copyright © 2022 IGI Global. All rights, including translation in other languages reserved by the publisher. No part of this series may be reproduced or used in any form or by any means – graphics, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems – without written permission from the publisher, except for non commercial, educational use, including classroom teaching purposes. The views expressed in this series are those of the authors, but not necessarily of IGI Global.

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Senthan Prasanth, Sabaragamuwa University of Sri Lanka, Sri Lanka

B. T. G. S. Kumara, Sabaragamuwa University of Sri Lanka, Sri Lanka

Customer profitability is one of the most critical problems faced by businesses today. Keeping an existing customer is more valuable than gaining a new subscriber in the telecommunication industry. As a result, anticipating customer attrition behavior in advance is challenging. This behavior has prompted most researchers to establish a model for categorizing clients based on their profitability levels in various businesses. This study was carried out with the assistance of a local telecommunication service provider. Approximately 10,000 pre-paid subscriber details with 12 attributes were acquired. Furthermore, the classification technique was used to reduce the dimensionality between features and classify the high profitable customers, low profitable customers, and average profitable customers. The data was then fed into various supervised learning algorithms to choose the optimum algorithm by considering certain evaluation metrics for developing the final prediction model. The proposed approach revealed that the SVM outperformed all other techniques with greater accuracy of 80.00%.

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Website Usability, Website Interactivity, and Website Personality as Drivers of Online Purchase26

Yosra Akrimi, Sfax University, Tunisia

Romdhane Khemakhem, Sfax University, Tunisia

Having a website is no longer an option for businesses but a necessity in the new digital economy. To meet this challenge, companies must design websites facilitating electronic transactions and retaining customers. Hence, companies need to know and focus on the key triggers that drive consumers to buy online. This chapter sheds light on the effects of three fundamental website features on online shopping. Website usability, website interactivity, and website personality describe the evolution of website design. Website design has changed to become more responsive and efficient. To develop their first websites, companies focused on usability and ease of use. Website usability aims to strengthen the user's perceived control and facilitate online shopping. The expectations of online shoppers have evolved by requiring a highly captivating and engaging online experience. Therefore, companies tried to meet those expectations by developing interactive and playful websites. To stand out from the competition, companies rely on symbolism and website personality.

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A Conceptual Framework of the Challenges and Benefits of Social Customer Relationship Management.....48

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Salalah, Oman

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Recent years have witnessed a significant change in the experiences and interactions of customers in various industries due to the remarkable development and the significant impact of information technology and social media on consumer behaviour. This prompted all organisations to focus on social customer relationship management (Social CRM) which is mainly aiming at personalising such experiences and interactions. Despite the notable evolution in social CRM scientific research, however, limited attention has been paid to clearly demonstrate the essential influencers and challenges of social CRM as well as its associated benefits for businesses. To this end, the current work aims to provide a deeper understating in relation to social CRM and its related key challenges and benefits. This research develops an integrated theoretical framework of the major challenges and benefits to adopting social CRM, leading to substantial theoretical and practical contributions to concerned entities.

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Value is a fundamental concept in relationship marketing (RM). The company's ability to create value for its customers is seen as the most successful competitive strategy. The effervescence created by this subject in the scientific community and the diversity of proposed meanings and approaches have led to a theoretical confusion around this concept. In this chapter, the authors tried to study the concept of value through an extensive and eclectic literature review. They particularly attempted to focus on the perceived side of this concept, as the customer point of view is the primary concern for companies that are marketing oriented. The developments lead us to consider the customer-supplier relationship as a source of enrichment for the concept of perceived value. From there, it is better to talk in RM about "perceived relationship value" (PRV) rather than "perceived value." PRV is then presented as a key integrative concept to build a successful customer-supplier relationship.

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The hospitality sector is a big contributor to the Indian economy. According to a recent report by KPMG, the Indian hospitality industry is projected to grow at 16.1% CAGR to reach Rs 2,796.9 thousand crore in 2022. The hospitality sector provides jobs to a large number of people and defines a service sector which is growing in popularity with an increase in incomes across the middle class and an increasing desire to indulge in entertainment and related activities. This chapter details the factors influencing consumer expectations from the service industry and helps in understanding the usage of social media to manage customer expectations and perceptions of quality. It also aims at identifying ways to use social media to plug service quality gaps and increase consumer loyalty. The chapter also explores the appropriate advertising appeals that should be used by the hospitality industry on social media.

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Environmental Sustainability, Value Co-Creation, and Innovation in Service Industries With the Lens of S-D Logic 128

Inci Polat, Suleyman Demirel University, Turkey

Businesses have recently shifted their attention to service innovation as a new economic justification for addressing environmental sustainability issues. Sustainable innovations may help businesses embrace solutions in new ways and can help firms grow and improve existing business models in ways that decrease social and environmental consequences while also adding new advantages and features. Businesses that adopt environmental sustainability in innovative processes can positively increase their opportunities to be innovative leaders in related fields. This acts as a link to win business competition around innovative approaches to environmental sustainability. In this context, the study aims to contribute to the role of environmental sustainability, value co-creation, and service innovation in service industries with an S-D logic perspective. From an S-D logic viewpoint, the study also investigates the extent to which service innovation and value co-creation may contribute to environmental sustainability.

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Leila Othmani, FSEGT, Tunisia

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Despite the development of social networks and virtual communities, there is no specific scale measuring the perceived quality of a virtual community. This research is part of this perspective and attempts to propose a scale to measure the perceived quality of a virtual community. To achieve the objective, a qualitative study was carried out with the technique of “brain writing” for the generation of items and a quantitative study with 343 members of virtual communities was conducted. The results show that the perceived quality of a virtual community is a multidimensional concept and confirms validity and reliability.

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Data Mining for CRM: Extracting Customer Knowledge From Data 169

Latifa Trabelsi, Higher Institute of Technological Studies of Bizerte, Tunisia

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The growth of existing customers' database made by the availability of a large volume of customer data and modern information technologies make the use of data mining tools both a necessity and an opportunity. Several research studies have drawn

attention to the interest of applying knowledge discovery in data (KDD) and data mining methods to extract customer knowledge. These methods would improve the customer knowledge management (CKM) process and equip decision-makers with better knowledge about their customers to better serve them. The purpose of this paper is to show customer relationship (CRM) process steps and related objectives with appropriate data mining methods and techniques for better marketing decision making.

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Deep Learning Approach for Detecting Customer Churn in
Telecommunication Industry 196

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In today’s business world, customer turnover is a significant problem. Communications companies aren’t exempt from these problems. Retaining consumers is more important than recruiting new ones when it comes to business. Getting new clients is about five times as expensive as keeping old ones in this field. As a result, anticipating client turnover is a huge challenge for almost all organizations. This study focused on analyzing information on around 7000 post-paid subscribers by considering 21 different attributes. Initially, the data was fed into machine learning techniques such k-nearest neighbors, artificial neural networks, etc. In addition, deep neural networks (DNN) have also considered more than one hidden layer. A total of 4284 of the 7234 post-paid customers are considered non-churners, while the remaining 2950 are churners. The long short-term memory networks (LSTM) considered under the DNN produce results far superior to the other techniques, with the highest accuracy rate of 82.46%. Finally, the LSTM method was used to create the final prediction model.

Chapter 10

Customer Journey Redefined: Social-CRM and Beyond.....216

N. Meltem Çakıcı, Beykent University, Turkey

The rising popularity of social media has added a new challenge that companies are facing today since they can hardly manage the information that is shared about their products and brands among the members of these social platforms. Customer relationship management strategy, in this respect, has transformed into social-CRM through which the social media channels are integrated with the CRM tools. This significant change in companies’ interactions with customers demands not only different ways of doing business but also managerial commitment, participatory human resources, and technological infrastructure. The are multiple objectives of

this chapter. Firstly, the aim is to provide detailed information about social-CRM and its differences from the traditional CRM. Secondly, how social-CRM affects consumers' changing roles during their purchase journeys and helps firms in creating personalized experiences for customers will be explained. Finally, what social-CRM demands from managers and how they can develop strategies based on this new CRM orientation will be discussed.

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Social Customer Relationship Management (S-CRM)228

Ruchika Sharma, REVA University, India

Anshu Rani, REVA University, India

Megha Kumar, REVA University, India

Shiffu Abrol, MIET, India

Customer relationship management (CRM) has evolved significantly in recent years, from a strategy that focused exclusively on developing financial links with clients to one that fosters both transactional and interactional interactions. As a result, a new type of CRM called social customer relationship management (SCRM) or CRM 2.0 has emerged. This research presents and builds a conceptual model to address the connections between customer relationship management, social media technologies, customer engagement, positive word of mouth, and brand loyalty. Adding to the conventional relevance of customer relationship management, this study presents how Social CRM has become the need of the hour. This research would be helpful to both service and product-based organisation. A conceptual model has been developed to show how social media technologies lead to both positive word of mouth and brand loyalty. SCRM (social customer relationship management) is a new paradigm that influences customer-organization relationships by allowing customers to govern the connection via social media.

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Social Network Customer Relationship Management for Orchestras: A Case Study on Hong Kong Philharmonic Orchestra250

Jiaming Wang, The University of Hong Kong, Hong Kong

Suming Deng, The University of Hong Kong, Hong Kong

Dickson K. W. Chiu, The University of Hong Kong, Hong Kong

Cheuk Ting Chan, Independent Researcher, Hong Kong

The COVID-19 pandemic and quarantine policies have caused the Hong Kong Philharmonic Orchestra (HKPhil) to significantly reduce offline concerts and ticket revenue, while increasing reliance on government funding. With the advancement of internet and mobile technologies, social media greatly help disseminate information and connect to customers. Thus, this study investigates HKPhil's social customer relationship management (CRM) by surveying its website and social media.

Quesenbery’s 5Es usability model was used to analyze the orchestra’s social media usability and the 7Ps marketing mix model to explore the current opportunities and risks faced by HKPhil. The findings indicate the limitations of HKPhil’s current approach to social CRM and suggest changing concert formats, enhancing social network promotions, and providing online education resources to help HKPhil attract a wider audience of different age groups. Scant studies focus on orchestras in East Asia, and this study offers some social CRM development strategies and actionable recommendations.

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Preface

This book, *Social Customer Relationship Management (Social-CRM) in the Era of Web 4.0*, extends the literature on social customer relationship management during the dynamic times of evolving information and internet. The advent of Web 2.0 has led to a rebalancing of power between the customer and the company through the consumer's voice about the brand and referral behavior via electronic word of mouth. Customer opinions within the virtual brand communities can have a vast impact on a company's sales and image. It is crucial for companies to promote and use customer contributions in order to enhance their brand image, retain customers, and develop their marketing strategy.

Social Customer Relationship Management in the Era of Web 4.0 provides relevant theoretical frameworks and the latest results of empirical research on the strategic role of marketing 2.0, digital customer experience, and social customer relationship management on social networks. Covering a range of topics such as disruptive marketing, artificial intelligence, and customer behavior, this reference work is ideal for marketers, IT practitioners, CRM specialists, industry professionals, researchers, scholars, practitioners, academicians, instructors, and student.

Contributing a book about different aspects and dimensions of social customer relationship management in the era, when the internet is attempting to touch higher levels of intelligence, has been educative and informative. The elements of the book focus on a number of aspects, like:

- Artificial Intelligence
- Customer Behavior
- Customer Value Management
- Digital Customer Experience
- Robots
- Social Customer Relationship Management
- Value Creation
- Virtual Communities
- Customer Journey and Social Customer relationship management

- Environmental sustainability

The books offers a boutique of chapters on Social Customer Relationship Management, which are briefed as following:

A MACHINE LEARNING APPROACH TO CLASSIFY THE TELECOMMUNICATION CUSTOMERS BASED ON THEIR PROFITABILITY

This chapter discusses the importance of customer profitability as one of the most critical issues facing businesses today. Keeping an existing customer is more valuable than gaining a new subscriber in the telecommunication industry. As a result, anticipating customer attrition behavior in advance is challenging. This behavior has prompted most researchers to establish a model for categorizing clients based on their profitability levels in various businesses. This study was carried out with the assistance of a local telecommunication service provider. Approximately 10,000 pre-paid subscriber details with 12 attributes were acquired. Furthermore, the classification technique was used to reduce the dimensionality between features and classify the High Profitable customers, Low Profitable customers, and Average Profitable customers. The data was then fed into various supervised learning algorithms to choose the optimum algorithm by considering certain evaluation metrics for developing the final prediction model. The proposed approach revealed that the SVM outperformed all other techniques with greater accuracy of 80.00%.

WEBSITE USABILITY, WEBSITE INTERACTIVITY, AND WEBSITE PERSONALITY AS DRIVERS OF ONLINE PURCHASE

Having a website is no longer an option for businesses but a necessity in the new digital economy. To meet this challenge, companies must design websites facilitating electronic transactions and retaining customers. Hence companies need to know and focus on the key triggers that drive consumers to buy online. This chapter sheds light on the effects of three fundamental website features on online shopping. Website usability, website interactivity, and website personality describe the evolution of website design. Website design has changed to become more responsive and efficient. To develop their first websites, companies focused on usability and ease of use. Website usability aims to strengthen the user's perceived control and facilitate online shopping. The expectations of online shoppers have evolved by requiring a highly captivating and engaging online experience. Thus, the chapter suggests that

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companies tried to meet those expectations by developing interactive and playful websites. To stand out from the competition, companies rely on symbolism and website personality.

A CONCEPTUAL FRAMEWORK OF THE CHALLENGES AND BENEFITS OF SOCIAL CUSTOMER RELATIONSHIP MANAGEMENT

The chapter underpins on the recent changes in the experiences and interactions of customers in various industries due to the remarkable development and the significant impact of information technology and social media on consumer behavior. Such experiences prompted all organizations to focus on social customer relationship management (Social CRM) which is mainly aiming at personalizing such experiences and interactions. Despite the notable evolution in social CRM scientific research, however, limited attention has been paid to clearly demonstrate the essential influencers and challenges of social CRM as well as its associated benefits for businesses. To this end, the chapter aims to provide an in-deeper understating in relation to social CRM and its related key challenges and benefits. This chapter develops an integrated theoretical framework of the major challenges and benefits to adopting social CRM, leading to substantial theoretical and practical contributions to concerned entities.

TOWARDS INTEGRATING THE CUSTOMER-SUPPLIER RELATIONSHIP IN PERCEIVED VALUE CONCEPTUALIZATION

This chapter focuses on value as a fundamental concept in Relationship Marketing, as the company's ability to create value for its customers is seen as the most successful competitive strategy. The subject requires attention as the effervescence created in the scientific community and diversity of proposed meanings and approaches have led to a theoretical confusion. The authors have attempted to study the concept of value through an extensive and elective literature review. They particularly attempt to focus on the perceived side of this concept, as the customer point of view is the primary concern for companies that are marketing oriented. The developments lead authors to consider the customer-supplier relationship as a source of enrichment for the concept of perceived value. From that point, the authors suggest to talk in relationship management about "perceived relationship" rather than "perceived value". The chapter presents perceived relationship value as a key integrative concept to build successful customer-supplier relationship.

USING SOCIAL MEDIA TO MANAGE CUSTOMER EXPECTATIONS AND QUALITY PERCEPTIONS IN THE HOSPITALITY INDUSTRY

The chapter focuses on the determinants of social media use by the hospitality industry. The Hospitality sector is a big contributor to the Indian economy. According to a recent report by KPMG, the Indian hospitality industry is projected to grow at 16.1 per cent CAGR to reach Rs 2,796.9 thousand crore in 2022. The hospitality sector provides jobs to a large number of people and defines a service sector which is growing in popularity with an increase in incomes across the middle class and an increasing desire to indulge in entertainment and related activities. This chapter details the factors influencing consumer expectations from the service industry and helps in understanding the usage of social media to manage customer expectations and perceptions of quality. It also aims at identifying ways to use social media to plug service quality gaps and increase consumer loyalty. The chapter also explores the appropriate advertising appeals that should be used by the hospitality industry on social media.

ENVIRONMENTAL SUSTAINABILITY, VALUE CO-CREATION, AND INNOVATION IN SERVICE INDUSTRIES WITH THE LENS OF S-D LOGIC

This chapter highlights the recent shift in attention of businesses towards service innovation as a new economic justification for addressing environmental sustainability issues. Sustainable innovations may help businesses embrace solutions in new ways, and can help firms grow and improve existing business models in ways that decrease social and environmental consequences while also adding new advantages and features. Businesses that adopt environmental sustainability in innovative processes can positively increase their opportunities to be innovative leaders in related fields. This acts as a link to win business competition around innovative approaches to environmental sustainability. In this context, the chapter stresses the role of environmental sustainability, value co-creation, and service innovation in service industries with an S-D logic perspective. From an S-D logic viewpoint, this chapter also investigates the extent to which service innovation and value co-creation may contribute to environmental sustainability.

DEFINING AND MEASURING THE PERCEIVED QUALITY OF A VIRTUAL COMMUNITY

This chapter aims to propose a scale to measure the perceived quality of a virtual community. Despite the development of social networks and virtual communities, no specific scale measuring the perceived quality of virtual community. This chapter brings a qualitative study with 343 members of virtual communities as participants. The results show that perceived quality of a virtual community is a multidimensional concept and confirms validity and reliability.

DATA MINING FOR CRM: EXTRACTING CUSTOMER KNOWLEDGE FROM DATA

This chapter highlights the growth of existing customers' database and modern information technologies making data mining tools both a necessity and opportunity. Literature indicates that application of Knowledge Discovery in Data (KDD) and data mining methods to extract customer knowledge are gaining attention. These methods would improve the Customer Knowledge Management (CKM) process and equip decision-makers with better knowledge about their customers to better serve them. The chapter highlights the Customer Relationship Management (CRM) process' steps and related objectives with appropriate data mining methods and techniques for better marketing decisions.

DEEP LEARNING APPROACH FOR DETECTING CUSTOMER CHURN IN THE TELECOMMUNICATION INDUSTRY

This chapter discusses the concern on customer turnover and customer retention in context of communications companies. In today's business world, customer turnover is a significant problem. Communications companies aren't exempt from these problems. Retaining consumers is more important than recruiting new ones when it comes to business. Getting new clients is about five times as expensive as keeping old ones in this field. As a result, anticipating client turnover is a huge challenge for almost all organizations. This chapter focuses on analyzing information on around 7000 post-paid subscribers by considering 21 different attributes. Initially, the data was fed into machine learning techniques such K-Nearest Neighbors, Artificial Neural Networks etc. In addition, Deep Neural Network (DNN) have also considered more than one hidden layer. A total of 4284 of the 7234 post-paid customers are considered non-churners, while the remaining 2950 are churners. The Long Short-

Term Memory Networks (LSTM) considered under the DNN produce results far superior to the other techniques, with the highest accuracy rate of 82.46%. Finally, the LSTM method was used to create the final prediction model.

CUSTOMER JOURNEY REDEFINED: SOCIAL-CRM AND BEYOND

This chapter indicates the rising popularity of social media has added a new challenge for those companies that can hardly manage the information that is shared about their products and brands among members of these social platforms.

Customer relationship management strategy, in this respect, has transformed into social-CRM through which the social media channels are integrated with the CRM tools. This significant change in companies' interactions with customers' demands not only different ways of doing business but also managerial commitment, participatory human resources, and technological infrastructure. This book chapter contributes via multiple objectives. Firstly, the aim is to provide detailed information about social-CRM and its differences from the traditional CRM. Secondly, how social-CRM affects consumers' changing roles during their purchase journeys and helps firms in creating personalized experiences for customers will be explained. Finally, what social-CRM demands from managers and how they can develop strategies based on this new CRM orientation will be discussed.

SOCIAL CUSTOMER RELATIONSHIP MANAGEMENT (S-CRM)

This chapter brings in new type of customer relationship management called social customer relationship management. The chapter presents and builds a conceptual model to address the connections between customer relationship management, social media technologies, customer engagement, positive word of mouth, and brand loyalty. Adding to the conventional relevance of Customer relationship management, this chapter presents how social customer relationship management has become the need of the hour. A conceptual model has been developed to show how, social media technologies lead to both positive word of mouth and brand loyalty. The chapter suggests Social customer relationship management as a new paradigm that influences customer organization relationships by allowing customers to govern the connection via social media.

SOCIAL NETWORK CUSTOMER RELATIONSHIP MANAGEMENT FOR ORCHESTRAS: A CASE STUDY ON HONG KONG PHILHARMONIC ORCHESTRA

This chapter addresses the issue of social CRM in the Asian context and specifically for East Asian orchestras. The COVID-19 pandemic and quarantine policies have caused the Hong Kong Philharmonic Orchestra (HKPhil) to significantly reduce offline concerts and ticket revenue, while increasing reliance on government funding. With the advancement of Internet and mobile technologies, social media greatly help disseminate information and connect to customers. Thus, this study investigates HKPhil's social customer relationship management (CRM) by surveying its website and social media. Quesenbery's 5Es usability model was used to analyze the orchestra's social media usability and the 7Ps marketing mix model to explore the current opportunities and risks faced by HKPhil. Our findings indicate the limitations of HKPhil's current approach to social CRM and suggest changing concert formats, enhancing social network promotions, and providing online education resources to help HKPhil attract a wider audience of different age groups. Scant studies focus on orchestras in East Asia, and this study offers some social CRM development strategies and actionable recommendations.

The chapters of this book provide insights on the practical aspect of Web 4.0 on business philosophy, marketing decisions, collective intelligence, customer journey, relationship marketing and challenges in customer social marketing.

We hope this book about social customer relationship management enthralls and motivates future research and experiments. While there are concerns over how the future of internet would evolve along the continuum of augmented reality, metaverse and analytics, we are reassured that this book would be a valuable contribution in the literature of social customer relationship management.

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Chapter 1

A Machine Learning Approach to Classify the Telecommunication Customers Based on Their Profitability


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ABSTRACT

Customer profitability is one of the most critical problems faced by businesses today. Keeping an existing customer is more valuable than gaining a new subscriber in the telecommunication industry. As a result, anticipating customer attrition behavior in advance is challenging. This behavior has prompted most researchers to establish a model for categorizing clients based on their profitability levels in various businesses. This study was carried out with the assistance of a local telecommunication service provider. Approximately 10,000 pre-paid subscriber details with 12 attributes were acquired. Furthermore, the classification technique was used to reduce the dimensionality between features and classify the high profitable customers, low profitable customers, and average profitable customers. The data was then fed into various supervised learning algorithms to choose the optimum algorithm by considering certain evaluation metrics for developing the final prediction model. The proposed approach revealed that the SVM outperformed all other techniques with greater accuracy of 80.00%.

DOI: 10.4018/978-1-7998-9553-4.ch001

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INTRODUCTION

A key strategic objective of many companies has been to find ways to improve customer satisfaction that directly impact on company's income and revenue. Companies can obtain customer profitability from serving a customer or customer base for a specific period. Understanding customers' profitability is the most critical factor for an organization to make strategic decisions to make the company a stable position and maintain its reputation (Mulhern, 1999).

Information and communication have significantly changed smartphones instead of fixed-line telephones. The communication medium changed from traditional calls and text messages to alternatives such as Skype, Zoom, Google Duo, and social media. Today's status of the telecommunication industry in the national economy continues to improve, influencing economic growth plays a crucial role in increasing a country's economic development (Reza, Nahar, & Akter, n.d.).

The telecommunication industry plays a vital role in the fast-moving modern world. It delivers the customers to the communication medium for a set of voice, SMS, and data. Telecommunication uses electrical devices such as smartphones, microwave communications, and the internet in the contemporary world. At the same time, the telecommunication industry is highly competitive because multiple telecommunication service providers provide various solutions to the customers; thus, customers move from one service provider to another depending on their needs quickly (Sujah & Rathnayaka, 2019).

Making better customer relationship management is the way to manage the interaction with current and future customers to increase profitability. Most successive organizations continuously research their customers in various aspects such as customer identification, customer attraction, customer retention, and customer development to achieve a high level of customer relationship. Maintaining an efficient relationship with customers can directly affect the industry's profit (Arumawadu, Rathnayaka, & Illangarathne, 2015).

The telecommunication industry is under revenue threats of losing potential customers. Quality of the service or product, the price, and the quality of customer service are the three factors involved in considering the customer's availability in an industry. As a solution, the telecommunication industry needs to increase its capability to understand customer needs and preferences to stay competitive with other sectors, achieve a high level of customer profitability, and continue revenue growth for a long time (Anand, Brunner, Ikegwu, & Sougiannis, 2019).

Customers play a vital role in business success to increase profitability. The customers are categorized into different groups based on their behavioral patterns, such as low, average, and high profitability customers (Sujah & Rathnayaka, 2019). The customer providing the highest profit to the industry will be considered a

High Profitable Customer (Chang & Chong, 2011). Providing different services to different groups of customers based on their profitability level increases customer satisfaction to increase the profitability of the telecommunication industry (Xu, Qiu, & Qiu, 2003).

Data Mining (DM) is extracting hidden information from a large amount of data used to discover new, accurate and valuable patterns (Liang, 2010). DM is a logical process that most researchers use to search through many data to find helpful information for the organization or individual who needs it. Commonly used DM technique has various algorithms and techniques like Classification, Clustering, Regression, Artificial Intelligence, Neural Networks, Associated Rules, Decision Trees, Genetic Algorithm, the Nearest Neighbor method, etc., are used for knowledge discovery from the comprehensive dataset (Han, Pei, & Kamber, 2011).

In this study, we planned to produce an efficient way to predict the profitability of a particular customer or group of customers to the better decision for the future. It isn't easy with the traditional methods and tools (Ćamilović, 2008). For this problem, this study has proposed a new methodology as a solution using DM techniques and machine learning algorithms to get the most precise results. In this research study, the customers are divided into three main categories: (i) Low profitable customers, (ii) Average Profitable Customers, (iii) High profitable customers (Gašpar, Markić, & Ćorić, 2012). Machine learning was adapted to perform the aforementioned classification efficiently.

Some research studies have produced methods to keep customers satisfied by analyzing customer profitability, Fraud Detection, Customer Churn prediction Segmentation of Mobile Customers, etc. This study has focused on a machine learning Approach for grouping the customers in Telecommunication Industry Based on their profitability (Weiss, 2005). Different factors influence the customer profitability level. Based on that, this study used several other behaviors to predict customer profitability.

The following questions were directly interconnected with my research gaps. Those identified research questions can be explained as follows,

RQ1: What factors are necessary for classifying the customers based on profitability?

RQ2: What machine learning algorithms can be used to classify the customers?

RQ3: What preferable algorithm can produce more precise results in making up the classification?

An important objective of many businesses has been to find ways to improve customer satisfaction that directly impact the company's profitability (Chang & Chong, 2011). Customer profitability focuses on the revenue obtained from a customer or group of customers in a specific period. Analyzing and identifying the

profitability received from customers is the most crucial factor for making strategic decisions. The telecommunication industry needs to increase its ability to understand customer needs and preferences to stay competitive with other service providers, achieve a high level of customer profitability, and continue revenue growth for an extended period.

In this research study, the telecommunication customers were first categorized into different customers based on their profitability levels, such as Low Profitability customers, Average Profitability customers, and High Profitability customers, from the data acquired from the industry. The main reason behind doing this research is to identify the Low Profitable customers in advance, and a promotional package will provide to those customers to increase the profitability of the telecommunication industry. So, this research is vital for the telecommunication industry to determine the profitability level of every customer to provide the best services and compete with their other service providers (Foster, Gupta, & Sjoblom, 1996; Väliahdet, 2018).

In this study, to perform our research, we started to search and analyze journals and research papers related to my domain in the IEEE computer society digital library, Springer Link, Science Direct, ACM Digital Library, Academia, and other research sites using the terms like Profitability, telecommunication, Topic Profitability of telecommunication using machine learning techniques. Then we analyzed and selected essential features that affect the telecommunication industry's profitability level. Then we approached a telecommunication industry in Sri Lanka to acquire the dataset. With the collected data set, we further moved to analyze the dataset and further research.

LITERATURE REVIEW AND RELATED WORKS

It is essential to analyze the profitability level of customers in the telecommunication industry in Sri Lanka to increase the profitability of the telecommunication industry.

A study named “Mining profitability of telecommunication customers and customer segmentation with novel DM approach” states that telecommunication industries are under real revenue threats and at risk of losing potential customers. This study aims to cluster the customers based on profitability and develop a model to predict future customers' profitability levels. The first phase involves selecting the optimum K- means algorithm based on processing time and Within Cluster Sum of Square (WCSS). The Artificial Neural Network (ANN) model is developed in the second phase, which focuses on clustering clients based on their behavior. This study combines the two supervised and unsupervised learning techniques to achieve high accuracy (Sujah & Rathnayaka, 2019).

Another study says that customers' potential contribution to a business during a specified period is customer value. Enterprises that understand customer value can give personalized service to diverse clients, resulting in efficient customer relationship management. By using Customer Profitability Analysis (CPA), firms can determine the profit contribution of customer segments or individual customers (Gašpar et al., 2012). By generalizing ways to measure customer lifetime value in direct marketing for larger target marketing applications, this study provides a conceptual and methodological foundation for quantifying customer profitability (Xevelonakis, 2005). The accurate specification of the inputs into a profitability analysis is given special attention. An empirical study of customer profitability is described in a business-to-business marketing context (Väliähdet, 2018).

Customers are the most critical asset of an organization. Without customer satisfaction, there cannot be a long-run business. Customer Relationship Management (CRM) is a strategy for building, managing, and strengthening loyal and long-lasting customer relationships (Sujah & Rathnayaka, 2019; Tsiptsis & Chorianopoulos, 2011). According to the swift, companies can benefit from CRM implementation. The areas of the benefits found:

- Lower cost of recruiting customers.
- Reduced cost of sales.
- High customer profitability.
- Increased customer retention and loyalty.
- Evaluation of customer profitability.

Another study states that competitive marketing strategies are frequently altered dynamically and fast in a near-perfect market. Customer profitability is unpredictably affected by changes in customer behavior. In the telecommunication industry, keeping their customers satisfied helps to succeed in their competitive environment (Armstrong, 1997; Laffont & Tirole, 2001). Creating relevant customer groups based on individual account attributes and behaviors is called segmentation. This study proposes a resolution of customer segmentation for the telecommunication industry using K-means clustering. The main goals were to categorize clients based on their behavior and give services to the appropriate group (Reza et al., n.d.).

Good marketing practice to build profitable relationships with customers. An industry should know how current customer relationships differ in profitability and which customer segment provides the highest potential for future profitable customer relationships (Mulhern, 1999). The researcher mentioned that the industry wants to attain four goals with the implementation of CPA:

- An improved understanding of the firm's sources of profitability.

- An enhanced understanding of the relationship between (characteristics of) customers and costs.
- An enhanced understanding of the relationship between the behaviors of employees and costs.
- Better informed decisions about the allocation of resources to customers and market sectors.

Customer profitability (Van Raaij, 2005) is the telecommunication industry's profit from serving a customer or customers in a specific period. Making the best customer relationship management is how to manage the interactions with current and future customers (Smith & Dikolli, 1995). Most successive organizations are continuously doing research for their customers on customer identification, customer attraction, customer retention, and customer development to achieve a high level of customer relationships.

Jansen (2007) used different clustering techniques to segment the customers and a Support Vector Machine (SVM) to profile the segmented customer (2007). Tsipsis and Chorianopoulos (2011) discussed customer segmentation in telecommunication using the basis of user behavior using two approaches: analysis and value-based segmentation. Identify the segments using a data reduction technique (PCA) to reveal the distinct dimension of information using the clustering technique, using the K-Means clustering the simulation result data used to support customer segmentation analysis.

The concept of Customer Profitability Management (CPM) has been developed. The framework of CPM will be established, monitoring customer profitability is emphasized, and the criteria with their levels of operations are proposed to facilitate the implementation. The conceptual framework of Customer Asset Management (CAM) will be extended to a practical CPM system. It measures amount identification, trend identification, volatility identification, and accessibility identification (Sujah & Rathnayaka, 2019).

Another study state that the DM methodology has made a significant contribution to researchers' ability to extract hidden knowledge and information from the data they utilize. DM is a powerful technique that helps companies discover customer behaviors and preferences (Hajiha, Radfar, & Malayeri, 2011). It is also used for the CRM system. DM techniques provide numerous ways to extract hidden knowledge and information. This study proposes a new procedure using the RFM model to identify the optimal number of initial clusters based on the K-Means algorithm. Based on the results, telecommunication customers in Sri Lanka are mainly categorized into three levels (Wei & Chiu, 2002).

Targeting profitable customers is an essential objective for revenue increment in an industry. Saving financial and human resources is efficient and provides

the organization with the right customer to be addressed for the right product or services (Savvas, Chaikalis, Messina, & Tselios, 2017). The ultimate marketing and ROI (Return on Investment) opportunity facilitates customer loyalty through the respective purchase of the products or services. It creates new opportunities and new customers (Smith & Dikolli, 1995).

DM, or discovering knowledge in databases, has grown important as a study topic with numerous applications. Knowledge mining techniques will be investigated in relational, transactional, object-oriented, geographic, and active databases and global information systems (Sabbah, 2018). Potential DM applications will be presented as some research issues (Wei & Chiu, 2002).

Clustering is the partitioning of data into a group of similar items. Clustering is useful in various DM applications, including scientific data exploration, information retrieval, text mining, spatial database applications, Web analysis, CRM, marketing, medical diagnostics, computational biology, etc. DM adds to the complexity of clustering massive datasets with many attributes (Hosseini, Maleki, & Gholamian, 2010).

A study named “Research on k-means clustering algorithm: An improved k-means clustering algorithm” states that in each iteration of the k-means clustering algorithm (Arumawadu et al., 2015), the distance between each data object and all cluster centers must be calculated, reducing clustering efficiency. This study presents a better solution, which necessitates the usage of a fundamental data structure to store some information in each iteration, which will be used in the subsequent iteration. The new approach effectively improves clustering speed and accuracy according to experimental data.

Telecommunication companies are too large to extract useful information from customers’ data. The use of clustering techniques is one of the ways to analyze this data. The density-based spatial clustering algorithms DBSCAN and k-means organize data based on the minimum size of participating items per cluster. Because the two methods utilize different paths to group the data, they form other clusters. However, each one has its significance based on the applied method’s characteristics (Hajiha et al., 2011).

There are many studies on our related area, but we found their inefficiencies to overcome in our research. The keyword-based searches made the first part of our literature review for telecommunication threats of losing potential customers in Sri Lanka. We found a lack of technology usage in this area. So, we planned to come up with a comprehensive technology-based solution. Then the profitability analysis, there were plenty of studies to group customers based on their profitability levels, such as highly profitable customers, low profitable customers, and average profitable customers. So, this is quite a challenge for us. DM is part of our research. We used the simple classification algorithm to solve the problem efficiently.

METHODOLOGY

As discussed in the previous segments, the literature study has been done to identify several research gaps. According to those studies, the model was developed by considering several traditional and prevailing machine learning techniques. The final model was developed to identify the class of the customers based on their profitability. This chapter describes the overall explanation of various approaches that have been used to find out the profitability level of customers.

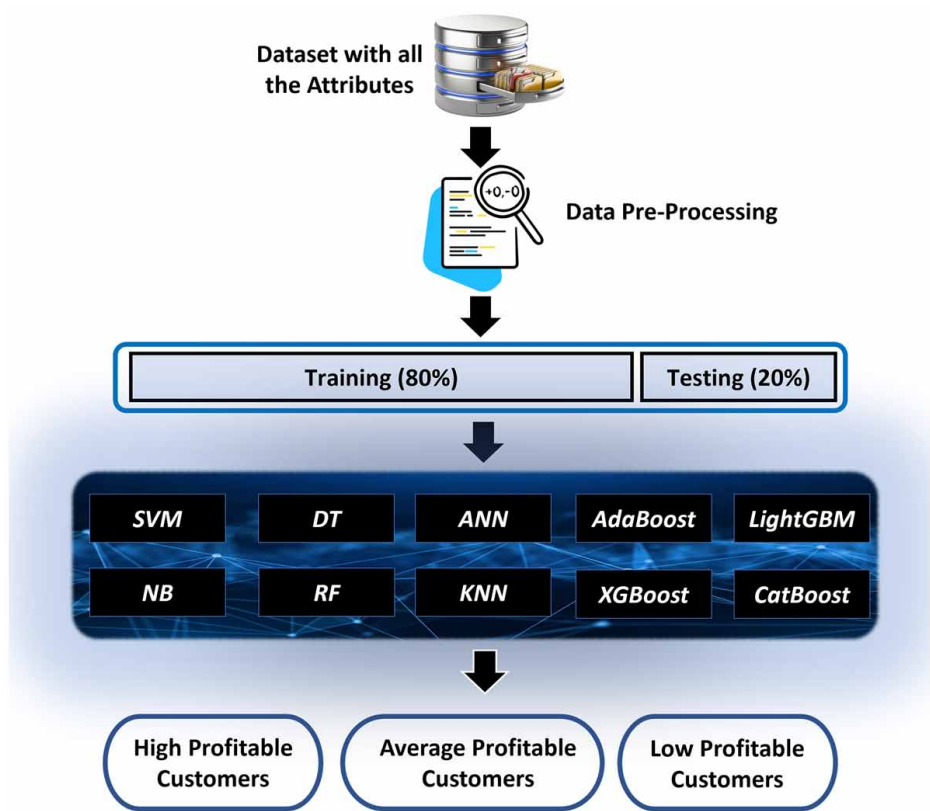
High-Level Architecture of the Model

The initial step focuses on storing and grouping data. The acquired data will be saved in a CSV file containing information about some customers' past behavior, including high profitability customers, Low profitability customers, and Average profitability customers. The data set will next be pre-processed to eliminate anomalies and outliers. For instance, the missing values have been replaced with the mean value of the corresponding column. The list of High profitability customers, Low profitability customers, and Average profitability customers (Target variable) is essential to developing the final prediction model.

The variables identified through feature engineering approaches and the target variable (High profitability customers, Low profitability customers, and Average profitability customers) acquired from the dataset are put into a new CSV file in the second phase. The entire data set is divided into “training” and “testing.” The training and testing data sets are then fed into several supervised learning approaches and analyzed against specific evaluation metrics to identify the algorithm with more precise results.

Figure 1 represents the high-level architecture of the model.

Figure 1. Research methodology



Furthermore, the following steps have been clearly explained the entire process utilized during the implementation of the model in detail.

1. Dataset and Requirement analysis
2. Data Pre-processing
3. Feature Engineering
4. Comparing the performance of several algorithms in the prediction of results.
5. Model construction

Dataset and Requirement Analysis

The first step in analyzing customers' requirements for a novel or customized product is to conduct a requirement analysis. Before designing any software project or model, it is critical to identify the project's primary needs/requirements. Capturing requirements can be done in a variety of ways. Many aspects can be used

to accomplish the goal of finding facts. Interviews, brainstorming, questionnaires, web scraping, data consumption from a Web API, and so on are a few examples.

This research could be conducted with the help of a local telecommunications service provider. Over 10,000 pre-paid subscriber details are being collected and analyzed as part of this study. The dataset contains information about the customers' previous behavior. Here we have three classes in our target, namely Highly profitable customers, Average profitable customers, and low profitable customers, represented with the value of 3, 2 and 1, respectively. Table 1 describes the 12 attributes considered essential and the detailed descriptions of each attribute.

Table 1. Selected attributes and their description

No	Attribute	Description
1	Monthly Bill	The average amount of payment done by the Customers
2	Billing complaint count	Number of complaints concerning bills
3	Promotions	The Short Message Services (SMS)s provided by the company to the customers about their products, services, and so on
4	Hotline call time	Total number of minutes taken for hotline call duration in a specified period
5	Hotline call count	Total number of hotline calls in a specified period
6	Negative feedbacks customer sent	The count of negative feedback given by a customer
7	Total complaints	Number of complaints made by a customer
8	Coverage related	Complaints made regarding coverage complaint count
9	Adjustment charges	Alternative charges for additional packages
10	Download bandwidth	Average download bandwidth
11	Data used for download	The total amount of data used
12	Data Charges	Total payment for data usage

Data Pre-Processing

Data Pre-processing is the process of filtering data from a data set that is inaccurate, noisy, or inconsistent. It is a critical phase of the process of developing any prediction model. There is no universal pre-processing phase for all data types because data sets vary from one another. Data from visuals, for example, differs from data generated by sounds. Normalization is one of the pre-processing procedures that can be applied in several situations. Normalization has been planned to lower the variability between the available data and put the qualities within a specific range.

A Machine Learning Approach

The data pre-processing has been conducted using the “python pandas library.” The following activities have been carried out using the library as mentioned above.

1. Storing raw data into CSV file.
2. Loading CSV file with pandas.
3. Check for the number of columns and rows.
4. Removing the unnecessary columns.

The data set included a column called “Customer ID,” representing the ID of a customer that helps identify each customer uniquely. The column has been excluded from the dataset because it is not relevant for the prediction purpose.

5. Check for null and duplicate values.
6. Converting all the variables to a common type.
7. Outlier detection and replacements.

For every column, outlier values have been identified. (First Quartile (Q1), Third Quartile (Q3), and the Inter Quartile Range (IQR) values of each column have been used.)

Random values are replaced with values within the quartile range for outlier-detected cells.

Every column value is validated to be within the quartile range limit.

Generate a new CSV file that excludes the outlier data.

8. Normalizing the data set within fixed ranges,

The Min-Max Scaling technique has been adopted.

9. Scaling the data in a standardized way.

In this case, the Python “StandardScaler” library has been adopted.

Comparing the Performance of Several Algorithms in the Prediction of Results

After identifying the distribution of High Profitability customers, Average Profitability customers, and Low profitability customers from the acquired data, the entire data set is divided into two non-equivalent partitions: training and testing with 70% and 30%, respectively. The data is then fed into supervised learning approaches (Random Forest, XGBoost, AdaBoost, Logistic Regression, Neural Network, and

Decision Tree) to determine the best for developing the final prediction model. The programming language Python has been used to handle machine learning algorithms. Furthermore, Scikit-learn was utilized to adapt the supervised machine learning approaches discussed earlier.

Accuracy, Precision, Recall, F1-Score, Confusion Matrix, Mean Squared Error (MSE), Mean Absolute Error (MAE), and other measures are used to assess the prediction performance of the methodologies under consideration. Cross-Validation procedures are also used with both training and testing data.

The partitioning of a data set into many parts is known as cross-validation. Furthermore, this procedure will repeat itself until one of the partitions (in any combination) is chosen for training and testing. As a result, developing a more accurate strategy to deal with any proportion of testing and exercise data will be easier. The abovementioned task was completed using the K-fold cross-validation technique.

Model Construction

This procedure will end with building the final prediction model after identifying the best algorithm with the highest accuracy.

Research Environment and Overview of the Algorithms Used

Python programming language is used in this research. This language is mainly used for data pre-processing, data analysis, feature engineering, clustering, plotting tasks, etc. Python facilitates the usage of modules and packages, allowing programs to be created flexibly. The codes can be applied to a wide range of products. Pandas, NumPy, and sklearn were the libraries we used for our research.

NumPy adds support for broad, multi-dimensional arrays and matrices to its extensive range of high-level mathematical functions for working with these arrays.

Pandas is a licensed 3rd party python library that provides high-performance data analysis tools and easy-to-use Python programming language data structures. It is an open-source setup for a python programming language.

Scikit learns library adapts the supervised and unsupervised machine learning techniques.

PyCharm Community Edition is a free, open-source program with built-in Python development tools. PyCharm includes intelligent code completion, inspections, on-the-fly mistake highlighting and fast repairs, automated code refactoring, and comprehensive navigation tools.

Machine learning algorithms are often employed to classify customers based on profitability. The methodologies utilized in the volume of pieces of literature can be divided into the following categories.

A Machine Learning Approach

1. Ensemble technique (Random Forest, AdaBoost, XGBoost, CatBoost, LightGBM)
2. SVM
3. ANN
4. Decision Tree Algorithm
5. K-Nearest Neighbors Algorithm (KNN)
6. Naive Bays Classification Algorithm

Ensemble Technique (Random Forest, AdaBoost, XGBoost, CatBoost, LightGBM):

Ensemble-based learning brings out the ways of prediction by combining the outputs of multiple classifiers. Bagging and boosting procedures are commonly used in ensemble learners.

Random Forest builds several classification trees during the training process, expanding on the basic idea of a single classification tree. Each decision tree in the random forest gives an outcome (Preferring for a class) to group an instance, and the model chooses the class with the most preferences. One of the critical advantages of Random Forest over regular decision trees is that it protects overfitting, which improves model accuracy.

The observations gathered by the AdaBoost filters reduce the number of correct predictions. This procedure is developed by assigning more weight to difficult ones (Problematic ones) or those that the feeble learners could not handle. Both strong and feeble learners are grouped based on their alpha weights. A higher alpha weight can be reached when the contributions to the eventual learner are more significant. AdaBoost is a boosting ensemble model that works well with decision trees. The key to improving a model is learning from earlier mistakes, such as misclassifying data points.

Decision trees with one level, or Decision trees with only one split, are the most popular algorithm used with AdaBoost. Decision Stumps is another name for these trees. This approach creates a model by assigning equal weights to all data points. It then gives points that are incorrectly categorized as a higher weight. In the next model, all issues with more significant consequences are given more importance. It will continue to train models till a low error is received. The inaccurately classified record in the first model is provided priority as the first decision tree/model is created. Only these records are sent to the second model as input. The procedure continues until we have decided on several base learners to develop. Remember that all boosting strategies allow for record repetition.

XGBoost (Extreme Gradient Boosting) is a parallel tree strategy for effectively dealing with a group of weak trees. Decision trees with boosted gradients are used

in XGBoost, which improves speed and performance. It is strongly reliant on the target model's computational speed and performance. Gradient boosted machines are slow to implement because model training must be done in a specific order.

CatBoost is a decision tree gradient boosting technique. It was created by Yandex researchers and engineers and used by Yandex and other organizations for search, recommendation systems, personal assistants, self-driving cars, weather prediction, and many other tasks. Anyone can use it because it is open-source. CatBoost produces cutting-edge results that compete with any leading machine learning algorithm in performance. We can use CatBoost without any explicit pre-processing to convert categories to numbers. CatBoost translates categorical data to numerical values using a variety of statistics based on categorical features and categorical and numerical features. It eliminates the need for intensive hyper-parameter adjustment and decreases the risk of overfitting, resulting in more generic models. CatBoost, on the other hand, includes several parameters to tweak, including the number of trees, learning rate, regularisation, tree depth, fold size, bagging temperature, and others. CatBoost may be used directly from the command line, thanks to a user-friendly Python and R API.

Light GBM is a gradient boosting framework based on the decision tree technique that may be used for ranking, classification, and various other machine learning applications. It splits the tree leaf-wise with the best fit because it is based on decision tree algorithms, whereas other boosting methods split the tree depth-wise or level-wise rather than leaf-wise. As a result, when growing on the same leaf in Light GBM, the leaf-wise approach reduces more loss than the level-wise algorithm, resulting in substantially higher accuracy than any existing boosting strategies. It's also surprisingly fast, called 'Light.' The Light GBM approach is built on a histogram, which buckets continuous feature values into discrete bins to speed up the training process. Replaces continuous data with discrete compartments, resulting in less memory use. It uses a leaf-wise split strategy rather than a level-wise split approach to build significantly more complicated trees, the primary element in achieving higher accuracy. It can, however, lead to overfitting, which can be avoided by increasing the max depth parameter.

SVM

The SVM performs data analysis activities to find trends. SVM stands for monitoring of multi-dimensional space points when given a set of labeled training data. It also tries to identify the best hyper planes between different instances. Unique examples are placed in the comparable area and categorized into a particular class based on their proximity to the dividing gap.

ANN

It's a deep learning mechanism in a manner. The biological network found in the human brain is used to develop this network. This method works well when dealing with enormous volumes of data with multiple features. It's a simple method to pick up and can be learned by doing. ANN is made up of layers of neurons organized in a grid. One or more hidden layers would communicate with the layer detected in the input. After that, communication with the output layer occurs. Weighted linkages always connect layers.

Decision Tree Algorithm

Decision Tree Analysis is a general-purpose predictive modeling tool with applications in various fields. Decision trees are built using an algorithm that determines multiple ways to segment a data set based on certain conditions. It is one of the most popular and practical supervised learning algorithms. Decision Trees are a supervised non-parametric learning method that may be utilized for classification and regression applications. The goal is to learn simple decision rules from data attributes to develop a model that predicts the value of a target variable.

In actuality, a decision tree is made up of the following nodes:

1. Internal nodes: Every node is a feature-level test point and points to a single attribute.
2. Branches: These features describe the real outcome of the test and are made up of the lines that eventually lead to the leaf nodes.
3. Leaf nodes: These are the labels for the classes. The decision criteria are then created and categorized as fresh instances/opportunities.

The Decision Tree is a flexible method for analyzing categorical and continuous data. They've grown in popularity due to their adaptability, and they're now one of the most widely utilized churn prediction models.

K-Nearest Neighbors (KNN) Algorithm

The supervised machine learning algorithm k-nearest neighbors (KNN) is a simple, easy-to-implement technique that may be used to address both classification and regression issues. KNN can be used for classification, with the output being a class membership (a discrete value that predicts a class). A majority of an object's neighbors vote to classify it, with the object being allocated to the most common class among its k closest neighbors. It can also be used for regression, with the

output being the entity's value (predicts continuous values). This value represents the average (or median) of its k closest neighbors' values.

Naive Bayes

It's a classification method based on Bayes' Theorem and the assumption of predictor independence. A Naive Bayes classifier, in simple terms, posits that the existence of one feature in a class is unrelated to the presence of any other feature. The Naive Bayes model is simple to construct and is especially good for large data sets. Naive Bayes outperforms even the most advanced classification systems due to its simplicity. A family of algorithms shares a similar idea: each classified pair of features is independent of the others.

This study aims to rely as little as possible on domain knowledge and instead rely on statistical analysis and machine learning.

RESULTS AND FINDINGS

The Ultimate goal of this research is to build a model for classifying the customers based on their profitability level with the adaption of supervised machine learning techniques.

This stage could open the way to model this method towards a "Supervised Learning Technique" in machine learning, as the target variable and highly associated variables were determined throughout the research approach mentioned above. In order to forecast the results, several algorithms have been adapted and compared against specified evaluation indicators. The findings of the comparisons collected during this approach will be explained further.

Ten thousand subscriber details with 12 attributes and one target variable were examined. The training and testing datasets are chosen randomly, with 70% for training and 30% for testing. The computer language Python has been used to handle machine learning algorithms. For this study, Scikit-learn was employed as the machine learning library. Scikit-learn is a Python library that is open source. The following tables 2, 3, and 4 show the evaluation metrics results obtained for the algorithms.

Table 2. Models with evaluation metrics results

Models	Accuracy (%)	MSE (%)
AdaBoost	76.46	57.33
ANN	79.00	21.00
CatBoost	79.26	52.93
Decision Tree	68.10	80.90
K-Nearest Neighbor	71.86	67.63
LightGBM	79.90	51.70
Naive Bayes	69.77	82.03
Random Forest	79.53	52.16
SVM	80.00	30.60
XGBoost	78.40	57.40

Table 3. Performance of Individual classifiers against basic evaluation metrics.

Classifier	Classes	Evaluation Metrics			Accuracy (%)
		Precision (%)	Recall (%)	F1 – Score (%)	
AdaBoost	Low Profitable customers	87.00	61.00	72.00	76.00
	Average Profitable customers	73.00	62.00	67.00	
	High Profitable customers	74.00	92.00	82.00	
ANN	Low Profitable customers	89.00	63.00	74.00	79.00
	Average Profitable customers	83.00	62.00	71.00	
	High Profitable customers	75.00	96.00	84.00	
CatBoost	Low Profitable customers	89.00	63.00	74.00	79.00
	Average Profitable customers	80.00	67.00	73.00	
	High Profitable customers	76.00	95.00	84.00	

Continued on following page

Table 3. Continued

Classifier	Classes	Evaluation Metrics			Accuracy (%)
		Precision (%)	Recall (%)	F1 – Score (%)	
Decision Tree	Low Profitable customers	65.00	63.00	64.00	68.00
	Average Profitable customers	60.00	67.00	63.00	
	High Profitable customers	74.00	72.00	73.00	
K-Nearest Neighbor	Low Profitable customers	74.00	66.00	70.00	72.00
	Average Profitable customers	64.00	59.00	61.00	
	High Profitable customers	73.00	81.00	77.00	
LightGBM	Low Profitable customers	90.00	63.00	74.00	80.00
	Average Profitable customers	81.00	68.00	74.00	
	High Profitable customers	76.00	95.00	85.00	
Naive Bayes	Low Profitable customers	86.00	86.00	86.00	70.00
	Average Profitable customers	95.00	95.00	95.00	
	High Profitable customers	92.00	90.00	91.00	
Random Forest	Low Profitable customers	90.00	62.00	74.00	80.00
	Average Profitable customers	81.00	67.00	73.00	
	High Profitable customers	76.00	95.00	84.00	
SVM	Low Profitable customers	91.00	63.00	75.00	80.00
	Average Profitable customers	87.00	63.00	73.00	
	High Profitable customers	75.00	97.00	84.00	

Continued on following page

Table 3. Continued

Classifier	Classes	Evaluation Metrics			Accuracy (%)
		Precision (%)	Recall (%)	F1 – Score (%)	
XGBoost	Low Profitable customers	85.00	62.00	72.00	78.00
	Average Profitable customers	82.00	64.00	72.00	
	High Profitable customers	75.00	93.00	84.00	

Table 4. Models with confusion metrics results.

Models	Confusion Matrix
AdaBoost	$\begin{bmatrix} 552 & 49 & 308 \\ 50 & 373 & 180 \\ 30 & 89 & 1369 \end{bmatrix}$
ANN	$\begin{bmatrix} 575 & 35 & 306 \\ 58 & 369 & 149 \\ 129 & 174 & 1067 \end{bmatrix}$
CatBoost	$\begin{bmatrix} 570 & 35 & 304 \\ 52 & 401 & 150 \\ 18 & 63 & 1407 \end{bmatrix}$
Decision Tree	$\begin{bmatrix} 571 & 95 & 243 \\ 67 & 405 & 131 \\ 247 & 174 & 1067 \end{bmatrix}$

Continued on following page

Table 4. Continued

Models	Confusion Matrix
K-Nearest Neighbor	$\begin{bmatrix} 601 & 42 & 266 \\ 78 & 355 & 170 \\ 129 & 159 & 1200 \end{bmatrix}$
LightGBM	$\begin{bmatrix} 560 & 95 & 241 \\ 28 & 401 & 142 \\ 16 & 53 & 1307 \end{bmatrix}$
Naive Bayes	$\begin{bmatrix} 568 & 35 & 306 \\ 50 & 401 & 152 \\ 11 & 60 & 1417 \end{bmatrix}$
Random Forest	$\begin{bmatrix} 568 & 35 & 306 \\ 50 & 401 & 152 \\ 11 & 60 & 1417 \end{bmatrix}$
SVM	$\begin{bmatrix} 575 & 20 & 314 \\ 50 & 381 & 172 \\ 6 & 38 & 1444 \end{bmatrix}$
XGBoost	$\begin{bmatrix} 559 & 28 & 314 \\ 58 & 369 & 149 \\ 44 & 55 & 1424 \end{bmatrix}$

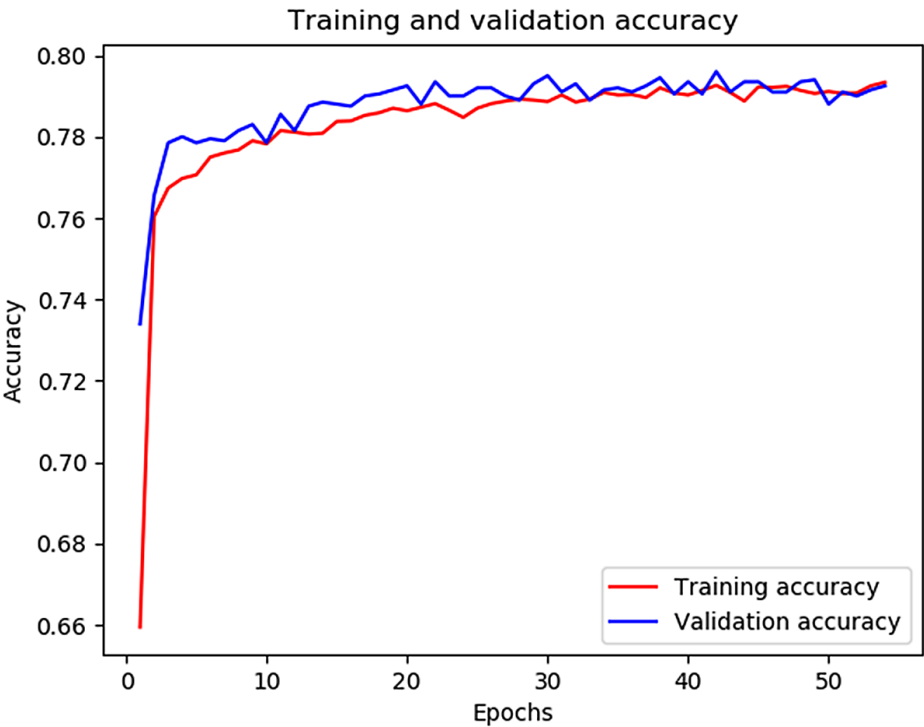
In addition to the results from the tables mentioned above, the K-fold cross-validation technique has been performed with five folds to find the best technique to deal with any proportion of testing and training data. The results obtained from the K-fold cross-validation are shown in Table 5 below.

Table 5. Fivefold cross-validation accuracies of selected algorithms

Algorithm	1 st Fold Accuracy	2 nd Fold Accuracy	3 rd Fold Accuracy	4 th Fold Accuracy	5 th Fold Accuracy	Mean Accuracy
AdaBoost	64.15	85.85	84.05	76.6	67.3	71.06
ANN	76.47	70.59	66.67	67.74	48.39	65.97
CatBoost	63.75	88.75	86.0	80.0	71.5	72.64
Decision Tree	55.35	68.6	68.95	66.0	65.0	63.4
K-Nearest Neighbor	56.9	80.05	71.65	70.6	64.0	67.59
LightGBM	65.7	88.6	87.85	81.75	72.4	73.56
Naive Bayes	36.35	85.65	80.55	73.55	62.8	67.78
Random Forest	66.35	87.1	87.9	81.35	71.85	73.75
SVM	67.4	90.3	87.7	80.1	71.1	77.86
XGBoost	64.45	85.45	86.6	81.2	72.05	73.01

Figure 2 shows the training and testing results obtained from ANN Algorithm

Figure 2. Training and testing made during the ANN algorithm



Ultimately, with all the analyses, SVM has outperformed all other techniques with higher accuracy of 77.86% and a low error rate of 22.14%. So, the conclusion can be made that the SVM is the suitable algorithm for developing the final prediction model.

DISCUSSIONS, CONCLUSION, AND FUTURE WORKS

For almost all businesses, including start-ups, identifying the class of the customer based on the profitability behavior is critical. This study successfully tested grouping customers based on their profitability level in the communications business as an experimental method. It is commonly acknowledged that this industry is becoming increasingly competitive, and as a result of having more options in this field, customers are leaving. Customers are grouped in advance using the abovementioned method.

This study used ten thousand pre-paid subscribers' details from a Sri Lankan telecommunications operator. The entire data set was first classified using a classification method to extract the specifics of the high lucrative customers, low profitable customers, and average profitable customers from the available data. Finally, High profitable customers, Low profitable customers, and Average profitable customers were developed to represent the group of customers. Five thousand are High lucrative consumers, 2000 are Average profitable customers, and the remaining 3000 are Low profitable customers, according to the data collected from the groups.

Furthermore, this research attempted to adapt various supervised machine learning approaches, and through this method evaluation, many performance indicators were evaluated. In addition, a comprehensive comparison of algorithms such as Decision Tree, LightGBM, Random Forest, SVM, XGBoost, AdaBoost, Naive Bayes, CatBoost, ANN, and K-Nearest Neighbor was conducted. Following that, proper cross-validation of the above algorithms was performed to produce the final prediction model with a more accurate technique. As previously stated, SVM Algorithm gave a higher accuracy result of 77.86% while having a low error rate of 22.14%.

In the future, rather than using the simple classifier, researchers have planned to adapt the Hybrid Approaches and Deep Learning Approaches to developing the final prediction model.

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KEY TERMS AND DEFINITIONS

Cross-Validation: Cross-validation is a resampling method for evaluating machine learning models on a small sample of data.

Machine Learning: Machine learning (ML) is a sort of artificial intelligence (AI) that allows the software to improve its accuracy at predicting outcomes without being explicitly programmed to do so.

Multi-Class Classification Problem: A classification problem with more than two classes, such as identifying a pug, bulldog, or trabeation mastiff from a series of dog breed images. Multi-class classification assumes that each sample is assigned to one of several classes; for example, a dog can be a pug or a bulldog, but not both at the same time.

Prediction: When anticipating the likelihood of a given result, such as whether or not a customer would churn in 30 days, “prediction” refers to the output of an algorithm after it has been trained on a previous dataset and applied to new data.

Supervised Machine Learning: Supervised learning, often known as supervised machine learning, is artificial intelligence and machine learning subcategory. It uses labelled datasets to train algorithms that accurately classify data or predict outcomes defined it. As input data is fed into the model, the weights are adjusted until the model is correctly fitted during the cross-validation phase.

Chapter 2

Website Usability, Website Interactivity, and Website Personality as Drivers of Online Purchase

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ABSTRACT

Having a website is no longer an option for businesses but a necessity in the new digital economy. To meet this challenge, companies must design websites facilitating electronic transactions and retaining customers. Hence, companies need to know and focus on the key triggers that drive consumers to buy online. This chapter sheds light on the effects of three fundamental website features on online shopping. Website usability, website interactivity, and website personality describe the evolution of website design. Website design has changed to become more responsive and efficient. To develop their first websites, companies focused on usability and ease of use. Website usability aims to strengthen the user's perceived control and facilitate online shopping. The expectations of online shoppers have evolved by requiring a highly captivating and engaging online experience. Therefore, companies tried to meet those expectations by developing interactive and playful websites. To stand out from the competition, companies rely on symbolism and website personality.

DOI: 10.4018/978-1-7998-9553-4.ch002

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INTRODUCTION

E-commerce is growing constantly and quickly. In 2017, e-commerce was responsible for around \$2.3 trillion in sales and is expected to hit \$4.5 trillion in 2021 (Statista report). In the US alone, e-commerce represents almost 10% of retail sales and that number is expected to grow by nearly 15% each year. In Africa and the Middle East, Revenue in the e-commerce market amounts to US\$20,744 m in 2019. Revenue is expected to show an annual growth rate of 7.2%, resulting in a market volume of US\$27,417 m by 2023 (Statista report).

This growth is fueled by the advantages of online shopping (wide choice of products, online store accessible 24 hours a day around the world). The emergence of the internet has created opportunities for companies to stay competitive by providing customers with a convenient, faster, and cheaper way to make purchases (Lee et al, 2011).

Unfortunately, many companies fail to make profits via the internet. The main challenge for their websites is to convert visitors into buyers. Customers' purchase intention is considered a predictor of their actual behavior. Hence, businesses need to understand their customers' purchase intentions (Hasanov and Khalid, 2015). The website experience pushes consumers to spend more time and revisit. Website features can increase the likelihood of a purchase. With a good understanding of their consumers, e-tailers may be able to develop more effective websites that meet the requirements and expectations of their consumers.

The key factors of success in the virtual environment do not consist in being present on the internet or proposing low prices but in delivering a high-quality experience (Schmitz & Latzer, 2002). Yet, success resides in building an attractive online experience. Online shoppers are more volatile than traditional consumers because another website is one click away. The overall online experience becomes a lever for action to satisfy and retain consumers. The consumer is not only looking for a product but is looking for a different experience (Schmitz et al, 2011).

The "build it and they will come" attitude has led to the failure of several commercial websites which are too slow or too complex for ease of use (Lee and Kozar, 2012). Given the fickle nature of customer behavior, the growth in global web stores, and the increasing product and service availability (Qureshi et al, 2009), it is essential to go beyond the factors traditionally presented as predictors of online buying. Among various design characteristics, interactivity and usability stand out as key factors that impact users' responses to a website (Foster et al., 2014).

The increasing level of competition motivated many firms to look for new sources of differentiation. Safe values such as content quality and customized offers are becoming less effective in attracting and retaining customers. Many firms stated new positioning based on consumer experience and symbolism (Shobeiri et al,

2013). Consumers aspire to convey their symbolic status through consumption. The purchase act can carry and reflect higher symbolic content (i.e., brand personality) (Das, 2014). Differentiation was built step by step through usability and website design to differentiation through website personality. Chang et al. (2005) categorized the antecedents of online buying into three categories: perceived characteristics of the web as a sales channel, product attributes, and consumer characteristics. Thus identifying more than 80 variables (value, ease of use, usefulness, privacy, trust, reliability, usability) as antecedents. This chapter focuses on website characteristics as the drivers of online purchasing. More precisely, we analyze the role of the utilitarian aspect, the hedonic aspect, and the symbolic aspect in the online purchase process. These aspects describe the evolution of website design, which has improved over time to retain consumers and convert visitors into buyers. Therefore, we chose three attributes that best reflect these three aspects which are respectively: website usability, website interactivity, and website personality.

So we will try to answer two research questions:

RQ1: How have website characteristics evolved?

RQ2: How do expectations of website usability, website interactivity, and website personality influence online purchase?

Figure 1. Online purchase drivers



THE ONLINE BEHAVIOR

Purchase intention indicates the likelihood that consumers will plan or be willing to purchase a product or service in the future. The increase in purchase intention reflects an increase in the chance of purchasing (Martins et al, 2018). Ajzen (1991) suggested that intention is the extent to which people are willing to perform a behavior. It also describes the number of times the individual tries to perform the behavior. According to Koo and Ju (2010), the intention depicts the user's predisposition

toward website use in the future. The intention to buy fits into a larger whole which is the approach behavior. Approach behavior covers the intention to explore the website, stay, and return.

A website should understand the customers' purchasing patterns to build and maintain a good relationship with customers (Lim et al, 2016). Consumers will only use a website if they believe that using that website will increase their performance. In other words, it allows them to achieve their goals. Online purchasing provides consumers with advantages such as time savings, increased convenience, and reduced costs. Online shopping facilitates the decision-making process by allowing price comparisons (Park and Kim, 2003). Moreover, online shoppers are particularly looking for time-saving, personalized, and varied offers and shopping convenience (Liao and Lin, 2007; Sebald and Jacob, 2019)

Since online purchase involves information sharing (credit card number, address, phone number) and purchases action, purchase intention will depend on many factors. Online stores need to focus on the website attributes that reassure consumers and enhance the retailer's reliability to trigger online purchase intention (Thamizhvanan and Xavier, 2013).

Example: E-commerce is growing rapidly in Tunisia. Online shopping offers consumers the opportunity to open up to new markets, buy from anywhere in the country, save time and enjoy the promotions offered by e-retailers. The most popular products are clothes and shoes. The most used method of payment is the payment on delivery. Tunisian consumers are still cautious about paying online.

Website Triggers of the Online Buying Experience

Website Usability

The website interface is the main source upon which users can judge its trustworthiness in the absence of other 'real world' tangible cues (Qureshi et al, 2009). A well-designed interface can reduce consumer anxiety by increasing the customer's belief that the e-retailer will behave in a competent, benevolent, and trustworthy manner (Flavian et al, 2006).

Furthermore, user-friendly navigation functions provide users with a high sense of monitoring or control over their online experience and reduce uncertainty and perceived risks. These characteristics enhance initial trust in the online retailer (Qureshi et al, 2009).

Usability is defined "as the effort required using a computer system" (Nielsen, 2000). Lee and Kozar (2012) define usability as the extent to which a product can

be used to achieve specific goals with effectiveness, efficiency, and satisfaction in a specified context of use. Website usability is defined as the perceived ease in accessing desired information from a website (Karat, 1997).

Website usability reflects the perceived ease of navigating or making purchases through the internet and it is considered a critical factor in the development of electronic commerce (Flavián et al., 2006). Website usability reflects perceived utility, perceived ease of use, and convenience. Sunil et al. (2006) define perceived usability as «the degree in which the website allows the consumer to realize the tasks he intends to do.

Usability refers to the effort required to operate a system or technology. Usability relates to different aspects such as the ease with which the user learns to handle a system, the ease of storing the basic functions, and the degree of error avoidance. Therefore a high level of usability is associated with a low level of difficulty (Casalo et al, 2008).

Usability is “how well and how easily a user, without formal training, can interact with an information system of a website”. A usable system must be compatible not only with users’ cognitive skills in communication, understanding, memory, and problem solving (Chiew and Salim, 2003). A website with high usability is a website that possesses fast and accurate search capability, rich content, and interactive mechanisms. Website usability reflects the perceived ease of navigating or making purchases through the internet and it is considered a critical factor in the development of electronic commerce (Flavián et al., 2006).

Example: Several companies apply “the adaptive design” which adapts the display according to the connected device, which is a computer, a smartphone, or a tablet.

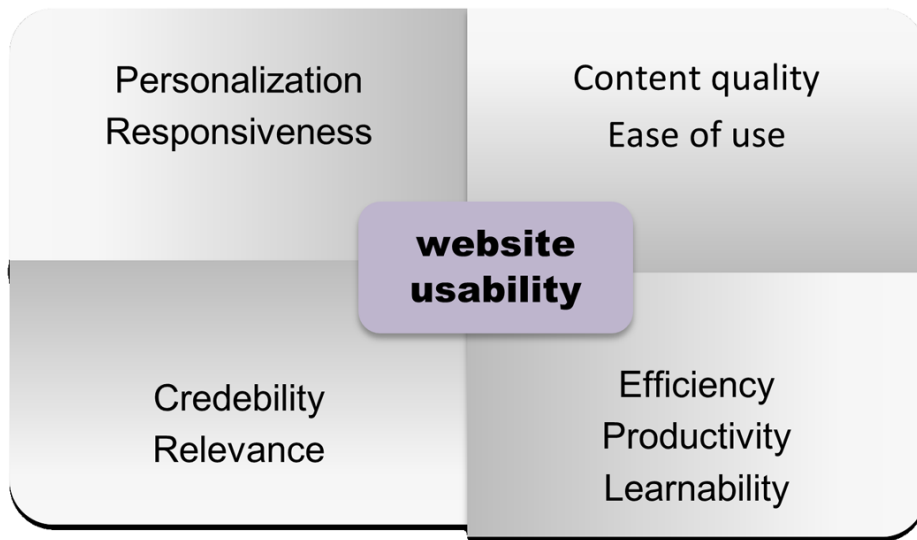
Website Usability Components

Research has suggested that well-developed content, simplicity, navigability, and readability are the main facets of website usability. Usability experts’ proposed several website usability factors: ease of use, readability, content quality, fun, productivity, completeness, relevance, navigation, response time, credibility, and content (Pee et al, 2018).

Microsoft Usability Guidelines (MUG) propose five major categories that are relevant while designing websites for business: content (relevance, media use, depth/breadth, current information), ease of use (goals, structure, feedback), promotion, made-for-the medium (community, personalization, refinement), and emotion (challenge, plot, character strength, pace).

Nielsen (1993) defines usability in terms of learnability, efficiency, memorability, and user errors.

*Figure 2. Website usability components
(Flavian et al, 2006)*



Website Usability Is a Determinant of the Online Buying Experience

Kuosmanen et al. (2010) indicate that a website must be usable among others it has to allow the internet users to find information quickly and easily. Therefore, greater levels of the usability will be associated with a greater ability of the users to control what they are doing.

According to Davis (1989), usability is considered a key factor in predicting intention to use systems. Useful and easy websites reduce asymmetric information, process information effort, improve the degree of online trust, and positively influence purchase intention (Hsu et al, 2012). A usable website helps users acquire more information and makes the information easier to find. Thus, a key challenge in building a usable website is to develop a good navigational structure and appropriate hyperlinks (Venkatesh, 2000).

Example: Minimalism has been a popular website design style for years. Designers arrived in the era of clean web designs. The idea is to find the equilibrium

between graphic elements, space, and content. It is a real art to create an attractive minimal design for websites.

Natan is a Belgian haute couture house that presents on its homepage a single model image that visitors can discover by clicking on it. Visitors can discover the rest of the collection as they visit.

A usable website creates more positive attitudes toward online stores and increases revisit rates, whereas websites with low usability can not maintain users. Lee and Kozar (2012) list usability problems that websites must reduce: difficult-to-understand content, inconsistent formats, difficulty in navigation, disorientation, lack of interaction and reliability, inefficient search capabilities, and ill-defined help functions. Developing usable websites is essential for firm success since online consumers touch, feel, search, and experience products mainly through websites. A usable website increases stickiness and revisits rates, and eventually stimulates online purchase (Lee and Kozar, 2012). Moreover, website quality (navigation content usability responsiveness) is a trust-building lever in the online context (Qureshi et al, 2009).

Example: “Tolerant” search engines that accept misspelled queries and load speed are popular with consumers because they reduce frustration.

Motivational theories like self-determination theory present an integrating framework that explains the use of technology. User behavior can be determined by two basic types of motivation: intrinsic motivation and extrinsic motivation. Ease of use of technology is an extrinsic motivation that can push the user to try it. The benefits that result can be the efficiency and performance gain for the user. Perceived pleasure can be considered as intrinsic motivation because enjoyment is the result of interaction with the system. For example, the user may visit a website to make a purchase or to compare products (extrinsic motivation) (Ryan and Deci, 2020; Sanchez-Frand and Roldan, 2005). In the case of intrinsic motivation, visiting the website itself is considered pleasant. This highlights the importance of experiential and hedonic website experience.

The Consumer’s Enchanting Experience and the Experiential Paradigm

The Internet has changed consumption habits by providing more ease in information search and product comparison. In addition to the greatest convenience, the Internet offers new consumer experiences. Thus, companies have to make their websites more attractive and richer by moving from the transactional perspective to the experiential

perspective. E-retailers built interactive websites that increase “stickiness” and positive evaluation to stand out from the clutter. (Franco Valdez et al, 2018).

Experiential experience is an unstructured, non-linear experience that does not have the primary purpose of seeking information. The consumer can also combine a useful information retrieval objective with a fun browsing objective on the website. He is attracted by the originality of the site, its interactivity, and its usability (Ha and Stoel, 2012)

The website stimuli (ease of navigation, clarity of the interface, color, sound, personalization, interactivity) seem to act on different levels of the user’s behavior. The main levels are the cognitive level (the evaluation and judgment of stimuli), the affective level (the set of irrational determinants that lead the consumer to appreciate or not a product/service and the conative level (conscious actions or behavioral intentions used as an indicator of behavior) (Sarkar, 2011).

Value creation can take on a less usable and more hedonic dimension. The website experience is an experience with strong emotional content. In addition to transactional motivations (purchase act), Internet users can have personal motivations (to keep abreast of news, to distract themselves) and social motivations (to create contacts, to express their belonging to a social group) (Anderson et al, 2014).

Website Interactivity

Steuer (1992) defines interactivity as “the extent to which users can participate in modifying the form or content of a website in real-time”. Interactivity enables real-time, two-way interactions among consumers themselves and between consumers and enterprises. Blattberg and Deighton (1991) view interactivity as interpersonal communication. Consequently, they define perceived interactivity as direct communication between two parties regardless of distance or time. Lowry et al (2006) present a broader definition of interactivity as any action a user or a website takes while a user is visiting a website whether is seeking specific information or just browsing.

Palmer (2002) argues that the perceived interactivity of the website is related to the ability to customize the appearance and content and interaction with the website manager and other users.

Example: Jumia, an electronic commerce platform, allows users to retrieve their last abandoned shopping basket and complete the purchase even after having stopped browsing.

The website allows users to achieve several objectives including entertainment, exploration, communication, and learning. Users not only search the Web for

specific information, but they also surf it for entertainment and to socialize. The search for specific information is the result of goal-directed need, whereas surfing the Web for other purposes is the result of the experiential need of users. Hirschman and Holbrook (1982) describe consumers as either “problem solvers” or in terms consumers seeking “fun, fantasy, arousal, sensory stimulation, and enjoyment”. Many motivations exist for shopping goals, but the most known motivations are utilitarian and hedonic motivations (Huang, 2003, Venkatesh, 2000).

Consumers with utilitarian motivations buy products in an efficient and timely manner to achieve their goals. Hedonic users visit the website for fun and pleasure. The Internet is an effective channel to deliver experiential value to consumers. Beyond presenting a variety of products, the online store can engage consumers in captivating experiences like the flow experience (Jeong et al, 2009; Hsu et al, 2012).

While some consumers may be shopping primarily for instrumental purposes, others may be enjoying these interactive media. Both factors can ultimately affect their attitude toward using interactive forms of shopping (Orwall 2001; Childers et al, 2001).

Example: Consumers’ expectations have shifted to require an optimal digital experience that mirrors the typical level of quality service they receive offline. Expectations have risen so high that companies who want to improve their products are changing their strategy to address this need directly. The retail industry is adopting an omnichannel strategy that integrates the sensory experience of offline stores and the convenient experience of digital apps and stores (Park and Yoo, 2020).

Gamification is an opportunity explored by companies. Gamification is a technique that creates a game-like experience online for websites that are not actual game applications. This technique appeals to the user’s competitive nature and the love of mystery and accomplishment.

Orange allows users of its application to download a game of several levels which is very marked by the local culture (morphology and dress style of the character) inspired by the game known worldwide as “Super Mario”. This game allows winners to receive gifts.

Samsung creates user-generated content by rewarding users for getting engaged with the community, participating in discussions with other users, watching videos, reviewing products, and doing other activities. In exchange for their participation, users are awarded badges and progress through levels of achievement. Gamification creates a sense of delight and achievement for users, creates a funnel for information or user data back to the site, and boosts engagement and brand loyalty.

Website Interactivity Dimensions

Facets that come up repeatedly during the conceptualization of interactivity are two-way communication is defined as “the possibility of establishing two-way communication between users and the company and between users themselves” (Mollen & Wilson, 2010). Two-way communication is a bi-directional flow of communication between the communicators (Kim, 2011).

The second facet is ‘synchronicity. It refers to the degree of simultaneity between the user request and company response. Synchronicity indicates the timing of information exchange; a more concurrent or simultaneous exchange between two entities is a more synchronous interaction than an exchange with a long lapse between responses (Yoo et al., 2010). Finally, the third aspect relates to the control exerted by a user over the navigation. Controllability describes the user’s ability to choose the timing, and content of communications (Dholakia et al, 2001).

Interactivity is a characteristic of computer-mediated communication that increases bidirectionality, timeliness, mutual controllability, and responsiveness of the interaction. For instance, interactivity makes the website personalizable. The ability to customize websites is an important design characteristic because it helps users save time and find relevant information. The Internet has the potential for interactivity, customization, personalization, convenience, etc. Hence, e-tailers try to enhance interactivity by proposing various communication features: bulletin boards, real-time chats, search engines, etc (Wu, 2019).

DAP decor is a company that specialized in exhibitions (Showrooms, booths). The website presents the various offers of the company with dynamic photos that scroll on the page. The user can zoom in on the photos to see the details. The dynamic aspect of a website is an essential element of its interactivity that enriches the user’s experience.

In addition to these three main components, sociability is a newly emerging component of interactivity. It represents the capability to allow users to connect with other people through chat rooms, blogs, and social networking tools (Macias, 2003).

Customizability has also been proposed in studies on interactivity. It reflects the extent to which products can be tailored to meet the unique requirements of each user.

Example: Amazon uses what it knows about a visitor’s last purchase to create a deeper relationship and provide useful information, as well as new offers.

Example: Travel websites usually present visitors with promotions based on the current weather or season.

Many companies face reluctant users who do not agree to deliver personal information causing a shortfall in personalized shopping, especially for a product

that is location dependent. Online shoppers are notoriously protective of the sort of personal information required to personalize their shopping. However, the numbers show that many of them are willing to open up about their preferences if they know that it will improve their shopping experience.

Huang (2003) added three components for interactivity:

- Responsiveness: the degree to which a site is perceived to respond to users' needs. E-mail is a technology that attributes showing responsiveness.
- Personalization: the extent to which a site is perceived to provide information personalized to the unique needs of each user. For example, the use of information-filtering agents to provide users with personalized information achieves this purpose. We see this in popular sites such as My Yahoo! which allows the user to change the colors of his email account and add his photos. Website Personalization is creating customized experiences for visitors to a website. Rather than providing a single experience, website personalization allows companies to present visitors with unique experiences tailored to their needs and desires.

Example: Curated retailing in fashion is a trend that is developing in the USA and Europe. It allows the consumer to have personalized advice from the salesperson and benefit from the online shopping convenience.

-Navigability: the extent to which a website is perceived to have unrestrained connectedness to other websites allowing easy information retrieval. Hypertext will enable visitors to jump, with minimal effort, from one point in cyberspace to another.

The elements of websites that increase interactivity are chat rooms, chatbots, and animations showing the time required to download pages. These tools increase the responsiveness and synchronicity of websites. Tools that increase perceived user control integrate search engines, website maps, and links.

Figure 3. Website interactivity
(Hood et al, 2015; Fiore et al, 2005)



Website Interactivity as a Determinant of the Online Buying Experience

To reduce the impact of the absence of direct contact between consumer and seller, companies have to respond to customers' inquiries and requests positively and responsively to enhance interactive communication (Ye et al, 2017).

Adami (2014) presents an example of website interactivity. Users can provide feedback (commenting on or rating a given text) or transfer a text to others (sharing or forwarding). Digital content has anchors, such as links, buttons, and fields, which enable users to act upon the text. Interactivity is crucial because it makes it easier for users to process information by eliminating or reducing unnecessary information. In addition, interactivity allows the user to organize information he wants to process to save time and guide his search.

The theory of media richness of Lengel et al., (1984) states that face-to-face communication is the richest and that email is considered a relatively poor mode of communication. Rich media are social media that implement and emit complex signals (gesticulation, intonation) and the reception of feedback. Indeed, the richness of the medium describes its capacity to influence comprehension in a fixed time interval. An interactive website is a richer medium than advertising posters or television commercials.

To summarize, website interactivity allows to:

- generate effective communication outcomes.
- a process of more information.
- provide consumers with the ability to organize the information by facilitating the cognitive process.

According to Wu (2019), interactivity is a key factor of website quality that motivates browsing and shopping. However, the author emphasizes that interactivity cannot guarantee the website's success. The success of a website depends on creating an optimal consumer experience where multiple external and internal stimuli play a fundamental role.

The Symbiotic Approach

Researches on web user behavior have a dominant paradigm that considers the user an agent of acceptance who decides to use the technology based on perceived characteristics and user satisfaction. According to Jaccuci et al, (2015) symbiotic paradigm, computers and humans are capable of working in sole unity. Hence, the user's performance is enhanced as the computing systems recognize or affect his

emotions and detect his goals which is the main difference from prior user-centered paradigms.

The symbiotic approach allows for overcoming the cleavage between user and technology introduced by the previous approaches. This approach uses the notion of symbiosis to understand the relationship between user and website by considering it as a mutual dependence where the two parties influence each other reciprocally and coherently (Neff and Nagy, 2018).

Brangier et al (2010) explain that symbiosis is a borrowed term from the natural sciences, referring to mutual and reciprocal influence. Technologies have gone from being an external artifact to being a “symbiote” that follows human evolution in all fields of life. The symbiotic approach helps to understand how technology is continually adapting to human development and also to identify how humans are shaped by technology.

The Online Anthropomorphism and the Social Dimensions of the Website

Companies are facing a growing problem of standardizing websites. Almost all websites contain the same sections and sometimes have the same aspect. To differentiate themselves from their competitors, some companies have tried to cultivate symbolism via anthropomorphism on their websites. Anthropomorphism is the attribution of human-like characteristics and intentions to nonhuman agents (Epley et al., 2007). When applied to the online landscape, online anthropomorphism uses avatars capable of showing emotions to improve the perceived website’s quality. However, online anthropomorphism may raise concerns about excessive or unethical data collection and usage (Xie et al, 2020).

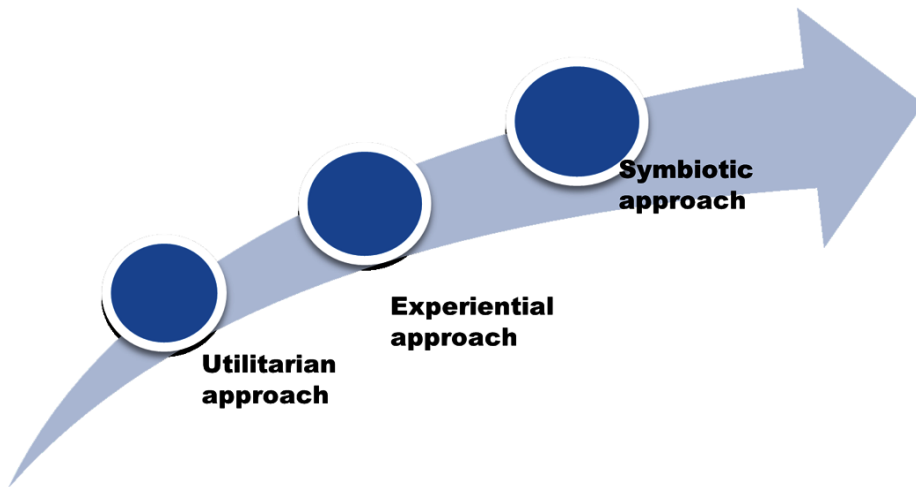
The empowered consumer can search for information, compare products and prices, interact with other consumers and the website manager, and buy the products without leaving his personal space. Consumers experience the Internet as a commercial and social space. The interactional potential of the Internet strengthens its status as a socialization agent (Lee et al, 2003; Wang et al 2012).

Example: Integrating sharing buttons on social networks next to each product on the website increases the brand visibility by facilitating the user’s interactional tendency.

Companies have long focused on improving website quality to attract, satisfy and retain consumers. Website quality is not the only lever of users’ attraction who are overwhelmed by the flow of information. Website personality is a new development

axis for companies for differentiating and forging a unique identity.(Poddar et al, 2009, Leen et al, 2010).

Figure 4. The paradigm shift in website design



The website interacts with consumers by offering the possibility of chatting with other consumers or with the site manager, providing recommendations, and providing secure payment mechanisms. Through these dimensions, a website tries to imitate the physical experience of traditional outlets (Jain and Yadav, 2018).

Social response theory posits that users treat computers as social actors even when they know that machines do not possess human traits. The use of social cues (i.e., language, voice, interactivity) on retail websites induced perceptions of socialness (i.e., the website was helpful, informative, polite), which in turn led to positive consumer response to the sites (Wakefield et al, 2012).

Example: Some companies are using anthropomorphic agents or avatars that possess human traits such as faces with the ability to speak. An agent is a computer-controlled character and an avatar is a user-controlled character. These virtual assistants can answer questions and perform tasks through conversational dialogue with users. A popular example of a virtual assistant is Anna who answers questions about IKEA products. She can show emotions if she can't find the information that the user is looking for.

Website Personality Construction

Consumers interact with brands as if they were humans. Brands can exhibit characteristics and human-like traits (Das, 2014). According to Aaker (1997), product-related factors (price, advertising style) and non-product-related factors (CEO, employees, endorsers) form brand personality. In online sitting, a brand has manifold opportunities for expressing its personality through its websites (Pamuksuz et al, 2021).

Brand personality includes five traits: Sincerity captures traits such as down-to-earth, cheerful, sincere, and friendly. Excitement describes traits including, young, trendy, imaginative, unique, and independent. Competence encapsulates traits such as intelligence, reliability, security, and success. Sophistication is characterized by traits including upper-class, glamorous, charming, and good-looking. Finally, ruggedness includes traits such as masculine, tough, and outdoorsy (Aaker, 1997; Pamuksuz et al, 2021).

Website personality is a mental representation based on dimensions similar to the dimensions of the human personality. The dimensions used to describe website personality are to a large extent similar to those used to describe store personality (Chen and Rodgers, 2006).

Poddar et al (2009) indicate that the concept of website personality is closer to the concept of store personality developed by D’astous and Levesque (2003) which define store personality as “the mental representation of a store on dimensions that typically capture an individuals’ personality”. The authors propose five dimensions for the website personality namely, enthusiasm, sophistication, genuineness, solidity, and unpleasantness.

Website personality is built through indirect interaction with online consumers. The website design (color, music, video, and animation), the richness of content, ease of use, navigation speed, and convenience participate in website personality formation (Lal and Katole, 2021; Leen et al, 2010). According to Shobeiri et al (2015), website design should go beyond the development of an interface to create a creative and engaging website. Website personality is an effective tool to achieve these goals.

For example, websites implementing an avatar or virtual agent with a female voice were categorized as more proficient in the topics related to fashion. In contrast, websites with men’s voices were ranked more competent in sport-related topics. Thus a website can have an enthusiastic personality if it offers an atmosphere perceived as pleasant by the Internet users. This dimension results from the organization and colors of the website.

Similarly, the website can be perceived as sophisticated if consumers think that it is elegant, chic and whose structure is a little complicated. An authentic website is a

website whose interface involves reliability and trust. As a result, several websites' use and endorsement by certain government agencies attest to the reliability of the site (Shobeiri et al, 2015).

A solid website is a website that can manage transactions smoothly and professionally by offering a wide selection of products and facilitating the decision process. Finally, an unpleasant website is a website with a fade and irritating design. A poorly designed website can prevent the consumer from completing his purchases. (Poddar et al, 2009; Chen and Rodgers, 2006).

Many websites can fall into the trap of "sameness". A possible solution is to create richer interactive online experiences (Ex: Augmented reality that blends interactive digital content into the perceived physical environment of the consumer). Another alternative is to infuse websites with human-like traits such as anthropomorphic agents that exhibit emotions and presentation skills to create a unique online experience allowing to escape fierce competition (Shobeiri et al, 2015; Chilinsky et al, 2020).

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Website attributes are stimuli triggering user behavior. These attributes may cause approach or avoidance reactions. If the user appreciates his online experience, he will decide to continue his visit to discover the website and ultimately buy. On the contrary, a poorly-designed website can annoy the consumer or make him doubt, so he shortens the browsing and leaves the website.

Web 1.0 was a read-only space with static pages providing a little interaction between consumers but didn't allow interaction with the website. Through web 1.0, companies established an online presence focused on content delivery. Web 2.0 is the second generation of the web. It is a read-write space with bidirectional interaction. The essential difference between web 1.0 and web 2.0 is user participation in content creation. Web 2.0 with its flexible web design, allows creative creation, modification, and reuse of content. Web 2.0 includes participatory and social platforms based on user-centered technologies. In the era of web 2.0, companies capitalize on customer engagement to build long-term relationships by using social brand communities. Despite its advantages, web 2.0 must meet challenges related to privacy concerns, ethical issues, and intrusive technologies (Patel, 2013; Choudhury, 2014; Aghaei et al, 2012).

Faced with these challenges, the idea of a third generation of the web is gaining ground. Web3 or semantic web is a shift to a more decentralized web permitting creative data management. Web 3.0 uses metadata to understand and respond to consumer requests. The most known technologies of the web 3 are blockchain which includes concepts such as Token-based economy and cryptocurrencies. This new

shift offers a wide variety of options to consumers and companies to co-create a new consumer experience. Future research will analyze new modes of consumption in metaverses and how the different versions of the consumer (several avatars in several digital universes) can consume or buy differently (Almeida et al, 2013; Nath et al, 2014; Aghaei et al, 2012).

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KEY TERMS AND DEFINITIONS

Anthropomorphism: From the Greek word Anthropos for man, and morphe, form/structure) is the tendency to attribute human characteristics to inanimate

objects, animals, and others to help us rationalize actions. It is attributing cognitive or emotional states to something based on observation to rationalize an entity's behavior in a given social environment.

Computers Are Social Actors: This paradigm states that experienced computer users do in fact apply social rules to their interaction with computers, even though they report that such attributions are inappropriate. These social responses are not a function of deficiency, or sociological or psychological dysfunction, but rather are natural responses to social situations.

Controllability: The user's capability to choose the timing, content, and sequence of communication.

Customizability: Reflects the extent to which products and/or services can be tailored to meet the unique requirements of each user.

Gamification: The use of game design elements and application of them to other web properties to increase engagement.

Hedonic Attributes: Include curiosity, entertainment, visual attraction, escape, intrinsic enjoyment; hanging out, relaxation, self-expression, enduring involvement with a product/service, role, best deal, and social.

Sociability: The site's capability to allow users to connect with other people through chat rooms, blogs, and social networking tools.

Synchronicity: Refers to the site's ability to provide users with fast response, real-time feedback, and messages and transaction processing speed.

Two-Way Communication: The two-way information flow which enables the user to respond back.

Utilitarian Attributes: Include the desire for control, autonomy, efficiency, broad selection & availability, economic utility, product information, customized product or service, ease of payment, home environment, lack of sociability, anonymity, monetary savings, convenience, and perceived ease of use.

Website Interactivity: Consists of two-way communication, synchronicity, controllability, sociability, and customizability.

Website Personality: The mental representation of a website store on dimensions that are similar to and reflect the dimensions of human personality.

Website Usability: Related to users' perception of the functional and instrumental qualities of websites. It refers to the website's controllability and effectiveness and highlights navigability and organization of information.

Chapter 3

A Conceptual Framework of the Challenges and Benefits of Social Customer Relationship Management

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ABSTRACT

Recent years have witnessed a significant change in the experiences and interactions of customers in various industries due to the remarkable development and the significant impact of information technology and social media on consumer behaviour. This prompted all organisations to focus on social customer relationship management (Social CRM) which is mainly aiming at personalising such experiences and interactions. Despite the notable evolution in social CRM scientific research, however, limited attention has been paid to clearly demonstrate the essential influencers and challenges of social CRM as well as its associated benefits for businesses. To this end, the current work aims to provide a deeper understating in relation to social CRM and its related key challenges and benefits. This research develops an integrated theoretical framework of the major challenges and benefits to adopting social CRM, leading to substantial theoretical and practical contributions to concerned entities.

DOI: 10.4018/978-1-7998-9553-4.ch003

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INTRODUCTION

Although a reasonably new communication channel, the web has already seen many generations and sustained the mighty speed of technological enhancement (Almeida, 2017). It is an accepted fact that technological advancements have brought about a lot of changes in human lives. More specifically social media has been influencing various facets of personal and professional relationships (Di Virgilio et al., 2022a). Business organisations are also adapting themselves to this gigantic wave of change brought about by social media that is associated with customer relationship management (CRM). To reinforce their sustainability, businesses have intensified their reliance on information (Hıdıroğlu, 2020). The technologically savvy customers partake in social media communities to exchange information about the services or products of an enterprise. This outlook has changed the conventional approach towards managing customer or product information (Buttle, 2009). Wereda & Woźniak (2019) observe that contemporary establishments are emphasising on fostering effective and long-term connections with clients. This helps in improving the organisation-customer interface while functioning as a persuasive technology in business.

In addition, such advancements have led to technological developments consolidating various business models, thereby encouraging organisations to adapt their strategies based on the evolving digitised ecosystem. Consequently, organisations are able to increase and enrich their competencies in extracting information and knowledge from customers (Saura & Bennett, 2019). The swift diffusion of knowledge and information has been allowing companies to improve their efficiency as well as to offer new products and services to their customers. Maecker, Barrot and Becker's (2016) research shows the encouraging role of social media interactions for organisations helps them in managing their brands and customers, developing suitable metrics and recognising various opportunities in the social media context.

To improve and maintain relationships with customers, companies adopt CRM strategies (Paliouras & Siakas, 2017). CRM is an inclusive strategy that enables organizations to identify, acquire, retain and nurture profitable customers by building and maintaining long-term relationships with them (Chen & Ching, 2007). A successful CRM strategy is based on three main factors; who is the target audience, the value of the relationship for the organization and the customer, and system and software to implement strategies (Paliouras & Siakas, 2017).

The traditional system in managing customer relationships is based on studying the target audience and focusing on what it needs for the marketing campaign to come to fill the gap. But, now, the gap is getting bigger because customers are looking for the best through what they share on social media sites and not through a one-way communication system (Taylor et al, 2018). Social media has posed a very big challenge in managing relationships with customers. The number of social

media users has increased dramatically. In 2021, there are around 4.66 billion internet users' clients on the planet out of the 7.83 billion global population. Of which, 92.6% access the internet utilizing cell phones. The assessed worldwide infiltration is at 59.5% in 2021 (Lambert, 2021).

Social CRM is considered one of the crucial factors in organizations and their reputation among customers/users of social media, which in turn enhance customer engagement and loyalty (Malthouse et al., 2013). It is evident that The Covid-19 pandemic has caused disruptions in various sectors across the globe (Hassan & Soliman, 2021; Soliman et al., 2021); compelling the organisations to adapt themselves to new practices so as to offer products and services through digitised channels. In fact, the pandemic accelerated the digital transformation and elevated its significance (Almeida et al., 2020). According to Irge & Yalçın (2020), the outbreak of pandemics demonstrated that physical or human mobility would decrease while intensifying digital communication is it in professional or social interaction. This shows that technology-driven communication can be identified as the latest strategy to ensure competitiveness and sustenance of the organisation in the industry. Hence social CRM enables relationship building with the existing customers and the future customers too (Hassan et al., 2019).

Although there are various studies that have been conducted to investigate the key issues related to social CRM among different contexts and settings. However, to the best of our knowledge, there is no prior known research that has developed a comprehensive model to illustrate the essential challenges to adopting social CRM as well as the benefits of its adoption. Based on the aforementioned discussion, the current work seeks to develop an integrated theoretical framework of the main challenges and benefits of social CRM by analysing the scientific production in the field of social CRM. In doing so, we have gathered and analysed 120 documents related to social CRM that has been published in academic journals indexed in the Scopus database.

BACKGROUND

As the approval and acceptance of social media platforms intensify, they convey a message that such digital technologies are gaining success due to their usage in the personal, social, and professional life of individual users (Rauniar, 2014). Technology infrastructure is therefore desirable to enhance and manage relations with customers. According to Barry et al., (2011) customers engaging with companies over social media are more loyal and spend up to 40% more with those companies than other customers. One of the major effects garnered by social media is the involvement of customers in the process of value co-creation either through reviews or in the form

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of user-generated content (Dewnarain, Ramkissoo & Mavondo, 2019). Social media also influences brand communities through various elements of a customer-centric model like relationships between focal customer and brand, product, company and other customers along with an effect on brand trust and loyalty (Laroche, Habibi & Richard, 2013).

According to Sinha & Fukey (2021), the absence of ‘digital visibility’ by small and medium enterprises hamper their reach to potential customers. Growth possibilities may be hindered as traditional advertising may go unnoticed. Consequently, many small and medium enterprises are realising the importance and strength of social media and progressing towards enhancing their presence in society. Social media enables those SMEs with inadequate resources to use it as an affordable marketing tool to reach the global market with minimal costs and efforts (Marolt et al., 2020). Technology-infused social media aids e-commerce as a catalyst and innovation in developed and developing countries to enhance the entrepreneurial characteristics of SMEs. In this regard, social media networks such as Facebook, WhatsApp, Twitter, Skype and other similar platforms facilitate the management of customer relationships due to their user-friendly features and compatibility with mobile devices (Hassan, Haniba & Ahmad, 2019).

Mangold and Faulds (2009) proposed three practices of social CRM namely: exploring customer opinions, using social networking sites, and integrating social networking content with customer-oriented processes. Four classic public relations models have been identified by Grunig & Hunt (1984), namely, press agency/publicity, public information, two-way asymmetric, and two-way symmetric. In the two-way symmetric model, they advocate free and equal information flow between an organisation and its public, which leads to mutual understanding and responsiveness. This may result in initiating the organisation, and/or its public being persuaded to change their position. But the model is regarded as equally effective if neither group changes, “as long as both communicate well enough to understand the position of the other” (Grunig & Hunt 1984, p.23). This model may be correlated to the present-day scenario where organisations seek to establish and maintain relationships with their customers. Goldenberg (2015) states that organisations investing in online presence via social media tend to respond and join conversations. This approach draws the customers when a business organisation reaches out to them rather than the reverse and also facilitates two-way communication.

Social media sites have contributed to many political, economic and social transformations. They have made people more aware of what is behind the scenes in all areas (Lee & Ma, 2012). Social media have become an increasingly important part of the lives of people today. They changed people’s lifestyles for good; where they can easily connect through social networking sites (Paliouras & Siakas, 2017). This development makes the internet a shared platform between customers and businesses.

This is more apparent with the existence of social media in which customers are generating their own content. That leads to virtual communities among customers that are built on collaboration and trust (Wasko & Faraj, 2005; Bajaj et al., 2022).

On social media, users share their different real experiences in all fields, easily and quickly by presenting real experiences (Wasko & Faraj, 2005; Chen, Xu, & Whinston, 2011), sometimes documented by audio and video. Therefore, many customers consider these experiences to be more credible than marketing campaigns. So, the customer's behaviour today with using social media networks is constructed by two interrelated elements; information and empowerment.

- *Information:* Social media contributed to altering customers' behaviour starting from one main strength point seeking and obtaining information (Voramontri & Klieb, 2019). Consequently, customers became much aware of the plans and tricks behind the marketing scene. Thus, Brown (2004) called the term marketing literate to the customers at this time because they are familiar with advertising techniques and they are capable of dissecting advertising campaigns in double-quick. The easy way to share and disseminate information among customers contributes to the changing the way of the purchase decision-making process (Zhang et al., 2014). Basically, the intention of buying products is based on the perceived usefulness (PU) in online reviews; the positive reviews will make the intention to buy stronger (Purnawirawan, Pelsmacker, & Dens, 2012; Zhang et al., 2014).
- *Empowerment:* Customer's ability to find out the information about products from other customers without the need to inquire about producers, limited the companies' control on information dissemination (Mangold & Faulds, 2009; Kim & Kim, 2022; Nemati & Weber, 2022). So, the customers today are empowered with information about what exactly they need to know. Vollmer and Precourt (2008) describe this new tendency in their book, *Always On: Advertising, marketing, and media in an era of consumer control*, as follows: 'consumers are in control; they have greater access to information and greater command over media consumption than ever before' (Vollmer & Precourt, 2008, p. 5)

The enlightenment and empowerment caused by using social media by customers contributed to changing their reception and reaction to the market information (Singh, Veron-Jackson, & Cullinanec, 2008). Obtaining the right information about their needs makes them reach the stage of satisfaction before making a purchase decision (Voramontri & Klieb, 2019).

SOCIAL CRM: CONCEPT, CHALLENGES, AND BENEFITS

The Concept of Social CRM

Social CRM is a new concept that includes strategies, processes and technologies to merge social media tools with CRM methods (Reinhold & Alt, 2011). Due to social media, the customer approach and market scenario have changed. The new customers are having more power to pick up products that exactly fit their requirements and budget. They are accessing several social media platforms for reviews and campaigns related to the products. Now, it is not only about approaching the customers but it is also to learn more about them. This takes the CRM to a higher level that is social CRM. Greenberg (2010) defined Social CRM is as:

A philosophy and a business strategy, that supported by a technology platform, business rules, workflow, processes and social characteristics, designed to engage the customer in a collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment (Mosadegh & Behboudi, 2011, p. 66).

Drawing on the work of Choudhury and Harrigan (2014), it can be extracted that social CRM reinforces the concept that the customers are partners in the decision-making process. Currently, to a big extent, the principle of social CRM is based on the fact that the success or failure of organizations can be measured directly and transparently on social sites. Accordingly, the concept of social CRM includes two main components as follows (Choudhury & Paul Harrigan, 2014):

1. Interactivity/ engagement: a) direct interaction with customers in real-time, and b) strong relations with customers
2. Immediacy: a) quick response to any complaints, and b) instant reward

Based upon the aforementioned discussion, social CRM can be defined as a business-orientation strategy to strengthen the relationship with customers and engage the institution with individuals on social media platforms to be an influential party in the purchase decision-making process.

CHALLENGES OF SOCIAL CRM

Extant literature discusses social CRM from multidirectional perspectives. Based on this, some of the palpable challenges are discussed in this section. They are

categorised into four segments (Table 1) which are: organisational; technological; employee-related; and customer-related challenges.

Organisational Challenges

Customer pressure is considered to be one of the major challenges on social CRM adoption intention by organisations (Barry et al., 2011; Ramadan & Eleyan, 2021). However, Ahani et al., (2017) observe that the customers' demands and behaviour can be considered as a productive challenge that motivates the institution to meet their expectations. Social media are used as a tool to ease interactions with customers, but they come at a cost. The organisation may have to undertake investments for various tasks, such as external consultation, building social media sites or applications (Ahani et al., 2017; Maecker et al., 2016; Meyliana et al., 2016). It is seen that when a new system or technology is introduced in the organisation, how will the management, employees and customers react and familiarise themselves with it (Chaudhuri et al., 2020; Woodcock, Green & Starkey, 2011). Jermisittiparsert et al., (2018) and Reinhold & Alt, (2012) examine the integration of social media applications to develop capabilities to maintain and monitor successful customer relationship management and performance. Maecker et al., (2016) and Reinhold & Alt, (2013) deliberate the uncertainty to assess whether the companies investing to establish and maintain their social media image are actually able to meet their high expectations to develop and retain customers. According to Ngo et al., (2021), social media can create an opportunity or challenge for organisations to be more productive in their business processes. Woodcock, Green & Starkey (2011) identify project management failings as one of the hurdles in social CRM. Few more aspects like 'unofficial' company representation (Baur et al., 2016); special and loving care for customers (Hart & Kassem, 2012); customer retention (Yahav et al., 2020); pressure to engage customers (Baird & Parasnis, 2011); organisational resilience (Helmold et al., 2022); the reduced amount of interpersonal interaction (Charoensukmongkol & Sasatanun, 2017) are also perceived as challenges.

Technological Challenges

Lack of technical knowledge about the usage of various digital platforms may impact the company in various ways (Ahani et al., 2017; Sinha & Fukey, 2021; Yasiukovich & Haddara, 2021; Yawised et al., 2017). Key issues in social CRM may pertain to privacy and control too (Baur et al., 2016; Guha et al., 2018; Woodcock et al., 2011), along with data management (Guha et al., 2018; Liu et al., 2017), data extraction, analysis and storage (El Fazziki et al., 2017; Lamrhari et al., 2022); data protection

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(Woodcock et al., 2011); big data analytics (Perera et al., 2018) and text mining (Alt & Wittwer, 2014).

Employee-Related Challenges

Rathore et al., (2016) identify the shortage of sufficient and skilled manpower in order to acquire skills of social media technologies. Lack of resources can pose a challenge in social CRM (Guha et al., 2018). At the same time resistance towards change hinders in managing relationships with customers in the light of using social media (Pour & Hosseinzadeh, 2021).

Customer-related Challenges

According to Baur et al., (2016) and Goldenberg (2015) organisations need to learn to lessen the impact of negative posts on social media platforms, as it may damage the reputation of the organisation. Overhype and over-expectation (Woodcock, Green & Starkey, 2011). Another challenge is of linking social and CRM data that may generate multiple identities of customers (Woodcock et al., 2011). Lack of time (Yawised et al., 2017); the speed of responses (Baur et al., 2016) and information overload (Sima et al., 2020).

Table 1. Challenges of social CRM

Categories	Types of Challenges	Source
Organisation	Customer pressure	Ahani et al., 2017; Barry et al., 2011; Ramadan & Eleyan, 2021
	Investment cost	Ahani et al., 2017; Maecker et al., 2016; Meyliana et al., 2016
	Organisational readiness	Chaudhuri et al., 2020; Woodcock, Green & Starkey, 2011;
	Social media monitoring, management and performance	Jermisittiparsert et al., 2018; Reinhold & Alt, 2012;
	Organisational performance	Ngo et al., 2021
	Project management failings	Woodcock, Green & Starkey, 2011
	Uncertainty	Maecker et al., 2016; Reinhold & Alt, 2013
	'unofficial' company representation	Baur et al., 2016
	Special and loving care for customer	Hart & Kassem, 2012
	Customer retention	Yahav et al., 2020
	Pressure to engage customers	Baird & Parasnis, 2011
	Organisational resilience	Helmold et al., 2022
	Less interpersonal interaction	Charoensukmongkol & Sasatanun, 2017

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Table 1. Continued

Categories	Types of Challenges	Source
Technology	Lack of knowledge	Ahani et al., 2017; Sinha & Fukey, 2021; Yasiukovich & Haddara, 2021; Yawised et al., 2017
	Privacy and control	Baur et al., 2016; Guha et al., 2018; Woodcock et al., 2011
	Data management	Guha et al., 2018; Liu et al., 2017
	Data extraction, analysis and storage	El Fazziki et al., 2017; Lamrhari et al., 2022
	Data protection	Woodcock et al., 2011
	Big data analytics	Perera et al., 2018
	Text mining	Alt & Wittwer, 2014
Employee-related	Management support	Ahani et al., 2017; Chatterjee et al., 2020; Marolt et al., 2018
	Skilled manpower shortage	Rathore et al., 2016
	Lack of resources	Guha et al., 2018
	Resistance towards change	Pour & Hosseinzadeh, 2021
Customer-related	Negative comments	Baur et al., 2016; Goldenberg, 2015
	Multiple identities	Woodcock et al., 2011
	Overhype and over expectation	Woodcock, Green & Starkey, 2011
	Lack of time	Yawised et al., 2017
	Speed of responses	Baur et al., 2016
	Information overload	Sima et al., 2020

BENEFITS OF SOCIAL CRM

The progression seen in social media platforms is a big contribution to the fast-evolving technology that creates distinctive user experience (Dewnarain et al., 2019). They are categorised into four categories (Table 2), namely organisational; technological; employee-related; and customer-related benefits.

Organisational Benefits

Social CRM networks that are dynamic are considered to have a positive impact on the company performance (Alamsyah & Utami, 2018; Foltean et al., 2019; Wang & Kim, 2017). Social media has a tremendous ability for companies to have a close bonding with their customers thereby facilitating revenue generation (Baird & Parasnis, 2011; Baur et al., 2016; Jamieson, 2014; Sinha & Fukey, 2021). It has been observed by Al-Gasawneh et al., (2021) and Charoensukmongkol & Sasatanun (2017) that social CRM can enhance business (financial) performance (Diffley et al., 2018; Kim & Wang, 2019). Ahani et al., (2017) and Marolt et al., (2018) note

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that the intensity of adopting social CRM positively influences the institution. Activities conducted as a part of social CRM become a major source of organisational knowledge creation (Durgam & Sinha, 2014). Proper utilisation of digital tools for identifying, anticipating, managing and winning the business competition (Sarkum & Syamsuri, 2021). Technology aided sentiment analysis helps organisations to plan their marketing strategies (Dini et al., 2017; El Fazziki et al., 2017; Li et al., 2012). Organisations are benefited from social CRM in terms of customer retention (Arora et al., 2021); customer segmentation (Czyszczon & Zgrzywa, 2013) thereby creating customer lifetime value (Baur et al., 2016; Jamieson, 2014). The other benefits are: outreach to the community (Baur et al., 2016); branding (Yahav et al., 2020); direct and immediate contact with the customer (Reinhold, & Alt, 2013); enhancement of innovation activities (Diffley et al., 2018); influences followership (Carlson & Lee, 2015); cost reduction (Baird & Parasnis, 2011); trust (Jacewicz & Cho, 2015); mutual understanding between company and customer (Jacewicz & Cho, 2015); creates an organisational environment (Chatterjee et al., 2020); creates a competitive advantage (Baur et al., 2016) and helps start-up businesses (Hasani et al., 2017). According to Lamrhari et al. (2022), social CRM creates an opportunity for decision makers to evaluate customer data that further aids in introducing customer centered and productive strategies.

Technological Benefits

Social CRM helps in effective management of information (Jamieson, 2014; Kantorová & Bachmann, 2018; Marolt et al., 2018), opinion mining (El Fazziki et al., 2017; the customer gets the benefit of choosing from a variety of communication channels (Arora & Sharma, 2018); ease of use (Ramadan & Eleyan, 2021); data access (Baur et al., 2016); ability to answer dynamic queries interactively (Jadeja & Shah, 2015); and technological adoption (Gamage et al., 2021).

Employee-Related Benefits

Chatterjee et al., (2020) have observed that employee performance is motivated by management support thereby positively impacting the use of social CRM. It is also seen to empower customers (students) to contribute in the teaching and learning processes (Anshari et al., 2015), and also improve sustainable service quality (Hassan et al., 2019).

Customer-Related Benefits

Social CRM enables organisations to plan various initiatives for boosting customer engagement (Barry et al., 2011; Choudhury & Harrigan, 2014; Dewnarain et al., 2021; Gu, 2017; Hidayanti et al., 2018; Ivan & Popa, 2015; Kantorová & Bachmann, 2018; Medjani & Barnes, 2021; Orenge-Roglá & Chalmeta, 2016; Pour & Hosseinzadeh, 2021; Swarts et al., 2016; Wang & Kim, 2017; Woodcock, Green & Starkey, 2011; Woodcock et al., 2011; Yawised et al., 2017; Yasiukovich & Haddara, 2021); enhancing customer relationship (Baabdullah et al., 2018; Cirqueira et al., 2017; Hidayanti et al., 2018; Jacewicz & Cho, 2015; Kim & Wang, 2019; Marolt et al., 2018; Meyliana et al., 2016; Sigala, 2018); customer empowerment (Aldaihani & Ali, 2018; Goldenberg, 2015; González-Rodríguez et al., 2016; Hassan et al., 2019; Woodcock, Green & Starkey, 2011); customer satisfaction (Arora et al., 2021; Baur et al., 2016; Orenge-Roglá & Chalmeta, 2016; Swarts et al., 2016). It has also been examined that social CRM encourages customer loyalty (Arora et al., 2021; Baur et al., 2016; Jacewicz & Cho, 2015; Singhal et al., 2018) and values co-creation (Hidayanti et al., 2018; Küpper, 2014; Lehmkuhl & Jung, 2013; Yasiukovich & Haddara, 2021). In contrast to the traditional way of connecting with the customers, social CRM creates a platform for customer involvement (Cheng & Shiu, 2019) with a higher frequency of communication (Baur et al., 2016) through effective communication (Kraeva & Emilova, 2014; Marolt et al., 2018) to take place in various ways like a social interaction (Anshari & Almunawar, 2012; Ennaji et al., 2015; Jacewicz & Cho, 2015); electronic word of mouth also known as eWOM (Baur et al., 2016; Singhal et al., 2018); two-way communication (Jalal et al., 2019; Korombel & Ławińska, 2019) and social collaboration (Alavi, 2016; Küpper, 2014; Rodrigues, 2012; Sinha & Fukey, 2021). This social engagement (Alavi, 2016) can influence other customers through positive reviews (Guha et al., 2018) that takes place due to information access (Almunawar & Anshari, 2014). Some of the other customer-centric benefits are loyalty rewards (Ivan & Popa, 2015); better customer service (Wittwer, 2017) which may result in creating brand loyalty (Dewnarain et al., 2021) which further leads to customers' identity with the brand (Alt & Reinhold, 2012).

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Table 2. Benefits of social CRM

Categories	Types of Benefits	Source
Organisation	Monetary benefit / revenue generation	Baird & Parasnis, 2011; Baur et al., 2016; Jamieson, 2014; Sinha & Fukey, 2021
	Improved company performance	Alamsyah & Utami, 2018; Foltean et al., 2019; Wang & Kim, 2017
	Higher satisfaction with business performance	Al-Gasawneh et al., 2021; Charoensukmongkol & Sasatanun, 2017
	Improved financial performance	Diffley et al., 2018; Kim & Wang, 2019
	Management support	Ahani et al., 2017; Marolt et al., 2018
	Organisational knowledge creation	Durgam & Sinha, 2014
	Identifying, anticipating, managing and winning business competition	Sarkum & Syamsuri, 2021
	Outreach	Baur et al., 2016
	Branding	Yahav et al., 2020
	Direct/immediate customer contact	Reinhold, & Alt, 2013
	Enhance innovation activities	Diffley et al., 2018
	Followership	Carlson & Lee, 2015
	Customer lifetime value	Baur et al., 2016; Jamieson, 2014
	Cost reduction	Baird & Parasnis, 2011
	Trust	Jacewicz & Cho, 2015
	Mutual understanding	Jacewicz & Cho, 2015
	Organisational environment	Chatterjee et al., 2020
	competitive advantage	Baur et al., 2016
	Start-up businesses	Hasani et al., 2017
	Customer retention	Arora et al., 2021
	Customer segmentation	Czyszczoń & Zgrzywa, 2013
	Evaluate customer data	Lamrhari et al., 2022
Technology	Effective information management	Jamieson, 2014; Kantorová & Bachmann, 2018; Marolt et al., 2018
	Opinion mining	El Fazziki et al., 2017
	Customer deciding communication channels	Arora & Sharma, 2018
	Ease of use	Ramadan & Eleyan, 2021
	Competitive advantage	Baur et al., 2016
	Data access	Baur et al., 2016
	Answer dynamic queries interactively	Jadeja & Shah, 2015
	Technological adoption	Gamage et al., 2021
Employee-related	Participate in teaching learning process	Anshari et al., 2015
	Leadership; Management support	Chatterjee et al., 2020
	Improve sustainable service quality	Hassan et al., 2019

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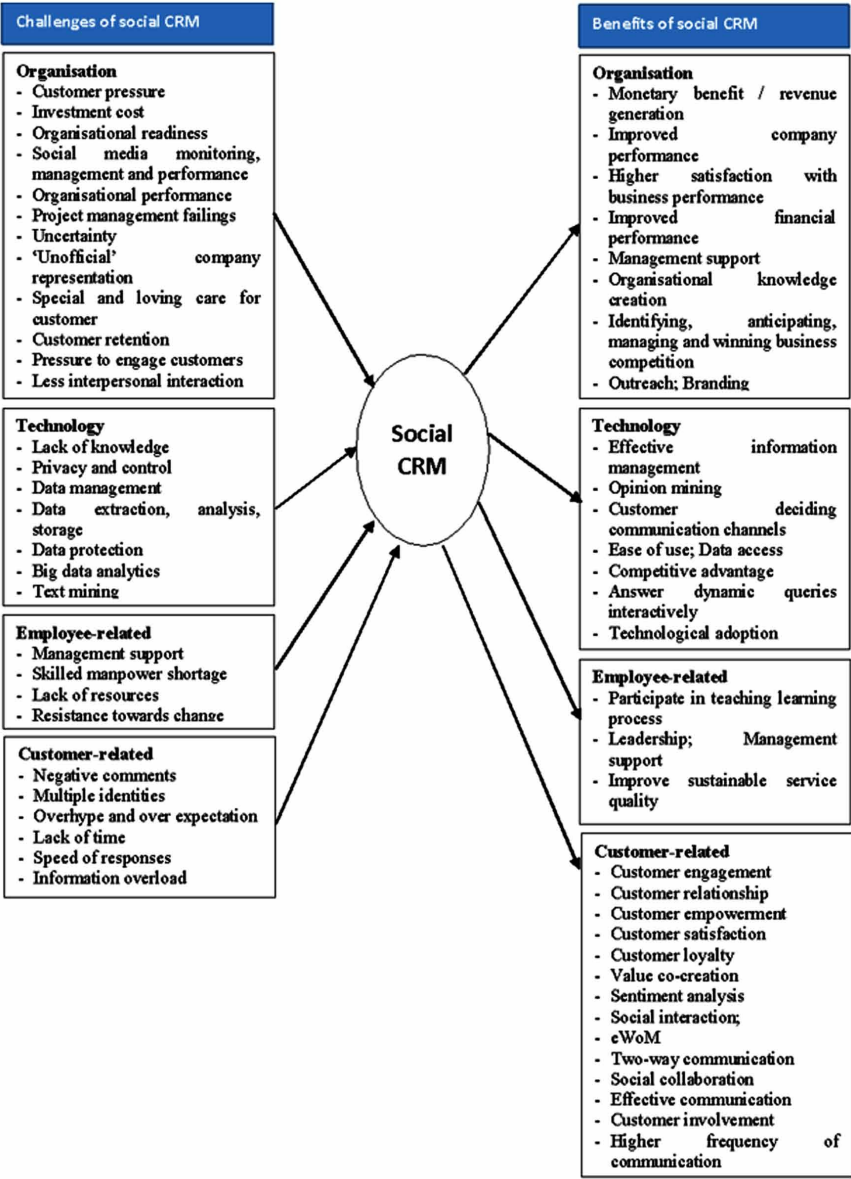
Table 2. Continued

Categories	Types of Benefits	Source
Customer-related	Customer Engagement	Barry et al., 2011; Choudhury & Harrigan, 2014; Dewnarain et al., 2021; Gu, 2017; Hidayanti et al., 2018; Ivan & Popa, 2015; Kantorová & Bachmann, 2018; Medjani & Barnes, 2021; Orenge-Roglá & Chalmeta, 2016; Pour & Hosseinzadeh, 2021; Swarts et al., 2016; Wang & Kim, 2017; Woodcock, Green & Starkey, 2011; Woodcock et al., 2011; Yawised et al., 2017; Yasiukovich & Haddara, 2021.
	Customer Relationship	Baabdullah et al., 2018; Cirqueira et al., 2017; Hidayanti et al., 2018; Jacewicz & Cho, 2015; Kim & Wang, 2019; Marolt et al., 2018; Meyliana et al., 2016; Sedalo, 2022; Sigala, 2018
	Customer empowerment	Aldaihani & Ali, 2018; Goldenberg, 2015; González-Rodríguez et al., 2016; Hassan et al., 2019; Woodcock, Green & Starkey, 2011
	Customer Satisfaction	Arora et al., 2021; Baur et al., 2016; Çalik, 2022; Orenge-Roglá & Chalmeta, 2016; Swarts et al., 2016;
	Customer Loyalty	Arora et al., 2021; Baur et al., 2016; Çalik, 2022; Jacewicz & Cho, 2015; Singhal et al., 2018
	Value co-creation	Hidayanti et al., 2018; Itani et al., 2022; Küpper, 2014; Lehmkuhl & Jung, 2013; Yasiukovich & Haddara, 2021
	Sentiment analysis	Dini et al., 2017; El Fazziki et al., 2017; Li et al., 2012
	Social interaction	Anshari & Almunawar, 2012; Ennaji et al., 2015; Jacewicz & Cho, 2015
	eWOM	Baur et al., 2016; Singhal et al., 2018
	Two-way communication	Jalal et al., 2019; Korombel & Ławieńska, 2019
	Social collaboration	Alavi, 2016; Küpper, 2014; Rodrigues, 2012; Sinha & Fukey, 2021
	Effective communication	Kraeva & Emilova, 2014; Marolt et al., 2018
	Customer involvement	Cheng & Shiu, 2019
	Higher frequency of communication	Baur et al., 2016
	Loyalty rewards	Ivan & Popa, 2015
	Better customer service	Wittwer, 2017
	Social engagement	Alavi, 2016
	Influence other customers through positive reviews	Guha et al., 2018
	Information access	Almunawar & Anshari, 2014
	Customer identity with brand	Alt & Reinhold, 2012
	Brand loyalty	Dewnarain et al., 2021

Figure 1 reveals a comprehensive model of challenges and benefits of social CRM

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Figure 1. A proposed model of the key challenges and benefits of social CRM



Social CRM Strategy

It has become imperative for companies to create a good perception that helps them compete in the virtual world that is led by the customers. The task here is to understand the customer and provide what will improve the reputation among social

media users. So, adopting social CRM helps organizations to engage more with customers (Malthouse et al., 2013; Vivek, Beatty, & Morgan, 2012). Thus, social CRM customer strategy and associated business models are those characterized by customer engagement, not customer management (Greenberg, 2009; Jami Pour & Hosseinzadeh, 2021). Integrating social media into CRM enables organizations to build a complete picture of the success of the social marketing strategy. Customer interactions on social media can be clearly linked to business results, such as purchase or contribution rates (Newberry, 2021).

When a customer engagement strategy is effective with the successful support of social CRM tools and processes, there is a mutually derived benefit planned from the start. That success is defined by a fundamental shift within the relationship between the company and also the customer from producer-client to partners. This is often a serious cultural and behavioural change in how the purchasers interact with an organization. If they sense themselves as partners, they feel that they have contributed to the success of the organization. That will generate mutual respect and loyalty (Greenberg, 2009). Therefore, this pattern is based on the integration between the customer and the organization to create a common environment in which everyone benefits.

Social CRM pushes organizations to have open two-way communication. Consequently, clients become dynamic members constructing brands. Marketing departments may be keen to produce a variety of content about the products of their organizations on various social media sites. This may not be sufficient, as they should follow up on what is being circulated and shared between individuals and influencers on those social sites. Thus, social media influencers may be used to create awareness about an organization to engage it in social media conversations (Salesforce Learning Centre, 2021).

The main steps in the customer engagement model of social CRM, include the following concepts: Customer Relationship Orientation, Relational Information Processes and Social CRM Technology Adoption (Paliouras & Siakas, 2017). That is based on different approaches to understanding the customer needs and demands through closed bonds using social media networks (Chen & Ching, 2007; Yildirim, 2022). The success of the company to gather the required information can rebalance the relationship between the customer and the company leading the company to have strategic communication (Chen & Ching, 2007; Paliouras & Siakas, 2017).

This is not at all an easy task, where millions of users use social media sites to send and receive information about everything and anything. The efforts of organizations have to be asynchronous action with what is going on in the virtual world. This requires capabilities in analysing digital content and the availability of the related analytical tools. This shift requires the accessibility of social tools and services, social media provided by the firm externally; external and free accessible

social media, and external, but access restricted social media (Reinhold & Alt, 2011; Sarner, et al., 2011). Accordingly, the social CRM strategy is extending the strategies of CRM to integrate social media as a leading factor in the company's strategy to rebuild trust with customers. Therefore, in addition to the requirements of CRM strategies, social CRM requires integration with society and a two-way communication strategy with customers.

CONCLUSION

The present chapter aims to provide a solid overview concerning the concept and significance of social CRM as well as represent an integrated conceptual framework of the major challenges and benefits to adopting social CRM within different domains and settings. To this end, we have reviewed and analyzed all scientific production in the field of social CRM published in journals indexed in the Scopus database during the period from 2010 to 20 February 2022. This includes 120 documents. It is evident that the challenges of social CRM could be classified into four main categories (i.e., organisational; technological; employee-related; and customer-related challenges). Similarly, there are four categories of the benefits of social CRM (i.e., organisational; technological; employee-related; and customer-related benefits). The current work does hold substantial contributions to both concerned scholars and practitioners by developing a comprehensive conceptual model including the essential challenges and benefits of social CRM.

FUTURE RESEARCH DIRECTIONS

There are various directions for further research. To begin with, future research is recommended to conduct an empirical study to investigate the main challenges of social CRM adoption within a specific domain. A cross-sectional study is suggested to provide in-depth insights on the topic. Similarly, we suggest future research to empirically examine the major benefits and/or consequences of social CRM adoption among businesses. Moreover, further work can develop and examine a comprehensive structural model of the key determinants and outcomes to apply social CRM. Furthermore, in order to present a broader overview and obvious understanding related to social CRM, future research is required to carry out a consolidated bibliometric analysis including a number of techniques such as evaluative metrics, relational measures involving networking analysis, and/or systematic review of big data on the current study theme. A content analysis of customers' loyalty and/or engagement towards social CRM activities, initiative, and/or strategies (e.g., Di

Virgilio et al., 2022b) could be a proper direction for future work. Additionally, it is recommended for future work to apply a qualitative research method/approach by conducting interviews with potential respondents in organizations belonging to a certain sector (e.g., tourism-related sectors, hospitality-related sectors, banking sector, etc.) to clearly produce thorough insights concerning the main challenges and advantages of social CRM adoption within their enterprises.

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Chapter 4

Towards Integrating the Customer–Supplier Relationship in Perceived Value Conceptualization

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ABSTRACT

Value is a fundamental concept in relationship marketing (RM). The company's ability to create value for its customers is seen as the most successful competitive strategy. The effervescence created by this subject in the scientific community and the diversity of proposed meanings and approaches have led to a theoretical confusion around this concept. In this chapter, the authors tried to study the concept of value through an extensive and eclectic literature review. They particularly attempted to focus on the perceived side of this concept, as the customer point of view is the primary concern for companies that are marketing oriented. The developments lead us to consider the customer-supplier relationship as a source of enrichment for the concept of perceived value. From there, it is better to talk in RM about "perceived relationship value" (PRV) rather than "perceived value." PRV is then presented as a key integrative concept to build a successful customer-supplier relationship.

DOI: 10.4018/978-1-7998-9553-4.ch004

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INTRODUCTION

Given the dynamics of economic development and the rapid changes in customer preferences, it is becoming increasingly difficult for companies to maintain their market share (Noyan and Simsek, 2014). This reality is more relevant in the service markets in which harsh competition and complex market dynamics push companies to look for more efficient customer retention strategies (Ting Pong and Tang Pui, 2001).

Several studies have been carried out in order to identify means to help companies keep customers and gain their loyalty (Ting Pong and Tang Pui, 2001; Pan, Sheng and Xie, 2012; Noyan and Simsek, 2014; Leppäniemi, Karjaluoto and Saarijärvi, 2017; Gunawan Bata, Adbul Razak, Hasmin, Heriyanti and Yusriadi, 2021). Perceived quality and customer satisfaction have often been considered as central factors in retention strategies in the field of services (Taylor and Baker, 1994; Fornell, Johnson, Anderson, Cha, and Bryant, 1996; Oliver, 1999; Zeithaml, Berry and Parasuraman, 1996; Vanhamme, 2002). However, some researchers showed that while quality and satisfaction remain necessary for firms to be competitive, they are no longer sufficient to provide a real competitive advantage (Woodruff, 1997; Dodds, 1999; Swaddling and Miller, 2002; Filser, 2008). In fact, analysis of consumer behavior shows that customers often proceed to assessment before they take a decision and seem to be prone to use an upstream assessment criterion. Indeed, they compare the benefits and costs of each offer and choose the one that maximizes benefits as compared to costs (Parissier, 2003). The concept of perceived value has thus become at the heart of the decision making process (Anderson and Fornell, 2000; Sweeney and Soutar, 2001; Petrick, 2002; Eggert and Ulaga, 2002; Yang and Peterson, 2004; Lin, Sher and Shih, 2005). Several studies showed the positive influence of perceived value on loyalty (Parasuraman and Grewal, 2000; Rivière and Mencarelli, 2012; Gunawan Bata *et al.*, 2021).

The main objective of this chapter is to attempt to grasp the essence of the concept of perceived relationship value by analyzing the literature on it. To do so, the authors first need to deepen the understanding of the concept of perceived value in general by analyzing the different approaches developed in the literature to study it. This literature review would offer an integrative vision on the concept of perceived relationship value, which is a necessary step towards a consensual definition of this concept.

WHAT DOES “VALUE” MEAN?

Although widely investigated in marketing, the concept of value remains difficult to define (Parissier, 2003). In fact, “Value” is a “polysemic” word: “Consumer value”

(Lai, 1995), “Customer value” (Woodruff, 1997; Dodds, 1999; Anderson, Narus and Van Rossun, 2006), “Perceived value” (Zeithaml, 1988), “Lifetime value” (Venkatesan and Kumar, 2004), “Desired value” and “Received value” (Flint, Woodruff and Gardial, 2002), “Expected value” (Hogan, 2001), “Added value” (Mason, Doyle and Wong, 2006), “Relationship value” (Ulaga and Eggert, 2006), *etc.*

However, this does not imply a total absence of congruence between these different “values”. Basically, it can be apprehended through two angles of view (1) from the point of view of the company: the value of the customer for the company (“Lifetime value”), and (2) from the point of view of the customer: the value delivered by the company as perceived by the customer (“Perceived value”, “Expected value”, “Added value”, “Desired value”, “Received value”, “Relationship value”, *etc.*).

The value of customers for companies is closely related to their weight in terms of turnover, which stands as an indicator to assess marketing decisions (Battberg and Deighton, 1996) and develop customer-centric marketing. Value is defined as direct and potential profits based on the difference between the revenue generated throughout the business relationship with a customer and the costs incurred to attract, satisfy and retain them (Ayache, Calciu, Fradon and Salerno, 2006). Firms tend to identify their most profitable customers (Gupta, Hanssens, Hardie, Kahn, Kumar, Lin and Siriram, 2006) to retain them and increase their purchases. They can therefore improve their market segmentation and optimize their marketing budgets through differentiated methods according to the potential lifetime value of their customers (Gupta *et al.*, 2006; Borle, Singh and Jain, 2008).

Firms will in turn be called to offer the best value that their customers require. The concept of value is here defined as “*an explicit promise made by a company to its customers that will deliver a particular amount of value creating benefits*” (Hassen, 2012). But, this delivered value could be perceived differently by customers. This is the reason why firms must absolutely understand how customers perceive the value of their offer.

WHAT DOES “PERCEIVED VALUE” MEAN?

This expression refers to the value of a product or a service from the consumer’s perspective (Woodruff, 1997). Despite the importance of the concept of perceived value in marketing, it is difficult to find an agreement on a common definition (Day, 2002). This probably results not only from the ambiguity of the terms used to define it, but also from its evolution and the diversity/multiplicity of approaches used to examine it (Marteaux, 2007; Rivière, 2009). To clarify the concept of perceived value, the authors will first present its evolution and second identify the different approaches followed to study it.

Customer Value and Consumer Value

The literature on perceived value usually distinguishes between two notions: customer value and consumer value (Marteaux, 2007; Rivière, 2009).

Customer Value

Customer value found its origin in the Utility theory and is anchored around utilitarian value or exchange value. For economists, the customer develops a rational behavior to optimize the utility. The marketing approach inspired by this economic theory replaced the utility function by the value function. Under this theory, called *prospect theory* by Kahneman and Tversky (1979), perceived value is defined in terms of the perceived gains and losses as compared to reference points that can change from one situation to another (Thaler, 1985).

Research on perceived value continued to develop with Bettman's (1979) information-processing model. This line of research sees the customer as being a logical agent who is able to solve problems when making a purchase. From this perspective, perceived value results from a cognitive trade-off between what is given and what is received, a give-get ratio. Perceived value is then related to a pre-purchase rational and purely cognitive approach (Parissier, 2003).

As for Zeithaml (1988), perceived value is defined as the overall utility of a product assessed by confronting what is received in terms of quality to be obtained to what is given in terms of price to be paid. Building on the basic definition of Zeithaml (1988), Zeithaml and Bitner (2000) proposed a further definition of perceived value for the service sector. It refers to the overall assessment of the utility of a service traded against the customer's perceptions of what is received and given.

Some authors have however criticised the limited and simplistic nature of this vision, which has often reduced "what is received" to quality and "what is given" to price (Schechter, 1984; Bolton and Drew 1991).

In order to enrich it, some other authors proposed to integrate additional dimensions of "gain" and "loss" in perceived value. Mazumdar (1993) stated that customers who are aware of the value of products are less and less impressed by the quality of the product and less and less convinced by the lowest price. They pay more attention to the benefits obtained compared to the costs incurred in purchasing a product (Parissier, 2003). As a result, the more inclusive terms "profits"/"benefits" and "sacrifices"/"costs" have replaced those limited of "gains" and "losses".

What is received in terms of perceived benefits consist of a combination of physical and intangible attributes, available technical support or after-sale services, price, brand or store brand or other indicators of perceived quality (Ravald and Grönroos, 1996; Aurier, Evrard and N'Goala, 2000).

What is given in terms of costs incurred by the buyer include perceived monetary and non-monetary sacrifices. Monetary sacrifices are price, transport costs, installation, ordering, repair, maintenance, *etc.* (Ravald and Grönroos, 1996). Non-monetary sacrifices are time and/or the efforts made to consume the product waiting time, time needed for interaction with staff members, information retrieval, psychological costs (misunderstanding), *etc.* (Pieters, 1989 ; Zeithaml and Bitner, 2000).

It should be stressed here that price intervenes in this equation as a benefit in terms of perceived quality, as much as a sacrifice in terms financial amount required to purchase a product (Dodds, Monroe and Grewal, 1991).

Therefore, extending the dimensions of profit/benefits and costs/sacrifices beyond the simple notions of quality and price ratio made it possible to enrich the concept of perceived value. A summary of the definitions given of perceived value is presented in Table 1.

The evolution of these definitions provides an interesting framework based on both theoretical and managerial foundations, and which articulates in a global perspective the two dimensions of perceived benefits/profit (value-creating sources) and perceived sacrifices/costs (value-undermining sources) (Rivière, 2007).

Table 1. Illustrative contributions to defining the concept of perceived value

Authors	Definitions
Zeithaml (1988)	<i>"Perceived value is the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given"</i>
Lichtenstein et al. (1990)	<i>"We can define value as ratio of quality to price"</i>
Monroe (1990)	<i>"Buyers' perceptions of value represent a balance between the quality or perceived benefits of the product compared to the perceived sacrifice by the payment of the price"</i>
Dodds et al. (1991)	<i>"The cognitive tradeoff between perceptions of quality and sacrifice results in perceptions of value"</i>
Liljander and Strandvik (1993)	<i>"Perceived value equals perceived benefits/perceived price"</i>
Rust and Oliver (1994)	<i>"Value is some combination of what is received and what is sacrificed"</i>
Hunt and Morgan (1995)	<i>"Value refers to the sum total of all benefits that consumers perceived they will receive if they accept the market offering"</i>
Fornell et al. (1996)	Perceived value is <i>"the perceived level of product quality relative to price paid"</i>
Woodruff (1997)	<i>"Customer value is a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations"</i>

Continued on following page

Table 1. Continued

Authors	Definitions
Sinha and DeSarbo (1998)	<i>"Value is quality that the consumers can afford"</i>
Sirohian <i>et al.</i> (1998)	<i>"We define value as what you get for what you pay"</i>
Oliver (1999)	<i>"Value is a positive function of what is received and a negative function of what is sacrificed"</i>
Lapierre (2000)	<i>"Customer-perceived value can, therefore, be defined as the difference between the benefits and the sacrifices (e.g. the total costs, both monetary and non –monetary) perceived by customers, in terms of their expectations, i.e. needs and wants"</i>
McDougall and Levesque (2000)	<i>"Broadly defined, perceived value is the results or benefits customers receive in relation to total costs (which include the price paid plus other costs associated with the purchase). In simple terms, value is the difference between perceived benefits and costs"</i>
Oliva (2000)	<i>"Customer value is the hypothetical price for a supplier's offering at which a particular customer would be at overall economic break-even, relative to the best alternative available to the customer for performing the same set of functions"</i>
Slater and Narver (2000)	<i>"Customer value is created when the benefits to the customer associated with a product or a service exceed the offering's life-cycle costs to the customer"</i>
Kothandaraman and Wilson (2001)	<i>"Value is the relationship of a firm's market offering and price weighed by the consumer against its competitor's market offering and price"</i>
Van der Haarand <i>et al.</i> (2001)	<i>"The customer value concept assesses the value a product offers to a customer, taking all its tangible and intangible features into account"</i>
Walter <i>et al.</i> (2001)	<i>"We understand value as the perceived trade-off between multiple benefits and sacrifices gained through a customer relationship by key decision makers in the supplier's organization"</i>
Afuah (2002)	<i>"The value that a customer attaches to the characteristics is a function of the extent to which they contribute to the customer's utility or pleasure"</i>
Chen and Dubinsky (2003)	Perceived customer value is <i>"a consumer's perception of the net benefits gained in exchange for the costs incurred in obtaining the desired benefits"</i>
Rivière (2007)	Perceived value is defined as <i>"the difference between the total perceived value (generated by the value of the product, service, staff and the image) and the total cost to the consumer (consisting of the monetary cost, in time, in effort and psychological)"</i> .
Hansen <i>et al.</i> (2013)	<i>"Perceived value is a comparison between the ratio of what is given and what received (give-get ratio) that can be perceived as acceptable in one context and unacceptable in another"</i> .

Adapted from: Sanchez-Fernandez and Iniesta-Bonillo (2006).

While this largely improved conception of perceived value has been adopted by many researchers, it still suffers from a number of limitations. First, the computing method which is supposed to be used by customers to compare benefits and sacrifices (possibly taking the form of a ratio, a subtraction, a compromise, a compensation, or a trade-off) is rather ambiguous. In addition, providing a thorough listing of

sacrifices and benefits is difficult to achieve (Rivière, 2009). Consequently, the purchase value is still often limited to quality as a profit and price as a sacrifice. In fact, this approach fails to consider all the forms that perceived value can take, particularly for some products or services for which the assessment of non-economic value may depend on many subjective, psychological, or social factors (Marteaux, 2007). And lastly, according to Cova and Remy (2001), this conception of perceived value is too utilitarian as it considers that the customer believes that everything has a price, even emotions.

This led to the emergence of a second line of investigation bearing an experiential focus. With this new approach, research on perceived value has seen a deep change (Aurier *et al.*, 2000; Cova and Remy, 2001; Rivière, 2009). There is now reference to *consumer value*.

Consumer Value

According to Hirshman and Holbrook (1982), assessing purchase experiences is a complex process, which a simple utility-based objective approach cannot fully grasp. Accordingly, consumer behavior can no longer be reduced to the simple act of purchasing. It should, indeed, be extended to consider the entire consumption process (Aurier *et al.*, 1998). Perceived value is then considered a key variable in a general consumer experience model (Babin, Darden and Griffin, 1994). It is no longer the result of assessing a purchased product solely, but it is equally the outcome of the whole experience of purchasing and consuming the product (Holbrook, 1999; Filser, 2000). From this perspective, value is understood, from a cumulative point of view, as the sum of the interactions between the consumer, the product and the situation (Hirshman and Holbrook, 1982).

This approach was initially developed in Holbrook and Corfman's (1985) conception of "experiential consumption", defined as a subjective state of consciousness enriched by a variety of symbolic meanings, aesthetic criteria, and hedonistic responses. This type of consumption highlights the existence of consumer-related subjective states such as fantasy, emotions, and pleasure (Holbrook and Hirshman, 1982). Holbrook (1994, 1999) defined perceived value within this experiential framework as a relative preference (comparative, personal and situational) during the experience of a person with an object. Value is therefore neither totally subjective and individual-dependent nor totally objective and object-dependent. It refers to the interaction between a subject and an object. At this point, we are moving away from the idea of the universal value of a company's offer. In this regard, Gabriel (1996) stated that "*value moves away from the object or does not entirely belong to it, to get closer to the actor*". This value appears in a possession or consumption experience, which leads to consider not only the chosen product, but also the relationship that the consumer maintains with the

product beyond its tangible features (Petitpretre, 2008). Perceived value thus bears not only on the benefits and sacrifices during the product purchase experience, but also on the interaction between the consumer, the product (or service), the situation or the purchase context (Aurier *et al.* 1998, 2000). This stream of thought made it possible to develop the concept of perceived value (Parissier, 2003).

Holbrook (1999) categorized consumer value in a typology that distinguishes the three following complementary dimensions, crossed in pairs, relative to individual expectations from a product (Aurier *et al.*, 1998, 2000; Cova, and Remy, 2001; Parissier, 2003):

- The “extrinsic” dimension, in which priority is given to the functional dimension of the product that makes it possible to reach certain ends, versus the “intrinsic” dimension, which prioritizes the consumption experience that is appreciated as such.
- The “self-oriented” dimension, in which the priority in consumption depends on the personal interest of the individual, versus the “other-oriented” dimension, according to which priority relates to the effects of the consumption experience on the other persons surrounding the individual.
- The “active” dimension, in which the consumer manipulates an element of their environment, versus the “reactive” dimension, whereby the consumer apprehends and responds passively to an object.

According to this typology, consumer value can take one of the following eight forms (Table 2).

Table 2. The types of customer value

Value		Extrinsic	Intrinsic
Self-oriented	Active	Efficiency	Play
	Reactive	Excellence	Aesthetics
Other-oriented	Active	Status	Ethics
	Reactive	Esteem	Spirituality

Source: Holbrook (2005).

Thus, consumer value can be considered as a consumer’s emotional response to an object, ranging from the pure benefits of “efficiency” to the meanings given to life “spirituality” (Cova, and Remy, 2001).

Despite its conceptual richness, consumer value bears some limits. Indeed, this conception of perceived value holds some conceptual complexity because of its multi-faceted nature. This complexity makes the development of measurement instruments and field research difficult to achieve (Holbrook, 1994; Aurier *et al.*, 2000, 2004). Moreover, the above-identified dimensions of consumer value are neither exclusive nor exhaustive (Aurier *et al.*, 1998). Badot (2001, quoted by Cova and Rémy, 2001) showed that Holbrook's (2005) typology presents some classification difficulties and redundancies. Moreover, this conception of value does not take into account the costs that may be associated with product consumption (Rivière, 2009) and cannot be assessed globally (Aurier *et al.*, 2000, 2004). It is therefore not surprising to note that few studies have operationalized the concept of consumer value (Aurier *et al.*, 2000; Marteaux, 2007).

Customer Value vs. Consumer Value

Table 3 summarizes the main features that distinguish customer value from consumer value.

Table 3. Comparison of customer value and consumer value

	Customer Value	Consumer Value
Theoretical roots	Exchange value in Economics	Use value in economics
Moment of formation	Before buying the Offering	During or stemming from the consumption experience of the offering
Aim of the approach	Global approach (to obtain an overall score of value)	Analytical approach (to identify the content and components of value)
Label given to "value"	Benefit	Source of valorization, meaning and sense associated with consumption
Nature of the evaluation	Largely functional/utilitarian	Largely affective/ experiential/symbolic
Architecture of the notion	<ul style="list-style-type: none"> - Discrete design - Value as a trade-off between various perceived benefits and sacrifices 	<ul style="list-style-type: none"> - Factorial design - Value as intersection of the fundamental dimensions of experience

Adapted from: Rivière and Mencarelli (2012)

However, many questions remain unanswered. What is the link, if there is one, between the cognitive approach and the experiential approach (Rivière, 2009)? Is

there a “big global theory” of perceived value, or is it not better to be aware that there are two ways to apprehend it (Cova and Rémy, 2001)? Some researchers have tried to answer these questions. Alternative or integrative approaches to perceived value are discussed in the next section.

Integrative Approaches to Perceived Value

The traditional approach to perceived value, as adopted in marketing, encourages researchers to position themselves in either of two perspectives: customer value or consumer value. Trying to combine these two conceptions of perceived value has been the subject of several studies.

On the one hand, some authors argued that these two approaches are incompatible. The reason is the difficulty to settle the world of computing and interest with that of affection and emotion (Cova and Rémy, 2001). Actually, it is a matter of taking either side (Filser, 2000).

On the other hand, this dichotomous way of thinking seems distant from reality and unable to cover the whole concept of perceived value. New integrative approaches have been developed, allowing for a more complete representation of perceived value in marketing.

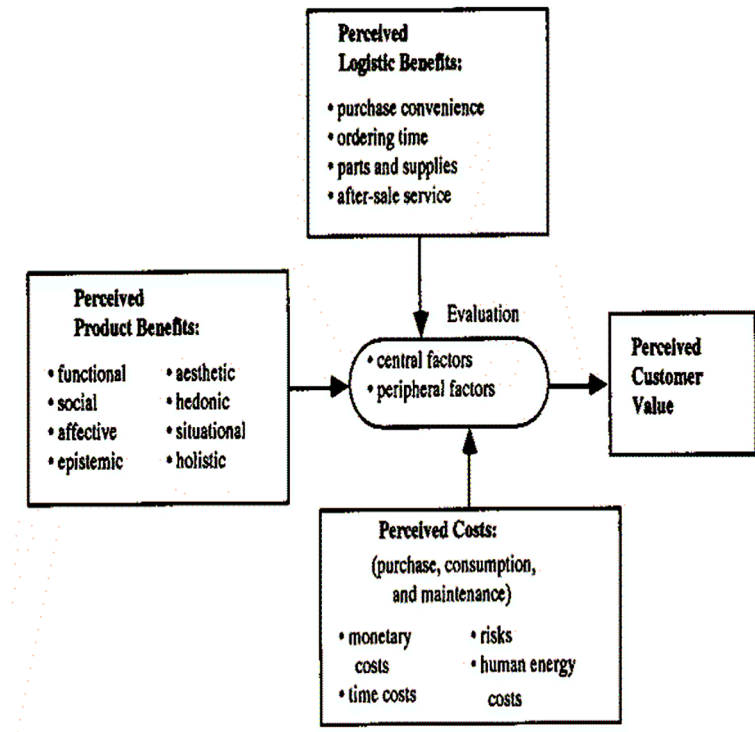
Mainly, five approaches tried to present a comprehensive and a detailed view of perceived value by adopting a conciliatory position between customer value and consumer value.

Lai's Approach (1995)

Inspired by the work of Seth, Newman and Gross (1991) on the importance of functional, conditional, social, emotional and epistemic values in the consumer choice behavior, Lai (1995) conceived perceived benefits and costs into a perceived value model (Figure 1).

Figure 1. A model of customer value for consumer market

Source: Lai (1995).



This perceived value model clearly integrates customer value (profits and sacrifices) and the types of benefits of consumer value (Table 4). It is therefore an approach that combines these two visions (Rivière, 2009).

Table 4. Definitions of perceived product benefits

Benefits	Definitions
Functional benefits	refer to a product's capacity for functional, utilitarian, or physical performance. Functional benefits are derived from the tangible and concrete attributes that a consumer may directly experience when using or consuming the product.
Social benefits	are the perceptual benefits acquired from a product's association with social class, social status, or a specific social group. Highly visible products (clothing, jewelry, and automobiles) often carry social benefits
Affective benefits	refer to the perceptual benefit acquired from a product's capacity to arouse feelings or affective states. Affective benefits are often associated with cultural-ethnic meanings or personal, idiosyncratic meanings, tastes and memories
Epistemic benefits	refer to the benefit acquired from a product's capacity to satisfy curiosity, provide novelty, and/or meet a desire for knowledge. Exploratory, novelty-seeking, and variety-seeking consumption behaviors are examples of epistemic value pursuit. Also, a consumer's propensity to adopt new products is consistent with epistemic benefits
Aesthetic benefits	refer to the benefits acquired from a product's capacity to present a sense of beauty or to enhance personal expression. Aesthetic benefits are usually subjective and idiosyncratic. Style demands, product-appearance demands, art purchases, and fashion-following are examples of consumers' pursuing aesthetic benefits
Hedonic benefits	are acquired from a product's capacity to meet a need of enjoyment, fun, pleasure, or distraction from work or anxiety. People are not always looking for rational or "serious" benefits; they may want to relax or be distracted.
Situational benefits	refer to the benefits acquired from a product's capacity to meet situational needs in specific circumstances. A product acquires situational value in the presence of antecedent physical or social contingencies that enhance its functional, social, or other benefits. Situational benefits are measured on the profile of a particular consumption situation
Holistic benefits	refer to the perceptual benefits acquired from the complementarity, coherence, compatibility, and consistency in a product constellation as a whole. Holistic product benefits result from a "synergetic" product combination

Adapted from: Lai (1995)

Parasuraman and Grewal's (2000) Approach

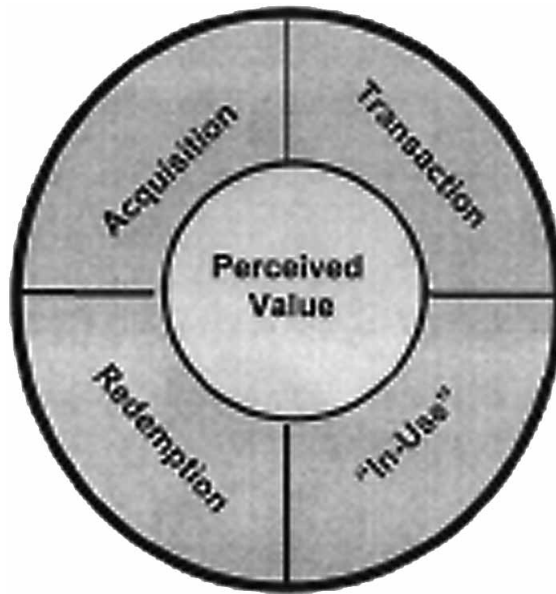
In this approach, the authors defined perceived value as a four-dimensional construct:

- **Acquisition value**, standing for the profits (seen against monetary sacrifices) that buyers believe to obtain through purchasing a product/service.
- **Transaction value**, drawn from the pleasure of having made a good deal.
- **In-Use value**, standing for the utility derived from the use of the product/service.
- **Redemption value**, which represents the residual profits at the time of purchasing a product or terminating a service.

The four dimensions of Parasuraman and Grewal's (2000) approach are illustrated in Figure 2.

Figure 2. The components of perceived value

Source: Parasuraman and Grewal (2000)



Perceived value is hence understood as a dynamic construct, with facets that can change over time. Thus, customer value and transaction value can dominate before or immediately after the purchasing act. Possession value and cash value become important, mainly during the last phases of a product/service consumption (Rivière 2009).

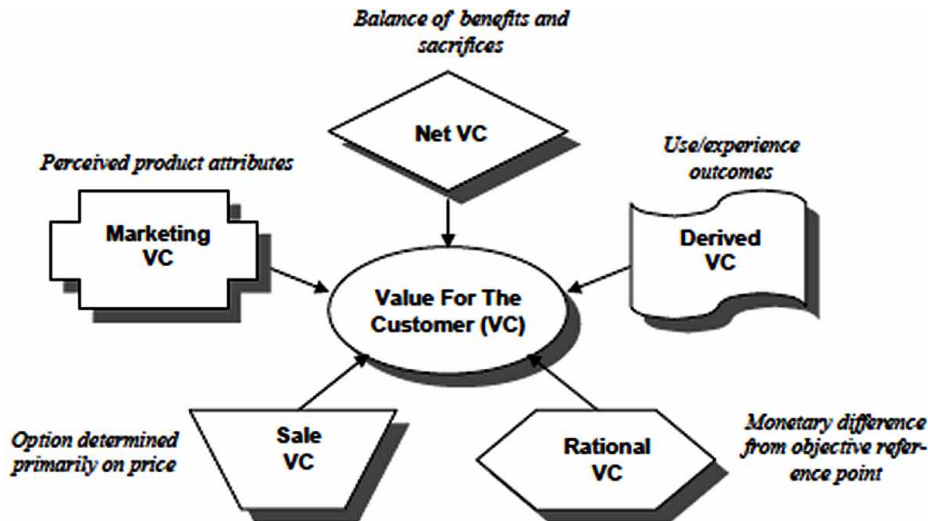
Woodall's (2003) Approach

For the sake of thoroughness and conceptual clarification, Woodall (2003) tried to provide a particularly detailed and precise view of the different facets of perceived value in marketing. He reviewed the concept from two perspectives:

- The primary forms: Woodall (2003) identified five primary forms of Value for the Consumer (VC): net value, derived value, marketing value, sale value and rational value (Figure 3).

Figure 3. Five primary VC forms

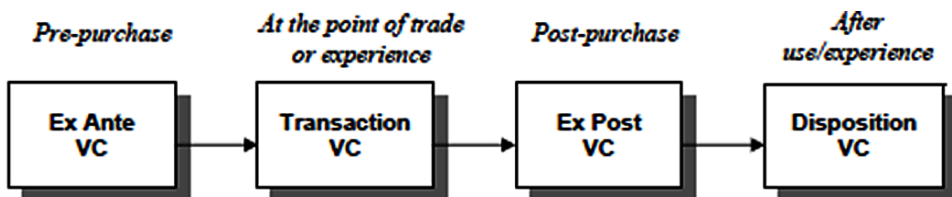
Source: Woodall (2003)



- The longitudinal perspective of perceived value: in this second perspective, the author adopted a time-span vision (Figure 4). It distinguishes possible conceptions of value referring to the four levels of the purchase process or the experience of a product/service consumption. This longitudinal perspective highlights the dynamic nature of perceived value (Rivière, 2009).

Figure 4. A longitudinal perspective on VC

Source: Woodall (2003)



These two perspectives do complement each other and allow for an accurate grasping of the essence of the concept of perceived value (Rivière, 2007).

Aurier et al.'s (2004) Approach

Drawing on the typology of Holbrook (1999), Aurier *et al.* (2004) attempted to classify the dimensions of consumer value and to integrate them, with perceived sacrifices, into a global definition of perceived value. The authors combined several approaches to consumer value into two sources of value: the intrinsic *vs.* extrinsic dimension and the self-oriented *vs.* other-oriented dimension (Table 5).

Table 5. Towards the integration of approaches of consumer value

		Holbrook (1994)	Holt (1995)	Lai (1995)	Richins (1994)	Evrard and Aurier (1996)
Self-oriented	Intrinsic	Play Aesthetic	Experience (emotion)	Hedonic Affective Aesthetic	Pleasure Appearance (beauty)	Hedonic Experiential stimulation
	Extrinsic	Efficiency Excellence	Integration (acquisition and use)	Functional (utilitarian) Epistemic	Utilitarian	Knowledge (information search, expertise)
Other-oriented	Intrinsic	Ethics Spirituality	Play (social practice and sharing)		Spiritual	Social practice
	Extrinsic	Status Esteem	Classification (social distinction)	Social	Status Self-expression Interpersonal links Self-realization	Self-expression Social link
Not classed				Holistic situational		

Adapted from: Aurier, Evrad and N'Goala (2004)

The current study made it possible to identify several families of consumer value dimensions: possession value, knowledge, experiential stimulation, self-expression, social bonds and finally spiritual value (Aurier *et al.*, 2004).

According to these authors, a product or service has value for an individual when it responds effectively to one or more functions (Aurier *et al.*, 2004). This conception, therefore, starts from consumer value and integrates sacrifices into a global definition of perceived value.

Marteaux (2007) studied multiple “perceived sacrifices”. In addition to price, the author tried to understand the specific impact of non-monetary sacrifices such as time, effort spent on information retrieval, convenience costs, psychological costs and perceived risk (anticipation) and subjective losses on the overall perceived value.

Amraoui's (2005) Approach

Based on a literature review and primarily inspired by Sweeney and Soutar (2001), Amraoui (2005) identified three dimensions of perceived value, namely economic value, emotional value, and social value (Table 6).

Table 6. The classification of perceived value

Values	Definitions
Economic value (quality / price ratio)	It includes the purchase value and the transaction value. This dimension corresponds to the perceived price and the valuation, in essentially monetary terms, of the purchase of the product. It reflects the customer's impression of paying a reasonable price. This dimension is especially important for sustainable products
Emotional value	It reflects the feeling of pleasure felt by the customer following the purchase of the product
Social value	It is the evaluation, made by third parties, of the purchase of a given product. It also corresponds to the image that the customer wishes to give of himself with the purchase of a particular product

Adapted from: Amraoui (2005)

This approach considered both rational perspectives (customer value) and experiential perspectives (consumer value). This accounts for determining perceived value through considering both rational and emotional dimensions (Rivière, 2009).

Table 7 summarizes the evolution of the concept in terms of the different approaches, and the different dimensions identified above. The semantic diversity of the concept of perceived value and the contexts in which it evolves result from the multiplicity of approaches.

These approaches disagree on some dimensions and agree on some others. However, all of them urge companies to try to increase the value perceived by their customers in order to maintain a long-term relationship with them. In this evolving perspective, some research works are considering an interesting approach that has not been explored yet: the relational approach to perceived value adopted with the development of relationship marketing. This approach will thus be presented hereafter.

Table 7. Synthesis of perceived value approaches

Definitions		
Traditional approach	Rational approach	This approach corresponds to the purchase value which is an essentially economic and cognitive vision of the perceived value
	Experiential approach	This approach corresponds to the value of consumption which is a more philosophical and affective appreciation of the perceived value.
Integrative approaches	Lai's approach (1995)	This "comprehensive" approach takes into consideration the various perceived benefits (product and logistical benefits) and the perceived costs in assessing the perceived value
	Parasuraman and Grewal's approach (2000)	In this approach, the perceived value is understood as a dynamic four-component construct: the acquisition value, the transaction value, the use value and the cash value.
	Woodall's approach (2003)	This approach attempted to clarify the different facets of perceived value from two perspectives: primary forms and longitudinal perspective
	Aurier et al. (2004) approach	It is an approach to perceived overall value that incorporates the components of consumer value and the sacrifices made.
	Amraoui's approach (2005)	It is a multidimensional approach that takes both functional and hedonic elements into appreciation of perceived value.

THE CONCEPT OF PERCEIVED RELATIONSHIP VALUE

The marketing interest drawn from building lasting relationships with customers is enhanced by, among other things, a significant increase in profit opportunities for the company (Anderson and Mittal, 2000; Henning-Turau and Klee, 2001) as well as for its consumers (Gwinner, Gremler and Bitner, 1998). As Anderson (1995) pointed out, *"value creation and sharing can be seen as the rationale for relationships between suppliers and customers"*. The relationship approach to value is thus inspired by the relationship paradigm, characterized by a long-term perspective and collaborative exchanges between suppliers and customers. This accounts for the rising number of studies dealing with value creation in customer-firm relationships (Ulaga, 2001; 2011; Ulaga and Eggert, 2002; 2006; Rivi re, 2007).

The aim of customer relationship management is to maintain and strengthen relationships and retain customers. This is possible through value-added services and the promotion of satisfaction, trust and strong social bonds (Patterson and Ward, 2000). By studying the strategies pursued by loyalty programs, Benavent and Meyer (2004) presented the strategies to manage customer-firm relationships. Increasing perceived relationship value is listed among these strategies. To this end, the firm seeks to establish a privileged learning relationship with its customers. This relationship is fed by a regular feedback from customers to better meet their specific needs facilitated by marketing 4.0 tools like social media, e-mails and the use of mobile devices (Edelman, 2010; Kotler, Hermawan and Iwan, 2017; Gunawan Bata *et al.*, 2021). Perceived relationship value therefore amounts to maintaining

this relationship beyond the intrinsic features of the product or service involved (Benavent and Meyer, 2004).

Despite the abundance of research on the notion of perceived value, it is clear that there is a lack of knowledge about the concept of perceived relationship value (Parasuraman, 1997; Ulaga and Eggert, 2002; Rivière 2009). The few studies that have dealt with this notion were mostly conducted in the industrial field (Wilson and Jantrania, 1993; Ulaga, 2001; Ulaga and Eggert, 2005). According to Wilson and Jantrania (1996), perceived relationship value is a concept that cannot be ignored, especially to understand the dynamics of supplier-customer relationships.

Perceived Relationship Value in B-to-B

Perceived relationship value has been more widely investigated in the service sector. The context in which perceived relationship value or relationship value has been studied is, therefore, that of a service “episode” between the customer and the service provider. An episode is a complete interaction between the two parties (from the beginning to the end of the interaction) in which several exchanges take place (Liljander and Strandvik, 1995).

At this level, the customer perceives two dimensions of service delivery: the “basic” service (consisting of the core of the service and the additional services promised by the provider) and the interpersonal process surrounding the service delivery (the way it is provided). According to Raval and Grönroos (1996), the perceived value of an episode cannot be assessed uniquely by the core service and the additional services. It should equally include the effort to maintain the relationship. The authors then spoke of the “total value of a service episode” which is a function of perceived episode value itself and perceived relationship value.

Perceived relationship value is, then, a compromise between the benefits and the sacrifices of the relationship, leading to a sense of security, credibility and continuity that would enhance trust between the customer and the provider.

According to Mencarelli and Rivière (2015), it is possible to distinguish between the transactional approach and the relational approach to perceived value in B-to-B. In the transactional approach, perceived value is appreciated, during an exchange, as “the cost-benefit ratio of the offer of a provider, perceived by the decision-makers of the organization in question” (Eggert and Ulaga, 2002). Hence, from a relational perspective, value springs directly from the customer-provider relationship. The relationship is then considered as a source of value creation, in the same way as supply (Raval and Grönroos, 1996; Lapierre, 2000; Keskar and Pranay, 2018). Perceived relationship value is thus appreciated by an aggregate and cumulative view of all the exchanges taking place between two companies (Hogan, 2000; Mencarelli and Rivière, 2015).

The definition of perceived relationship value raises several controversies and its conceptualization could vary according to the research context (Babin *et al.*, 1994). Thus, this relatively complex concept has been broken down in several ways in B-to-B marketing research. Wilson and Jantrania (1995) examined value creation in industrial buyer-supplier relationships and conceptualized perceived relationship value in three dimensions: (1) economic, (2) strategic and (3) behavioral. For Raval and Grönroos (1996), the total value of an episode is the ratio between the perceived benefits and sacrifices of the exchanges between the partners. It also takes into account the value created by the relationship beyond the exchange. Grönroos (1997) defined episode value as the value perceived by customers, described as the basic solution reinforced by additional services, divided by the price and the costs of the relationship. The author distinguished two dimensions for benefits and two dimensions for sacrifices.

The line of research presented above was limited to the conceptualization of the concept. Other studies aimed at developing the dimensions of perceived relationship value and validating them empirically. Werani (1998 cited by Ulaga and Eggert, 2002), for instance, distinguished four dimensions of relationship benefits (economic, strategic, related to the product and related to interaction with staff) and one dimension of relationship sacrifices (relationship costs). In a study conducted in the field of information and finance industries in North America, Lapierre (2000) identified thirteen dimensions of value in transactional and relationship perspectives, grouped as follows:

- Product benefits: (1) alternative solutions, (2) product quality and (3) product customization.
- Service-related benefits: (4) responsiveness, (5) flexibility, (6) reliability and (7) technical competence.
- Relationship benefits: (8) the image of the provider, (9) trust and (10) empathy shown to customers.
- (11) Price sacrifices
- Relationship sacrifices: (12) time / effort / energy and (13) conflict.

Finally, Ulaga and Eggert (2002, 2005, 2006) tried to propose new conceptualizations. They defined perceived relationship value in the B-to-B field as “a compromise between the benefits (product, service, know-how, time-to-market and social) and the sacrifices (price and procedure) in a relationship with the provider, as perceived by the decision maker of the organization, taking into account the possible relationship with the alternative provider”. Most subsequent studies used the conceptualizations proposed by these researchers in different fields such as, for

example, industrial relationships (Cater and Cater, 2009) or relationships between travel agencies and their suppliers (Ruiz-Molina *et al.*, 2015).

However, Lefaix-Durand *et al.* (2009) questioned the conceptualizations and measures proposed by Ulaga and Eggert (2005, 2006) and tried to propose an alternative conceptualization. Their progressive perspective amounts to considering the two parties in the customer-supplier relationship. Indeed, according to Lefaix-Durand *et al.* (2009), the conceptualizations of perceived relationship value proposed by Ulaga and Eggert (2005, 2006) measured “the value of the provider for the customer” and not “the value of the customer-supplier relationship”. According to these authors, the Ulaga and Eggert’s (2005, 2006) approach consists, indeed, in comparing suppliers. To overcome this limitation, they focused on the relationship between the exchange parties. They develop six dimensions of benefits (Products, Know-how innovation, time to market personal interactions services and delivery) and five dimensions of sacrifices (Direct costs, transaction costs, psychological costs, acquisition costs and operation costs). These conceptualizations vary considerably, prompting for more scrutiny and empirical research (Lyons and Brennan, 2019; Munksgaard and Frandsen, 2019).

Perceived Relationship Value in B-to-C

Studies that have examined the concept of perceived relationship value in the B-to-C field considered relationship benefits at the expense of sacrifices (Gwinner *et al.*, 1998; Henning-Thurau *et al.*, 2002). There is still no empirical research that jointly studied the benefits and sacrifices of the supplier-customer relationship (Dimitridis, 2011; Mencarelli and Rivière, 2015). Yet, the customer-supplier relationship is likely to last if both parties derive benefits that outweigh costs (Beatty *et al.*, 1996; Dimitridis, 2011). These two elements are supposed to be the dimensions of perceived relationship value proposed by Ravald and Grönroos (1996). Setting up an approach similar to that of Ravald and Grönroos (1996), Mencarelli and Rivière (2015) think that it would be interesting to take into account relationship benefits and sacrifices in the B-to-C context. Research on relationship benefits and sacrifices is presented in what follows.

Relationship Benefits in B-to-C

B-to-C research on relationship benefits referred primarily to relationship marketing literature. Indeed, by engaging in a long-term relationship, the parties (customers and suppliers) expect mutual benefits (Dimitridis, 2011). Service providers expect loyalty from their customers and more resistance to competitors (Kinard and Capella,

2006). Apart from core services, customers expect to receive relationship benefits that will motivate them to be loyal (Gwinner *et al.*, 1998).

The study of Gwinner *et al.* (1998) was one of the first, to empirically study the benefits of the customer-service provider relationship. The authors tried to conceptualize the benefits of developing long-term relationships with service providers. Indeed, in a first phase, they identified four relationship benefits through an exploratory qualitative study (social, psychological, economic and customization benefits). Later, in a confirmatory quantitative phase, they validated the following three dimensions of relationship benefits:

- *Social benefits*: mainly in the form of friendship and warm bonds, which are formed between customers and sales staff members. These benefits make it possible to take into account the contacts between the customers and the supplier, not only for service delivery, but also for a customized contact.
- *Trust benefits*: psychological in nature, related to the fact that the customer can be reassured by being informed on what to expect. These benefits are generated through interactions and reinforce the belief in the integrity of the service provider.
- *Special treatment benefits*: essentially related to the customization of the offer made by the supplier for its regular consumers: price reductions, additional services, celerity of execution, *etc.* The special treatment also makes it possible to satisfy a need for recognition.

Several studies referred to this conceptualization of relationship benefits to validate them in different service sectors such as travel agencies, hairdressers, doctors, fast food, banks, *etc.* (Henning-Thurau *et al.*, 2002; Kinard and Capella, 2006; Molina *et al.*, 2007; Dagger *et al.*, 2011).

Inspired by the work of Gwinner *et al.* (1998) who studied perceived benefits, Dimitridis (2011) attempted to explore the relationship benefits expected from an existing or a potential relationship with a service provider. The author conducted a qualitative study in the banking sector trying to enrich the conceptualization of Gwinner *et al.* (1998). This first study enabled the author to identify four expected relationship benefits: “trust”, “customization and special treatment”, “social bonds” and “ease and simplicity”. In order to validate this conceptualization, a quantitative study involving 209 bank customers was conducted. The following dimensions have been confirmed: (1) special treatment (which includes the customization and special treatment dimension and the social bonds dimension identified in the qualitative study), (2) competence and benevolence (two sub-dimensions that refer to the trust dimension identified in the qualitative study), (3) convenience (which is time, simplicity and ease) and (4) responsiveness (the bank’s ability to quickly and

efficiently handle customer requests). This study allowed the identification of the benefits of convenience and responsiveness that result from customer knowledge of the supplier.

Empirical studies of different service categories have shown that, in the eyes of consumers, psychological benefits are the most important benefits, followed by social benefits. Economic or functional benefits come last (Gwinner et al., 1998; Henning-Thurau et al., 2002; Molina et al., 2007; Dimitridis, 2011; Dagger et al., 2011).

Relationship Sacrifices in B-to-C

Relationship sacrifices have rarely been dealt with in research, although it is generally accepted that there are costs or sacrifices incurred in building and maintaining a relationship with customers (Dimitridis, 2011). One of the few studies that tried to conceptualize and measure relationship sacrifices is that of Dimitridis (2011). Starting from research on switching costs, this author attempted to conceptualize the relationship sacrifices of the customers in the banking sector. Results distinguished two main categories of expected relationship sacrifices: relationship investment sacrifices (which include the time and effort required to learn the service provider's procedures) and the sacrifices or inconveniences that the consumer has to accept in order to keep the relationship with the provider (which include psychological costs and extra costs related to customized services and special treatment).

However, Dimitridis (2011) examined expected relationship benefits and expected relationship sacrifices as variables of customer segmentation in the banking sector. The author did not attempt to integrate these two components for a better understanding of perceived relationship value. In sum, research on relationship sacrifices is still at an embryonic stage.

An Integrative Framework for Perceived Relationship Value

Following this review of the literature on perceived relationship value, it seems that there are as many typologies as there are studies. There is therefore no unanimous and explicit theory about this concept, a fact that encourages us to continue to explore it.

It is interesting, therefore, to use the common and/or salient dimensions of these typologies to integrate them into a simple and sufficiently comprehensive model. Table 8 summarizes the main approaches of the literature, which are needed to comprehensively cover the notion of perceived relationship value.

This synthesis enhances the conceptualization of perceived relationship value by combining the contributions of the research works conducted in B-to-B (mainly the

diversity of relational benefits and costs) and in B-to-C (mainly the consideration of non-rational dimensions: social, trust, and special treatment).

Table 8. The synthesis of the literature on the benefits / sacrifices related to the customer-supplier relationship (B-to-B and B-to-C)

Authors	Conceptualization
Gwinner et al. (1998)	Perceived relational benefits: - Social benefits - Trust benefits - Special treatment benefits
Lapierre (2000)	Three dimensions of benefits: - related to the product (alternative solutions, product quality and product customization) - service-related (responsiveness, flexibility, reliability and technical competence) - related to the relationship (the image of the supplier, the trust, the solidarity of the supplier with his customers) Two dimensions of sacrifice: - related to the product and service (the price) - related to relationship (time / effort / energy and conflict)
Uлага and Eggert (2002 ; 2005 ; 2006)	Four dimensions of benefits: - central benefits (product-related, service-related) - benefits related to the transfer of know-how - time-to-market - social benefits Three dimensions of sacrifice: - direct costs - acquisition costs - operating costs
Dimitridis (2011)	Expected relationship benefits: - Special treatment - Competence and benevolence - Convenience - Responsiveness Expected relationship costs: - Sacrifices (customization costs, monetary costs, commitment time, loss of alternatives, stress of choice, communication) - Relationship investment (Time and effort to learn)

CONCLUSION

Companies are constantly looking for effective ways to improve customer loyalty (Ting pong and Tang Pui, 2001). In response to this need, the perceived relationship value allows managers, among other things, to control the loyalty process (Cater

and Cater, 2009) particularly with Digital Marketing tools that allows companies to interact intensely with consumers (Gunawan Bata *et al.*, 2021). This literature review showed that several studies have focused on the concept of perceived relationship value, especially in the B-to-B field. However, this concept would benefit from an accurate definition in a more integrative way. To this end, an eclectic review of the literature has been made, drawing on industrial marketing, service marketing and B-to-B literature, even if our focus is precisely B-to-C.

This literature review gives us enough material that can serve as a starting point for a reflection on the benefits and the sacrifices in a customer-business relationship. Then, what is the structure of perceived relationship value in B-to-C? What are the most salient benefits/sacrifices that determine this perceived relationship value ? In order to identify and circumscribe this notion of perceived relationship value with its various dimensions, a rigorous conceptualization with a multi-phase process in line with the recommendations of Mackenzie, Podsakoff and Podsakoff (2011) should be adopted.

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KEY TERMS AND DEFINITIONS

Consumer Value: A relative preference (comparative, personal, situational) during the experience of a person with an object (Holbrook, 1994, 1999).

Customer Value: Is a comparison between the ratio of what is given and what is received (give-get ratio) (Hansen *et al.*, 2013).

Perceived Relationship Value: The relationship customer-supplier is considered as a source of value. The value comes from this relationship as well as from the product or the service (Ravald and Grönroos, 1996).

Relational Approach: Is centered on the customer and aims to keep current customers before gaining new ones (Grönroos, 1994).

Relationship Benefits: Benefits of developing long-term relationships with service providers perceived by customers (Gwinner *et al.*, 1998).

Relationship Sacrifices: Costs or sacrifices incurred by the consumer to build and maintain a relationship (Dimitridis, 2011).


Transactional Approach: Is centered on the transaction which represents the episode during which an exchange of values takes place between two economic entities. In this approach the product represents the most important object and the price is considered as the most determining criterion of purchase (Dwyer *et al.*, 1987; Crié, 2002).

Value Proposition: Is an explicit promise made by a company to its customers that will deliver a particular amount of value creating benefits (Hassen, 2012).


Chapter 5

Using Social Media to Manage Customer Expectations and Quality Perceptions in the Hospitality Industry

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ABSTRACT

The hospitality sector is a big contributor to the Indian economy. According to a recent report by KPMG, the Indian hospitality industry is projected to grow at 16.1% CAGR to reach Rs 2,796.9 thousand crore in 2022. The hospitality sector provides jobs to a large number of people and defines a service sector which is growing in popularity with an increase in incomes across the middle class and an increasing desire to indulge in entertainment and related activities. This chapter details the factors influencing consumer expectations from the service industry and helps in understanding the usage of social media to manage customer expectations and perceptions of quality. It also aims at identifying ways to use social media to plug service quality gaps and increase consumer loyalty. The chapter also explores the appropriate advertising appeals that should be used by the hospitality industry on social media.

DOI: 10.4018/978-1-7998-9553-4.ch005

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INTRODUCTION

Consumer behavior in the hospitality industry is typically a function of the service encounter ie. the actual consumer experience when the service was delivered to him. When a consumer decides to visit a restaurant or hotel, for a formal/informal outing, he/she is seeking specific solutions to specific needs triggered by his/her subconscious (personal aspirations), physical conditions(hunger) or external sources (marketing messages from a restaurant). The major challenge presented in front of the individual is the evaluation of the options available from the evoked set of options, which are available to him based on his past experiences. There is a resistance towards trying out new options and experiences as there is a certain amount of risk/uncertainty attached with the experience. The intangibility of the hospitality service, makes the experience different from the experience of consumption of a tangible product (Hellen, & Gummerus, 2013). When a consumer buys a product, he can assess the size, shape and other physical attributes of the same. However, when he considers procuring a service, he/she depends on recommendations of peers, perceived value of the service, past experiences and testimonials from others. (Malik, Akhtar, Raziq, & Ahmad, 2020).

This is where social media has a huge role to play. Social media marketing strategies for the hospitality sector should be designed keeping in mind the need to understand customers' service expectations and risk reduction.

BACKGROUND

The consumer evaluation of a service in the hospitality sector, is based on *Search* attributes, *Experience* attributes and *Credence* attributes (Lassoued, & Hobbs, 2015). Organizations in the hospitality sector can successfully create content which revolves around these 3 attributes (Figure 1) and answer the associated queries in the consumer mind.

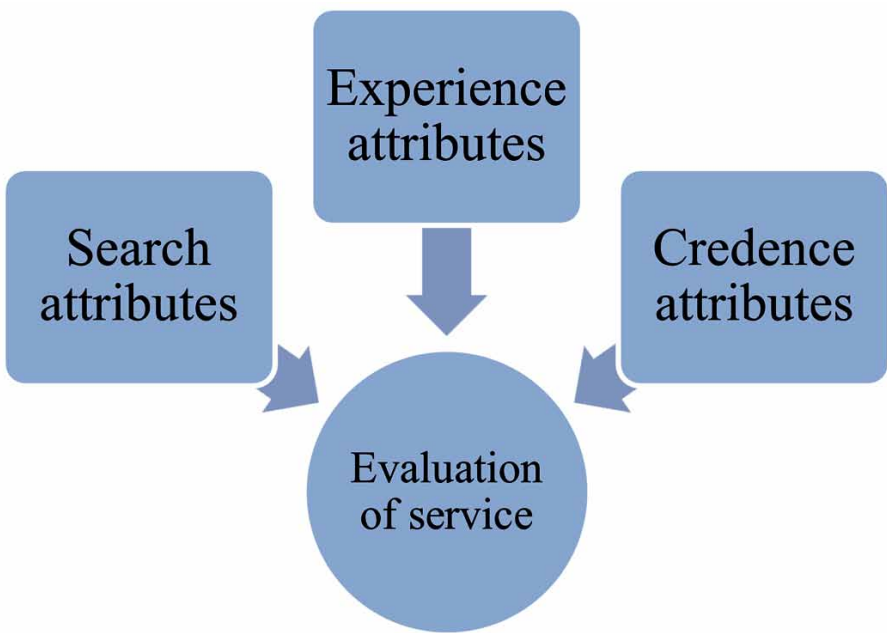
Search Attributes include aspects like type of food, type of restaurant (for a professional meeting or a family outing), location and price (Degeratu et al., 2000). By hosting appropriate social media campaigns, companies can cater to diverse types of customers. For instance, a campaign comprising a family celebrating a birthday will entice the family audiences, whereas a campaign highlighting a professional experience will lure the corporate customers

Experience attributes refer to issues pertaining to how well a consumer will enjoy the food, the service and the ambience, before physically going through the experience (Srinivasan, & Till 2002). By using social media effectively, companies

can showcase glimpses of these experiences on social networks and give potential customers an overview of what they can expect

Credence attributes include those features which a consumer has difficulty in evaluating, even after the consumption of the service e.g., Hygiene conditions of the kitchen and the quality of the cooking ingredients. By sharing pictures of their food preparation processes and standards organizations can cater to these credence attributes.

Figure 1. Evaluation of services



Reducing Consumer Perceptions of Risk in the Hospitality Sector Using Social Media

A consumer faces a series of risks while making a service purchase(Gjerald, &Lyngstad 2015). These include Functional, Financial, Temporal, Physical, Psychological and Social risks. Table 1 discusses the risks and showcases how relevant social media content can assuage consumer worries and reduce the perceived risk levels significantly, in the hospitality industry.

Table 1. Reducing consumer perceptions of risk using social media

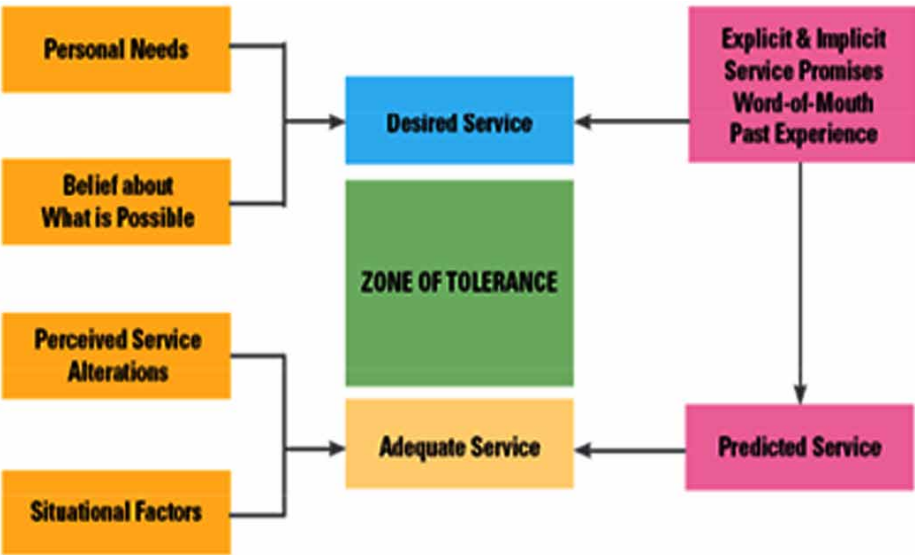
Risk	Implication	Social Media Strategy to Combat the Risk
Functional	These are consumer worries corresponding to unsatisfactory results of a purchase. For example, a consumer has decided to go and stay in a resort with his family for a week and may be worried that the experience may/may not live up to their expectations.	A social media campaign pertaining to what a consumer can expect from his stay in the resort can assuage consumer worries and prepare him about what he can expect. This way social media can be used to shape and influence consumer expectations from a service experience
Financial	These risks are associated with worries pertaining to financial losses or additional costs.	Relevant social media content showing the consumers that they are entering into a good deal will reduce this worry.
Temporal	These are risks associated with wastage of time or delays. For instance, a consumer may arrive at a hotel for a meal, but may have to wait for a table or the delays after ordering may upset his future schedule. These worries emerge when a consumer is using a particular hospitality brand for the first time.	Social media campaigns showcasing a fast service, pre-booking opportunities and the hospitality brand's commitment towards valuing the consumers' time, will assuage this risk.
Physical	These are worries when families travel together and are apprehensive about damage to self or their possessions.	Social media campaigns showing the ' <i>Atithi devo bhava</i> ' philosophy of customer centricity will assuage these fears.
Psychological	Unwanted fears and negative emotions sometimes tend to cloud consumer thought processes. This happens primarily because the world of hospitality caters to something that is very personal to an individual. This is about self and family, which are sacrosanct entities in a human being's personal journey.	By displaying adequate credentials and testimonials in the virtual spaces and making sure that the information reaches the consumer, hospitality companies can add significant weight to their credibility, and moderate any negative thoughts in the consumer mind.
Social	Individuals are concerned about what their peers will think about their choices.	By providing free trials and using social media to provide evidence about positive experiences, organizations can enhance the value perception in the consumer mind, thereby encouraging visits and building confidence in their choices.

Managing Service Expectations From the Hospitality Industry Using Social Media

Customers evaluate service quality by comparing what they expect against what they perceive. Situational and personal factors are also considered in this context. The expectations with regard to service levels differ from one individual to the other (Langvinienė& Daunoravičiūtė2015). The following section discusses the specific

factors influencing customer expectations from the hospitality industry (Figure 2) and ways to handle the same, using social media.

Figure 2. Factors influencing customer expectations from the hospitality industry



The personal needs of a consumer, coupled with a belief with regard to all that is possible for satisfaction of these needs, sets a desired service level in the consumer mind. This expectation is further shaped by explicit and implicit service promises made by the service organization (in this case the restaurant/hotel). These promises could have been made by the service provider through advertising or other promotional messages. Also influencing the consumer expectations are his past experiences with the same hotel property and the word of mouth pertaining to the same, in the peer groups of the consumer (Chen, Riantama, & Chen 2020).

When the experience is actually delivered to the consumer, certain situational factors may result in some service alterations and the consumer may end up receiving not the *desired* service level, but an *adequate* service level. The gap between the *desired* and the *adequate* service level is termed as the zone of tolerance of the consumer. Social media can be used by companies to impact this zone of tolerance and moderate consumer expectations to give him satisfaction from the *adequate* service level. This can be done by carrying on social media campaigns associated with the functional and emotional benefits of the hospitality experiences. Some campaigns showcasing functional benefits can include details about the superior

quality cuisines, the gourmet food, the luxurious ambience, the fitness and wellness opportunities, the pollution free atmosphere and a holistic experience. Campaigns showcasing emotional benefits can include pictures of special birthday surprises and celebrations, families enjoying quality time together, celebrity endorsements etc. Both the functional and emotional benefits enhance the perceived value of the experiences and favourably impacts the zone of tolerance.

Specific posts pertaining to the service encounter stage, can focus on

1. The Service Products.

The service ‘product’ refers to the core service, the supplementary services and the delivery process. The core service in a hotel for a guest arriving for a one-night stay would include the room, the room service, the television, the internet service, the meal, the car parking, the porter, the check in and check out experience, the swimming pool, the gymnasium etc. The core service is supported by the supplementary services, which have two dimensions-facilitating elements and enhancing elements. In the above case, the facilitating elements would include information (room location, confirmation of booking etc.), billing (generation of invoices and receipts), payment (digitisation, credit cards etc. for speedy clearance and consumer convenience), and order taking (memberships, subscription, reservations, check-in etc.). The enhancing elements would include consultation (any customised advice like visiting specific tourist spots), hospitality (food, beverages, lounges, transport, security etc.), safekeeping (child care, pet care, baggage handling, valet parking, storage space, safe deposit boxes for valuables etc.) and exceptions (children’s needs, dietary requirements, care for the elderly, medical or disability support, religious issues, etc.). All these components of the service experience are supported by the delivery of service by a congenial staff, as per the expected delivery schedule and sequence of events.

Based on the above discussion, the hospitality industry can generate content about room sizes, beds, mattresses, carpets, lighting, upholstery, room service, restaurants, food, types of cuisine, swimming pools, gymnasiums, spas, horticulture etc. Also, by providing a ‘book now’ option on the social media pages, companies can cash in on any impulse purchases a consumer may want to make after being motivated by the social media campaigns. Additionally, content pertaining to the facilitating and enhancing services will augment consumer perceptions about a hospitality brand.

2. The Quality.

Posts highlighting superior quality levels can include world class amenities, *Michelin* stars, global certification and accreditations, national awards, memberships of international cliques, best hotel and resorts in the world listings, annual gold lists,

world renowned chefs, participation in national and global events and conferences, and yoga/reiki masters etc.

3. The Pricing.

Pricing is an important element of the marketing mix, by showing exquisite decor and ornate artwork in their properties, rich upholstery, luxurious seating options, a quintessentially beautiful and palatial ambience, finest, gourmet food and drink etc., hotels can position themselves in the luxury market and charge the associated price for their services. Posts pertaining to grandeur, fairy-tale weddings, upholding tradition in an elegant manner further contribute to a premium positioning which when backed by adequate personalisation, can help the hotel command a superior pricing.

4. The Positioning.

By hosting posts showcasing their best industry practices, their focus on personalisation and customisation and emphasis on quality, hospitality companies can use social media for crafting a superior brand positioning. Positioning is all about creating a differentiation and competitive advantage. These hotels, resorts and restaurants can show the unique experiences they offer through social media campaigns, to create the relevant perception in the consumer minds. Some other hospitality industry members may want to craft a positioning based on convenience and cost effectiveness. Social media can subsequently be used to create content to reflect this positioning.

5. The Promotional Campaigns.

Social media posts can be used to create content pertaining to early bookings, happy hours, special discounts, rebates and special schemes for loyal customers. Suitable content pertaining to celebration of specific cuisine can help hotels entice the specific clientele for the specific events. Posts about celebrities having visited the hotel property can be used for garnering endorsements on social media. Additionally, testimonials from consumers can help generate trust and credibility for the organisation in the hospitality sector.

Servqual Dimensions and Social Media

Zeithaml, Parasuraman and Berry defined 5 dimensions of Service Quality which when handled appropriately are the keys to consumer loyalty for any service organization.

The following section discusses these Servqual dimensions and provides illustrations on how certain Indian hospitality companies have effectively used social media and emphasized these dimensions successfully.

The Servqual Dimensions include-

1. **Tangibles**-Appearance of the physical facilities and infrastructure of the hotel property, the equipment being used, the manpower resources employed by the hotel etc.
2. **Reliability**- The level of the perceived credibility and dependability of the hospitality organization. Associating with an organization in the hospitality industry is all about trust. Organizations which are able to build trustworthiness have loyal consumers who stay with the companies for long periods of time.
3. **Responsiveness**-Willingness to help customers and provide prompt service. Interestingly, none of the hotels in India were using social media to tell their customers that the hotels were eager to help and take care of them. There were posts reiterating the hotels' commitment towards providing memorable experiences and comfortable stays. However, this aspect, where hotels could highlight that they would be very sensitive to consumer requirements was missing. Consumers need to be explicitly told that they are important and social media provides an excellent platform for the hospitality industry to do so. By hosting content pertaining to looking after young children, day care facilities, safekeeping valuables etc., hospitality industry members can formulate a relationship bond between the hotel and the consumer.
4. **Assurance**-Knowledge and courtesy of employees and their ability to convey trust and confidence. Consumers go to hospitality retreats for entertainment, rest, relaxation, rejuvenation, healing, wellness or even spirituality. These are journeys for the renewal of the body and the mind and need to be undertaken in stress free, peaceful environments. For situation like these, consumers need to know and believe that the hospitality organization they are placing their faith in, has their best interests at heart and has the capacity and ability to help him. Organizations can make use of social media to build faith for the capabilities and civility of its manpower resources, to enable consumers to place themselves in their hands without doubt or trepidation.
5. **Empathy**-Caring, individualized attention the firm provides its customer. Personalized attention from the service delivery personnel in the hospitality sector can make a humongous difference to the customer experience. Relevant social media content showing the hotel's commitment to personalization and customization can improve consumer perception during the consumer decision making journey.

Some Illustrations

The Leela Palace chain of hotels showcases picturesque views of the vast expanse of the blue sky indulging in a harmonious union with the sea from its sea facing courtyard in the Chennai property, enabling guests to enjoy some wonderfully soulful and mesmerizing moments. Similar posts about the Leela, Kovalam delineate how guests can enjoy the panoramic views of the Arabian sea. Posts discussing how the vast hotel lobbies reflects India's cultural heritage and sprawling terraces enable guests to enjoy poignant experiences. Similarly posts like the ones about the *Tree of Life* mural, depicting the rich Rajasthani cultural heritage at the Leela Palace, Udaipur and the Chettinad Palace architecture at the Leela Palace, Mumbai, the library bar at the Leela Palace, Bangalore, the plunge pools and multicuisine club lounges at the Leela Place, Goa are examples of how the hotel chain is using social media to use the Servqual dimension of tangibles to ensure customer satisfaction and cultivate consumer loyalty.

Club Mahindra organized a #MyFamilyVacation contest on social media, inviting participants to share quick stories or memories or extraordinary family vacation photographs from their holidays at one of the Mahindra properties. Participants were invited to tag their friends and family and get them to join the fun contest. Through the activity, Mahindra tried to create an ambience of participation, peer to peer communication and reciprocity. Activities like this help organizations in getting consumers to generate content and subsequently a climate of trust and reliability through the consumer testimonials. Consumers attach a lot of importance to the content created by their peers, as they do not consider this as advertising content hosted by the organization.

Ananda-A luxury spa resort. Several hotels try to create an intellectual perception for their leadership by communicating the best practices being followed, the international conferences and events being organized, the healthcare workshops being organized by their employees etc. Hospitality retreats like Ananda, a luxury destination spa resort in the Himalayas, surrounded by graceful Sal forests overlooking the spiritual town of Rishikesh, by the Ganges River are positioning themselves as health, wellness and spiritual retreats. Their social media campaigns details the courteous nature of the employees and the well-trained healing masters for Ayurveda, hypnotherapy, regression, reiki, yoga etc. The virtual presence of the organization is replete with details of healthcare and holistic wellness workshops being organized at the venue for the guests and employees, anger and stress management forums, and regular visits by international experts for emotional freedom therapy and chronic lifestyle issues. Social media posts also carry details of their rebalancing programs and good health cuisines developed by internationally trained chefs.

The Oberoi group owns over 35 luxury hotels and 2 cruise ships in six countries under the umbrella of brand Oberoi Hotels and Resorts. The twitter page of the hotel chain showcases its philosophy of providing the right blend of service, luxury and efficiency. Posts by the organizations pertaining to soothing the midweek blues of consumers, providing opportunities for gifting specialized experiences, opportunities for private gardens and pools, special fine dining experiences, private villas, special customized cuisine for sentimentalists and loyal patrons, impeccable service and unforgettable experiences reiterate the organizations empathetic orientation towards its customers.

Positioning

The hospitality industry can use social media to answer the following questions for themselves and influence consumer thought processes based on their own positioning objectives.

1. What does our firm stand for, in the minds of the consumers?
2. What customer segments do we serve now and which ones would we want to target?
3. What is the value proposition for our current service products and market segments?
4. What is our product differentiation?
5. What is the perception of our product offerings in the minds of the target consumer segment?
6. What changes should be made to our social media policy to strengthen our positioning in the consumer minds?

The Service Quality Gaps and Social Media

As per the gaps model (Frost&Kumar 2000) there are gaps between consumer expectation from a service and a firm's actual delivery of a service. These are-

1. The Knowledge Gap-The gap between management perceptions of what customers want from an organisation and what the customers actually want. To close this gap, companies need to educate management about customer expectations.
2. The Policy Gap-This is the gap between the actual consumer expectations and the policies developed by the organisation to ensure certain delivery standards and specifications. To close this gap, companies need to establish right service processes and service standards.

Using Social Media to Manage Customer Expectations

3. (To close this gap, companies need to ensure that organisational performance meets predefined standards and that customers comprehend the quality of service delivered.
4. The Communication Gap between the service quality and delivery and the promises made to the customers. To close this gap, companies need to ensure that their communication to customers is realistic and correctly understood by customers.
5. The Perception Gap between the actual service offered/delivered and the customer understanding about it. To plug this gap, companies need to tangibilise and communicate the service quality delivered.

Organizations in the hospitality sector can make use of social media to plug the delivery gap partially and to close the Communication and Perception gaps.

The following table discusses in detail how companies can use social media for the same.

Table 2. Using social media to bridge the delivery, communication and perception gaps in the hospitality sector.

Service Quality Gap	Plugging the Gap Using Social Media
Delivery Gap	<p>Sometimes consumers have been provided a service of the optimum quality, however a lack of knowledge on the consumer's front, prevents him from comprehending that he has been given whatever was promised to him. For instance, a hotel may equip the dining area with a state-of-the-art coffee vending machine. However, if a consumer does not know how to use the machine and is not able to service himself, it is important to apprise him that this is not a service delivery failure. Creating a video on how the machine can be operated and posting it on social media will enable the hospitality organization to educate consumers and sensitise them, about the superior amenities available at the hotel. Situations like these motivate the consumers to learn how to use the amenities, or solicit the support of the service delivery personnel at the point of service consumption. This way, companies can ensure that consumer value perception pertaining to the service offering improves substantially.</p> <p>Needless to say that, prior to the above, companies need to find ways to ensure that their consumers are following them/interacting with them in the social media spaces, so that the relevant content enters their social content feed.</p>

Continued on following page

Table 2. Continued

Service Quality Gap	Plugging the Gap Using Social Media
Communication Gap	Sharing relevant advertisements and communication and motivational campaigns on social media so that all organisational staff has access to the information will ensure integration of the marketing messages sent out to the consumers and create a uniformity of marketing communication across the organisation. This way, organisations can ensure that there are no gaps between what is being promised to the consumer and what is being delivered. Sharing consumer testimonials highlighting the service characteristics which are most significant to the customers, will further help to reduce the communication gap. Inviting recent consumers to participate in an online dialogue and sharing experiences and feedback are other ways of plugging the communication gap. In case a company is faced with an unforeseen problem which results in certain shortcomings in service performance, the company can use social media to communicate that the reasons were beyond the control of the specific organisation. They may be surprised to see that they may be able to generate sympathy from certain loyal customers. All customers appreciate the fact that services cannot be inventoried and are created at the point of service delivery; hence the opportunities for service failure can arise. This can subsequently result in the creation of a peer to peer interaction where consumers who were going to be critical may be appeased. Additional service recovery measures can be brought into place to ensure that any service failure is taken care of.
Perception Gap	Research has proven that tangibilising services through visual tangible cues is especially relevant in the case of experiential services because they influence consumer attitudes. Hotels can host a lot of factual information (national hospitality awards), as also content pertaining to emotional appeals (families eating together in a joyous mood, in a luxurious ambience), quality (a brand ambassador eating at the hotel or the hotel hosting an international cricket team) and convenience appeals (location in the heart of the city or near the airport). The visual imagery triggers the relevant elements in consumer psychology and activates a clear mental image of the constructive outcomes resulting from the services, thereby, making it easier for customers to fully appreciate the benefits.

Managing Customer Relationships and Building Loyalty Using Social Media

Customer Loyalty is important for the long term profitability of an organization (Amir, Yousuf, & Asma. 2014). Research has shown that it costs 5 times more to acquire a new consumer than to retain an already existing one. Loyal customers imply high customer lifetime values because of their repeat purchases, reduced operating costs and serve as customer evangelists who recommend a hospitality property to their friends and peers. They are used to the services of the organization, do not complain and are willing to pay extra/make adjustments during periods of higher demand. Customers stay loyal when organizations create the right value proposition for them by matching the service offering with a customer's needs. Companies in the hospitality sector can use social media to impact these value perceptions by hosting content showing how the hotel's services are exactly in line with the consumers

requirements-personal (family/vacation/celebration etc.) or professional (conference, annual meetings etc.)

For example, Club Mahindra Holidays is an Indian hospitality organization which is a part of the Mahindra Group and offers holiday opportunities to customers on a timeshare basis. Mahindra Holiday and Resorts India Ltd. is a part of the Leisure and Hospitality wing of the Mahindra Group.

The Mahindra Group believes in challenging conventional thinking and uses its resources in an innovative manner. The value system endorsed by the group revolves around professionalism, good corporate citizenship, customer first, quality focus and dignity of the individual. In addition to this, the group claims that it believes in growing and rising with all its stakeholders. In line with this philosophy, the Mahindra Group offers opportunities for family holidays through vacation ownership to its members for memorable experiences for a time frame of 25 years. The salient features of the membership program revolve around creating a loyal customer base, by showcasing significant benefits to customers. These include the customers' ability to experience a holiday for a week for 25 years, thereby ensuring that he is able to satisfy his recreation needs even when he is hugely loaded with his professional commitments. By providing customers with access to a wide network of over 50 resort destinations across the globe, with stupendous arrangements for various types of accommodation and amenities, at suitable prices, team Mahindra promises customers with magical experiences.

Organizations with a long-term vision focus on level of customer satisfaction and ensure that this customer gratification and fulfilment makes him patronize the brand for several years to come.

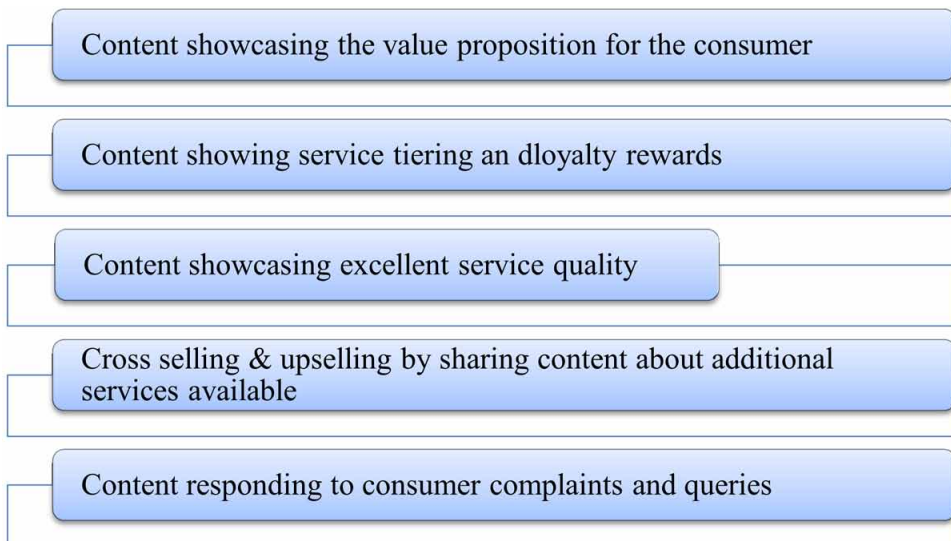
Through this loyalty program, Mahindra has ensured a constant revenue stream from a set of loyal customers who will not switch to a competing brand as long as they feel that they are getting what they deserved. The challenge here, lies in enhancing customer perceived value about the brand and Team Mahindra has successfully been able to use its social media presence to share brand related content to enhance consumer perceptions about the brand. Needless to say, the consumer generated content in response to this organization generated content stream has created a huge repository of consumer testimonials, which when backed by peer-to-peer conversations, is ensuring positive word of mouth for the brand.

Additionally, hotels can go in for a Service tiering and loyalty rewards (financial/non-financial) program. In these programs, specialized services packages are offered to customers across different segments. As the services offered across the packages improve, so does the price. That way, a hotel has an offering for people across all price points. Hotels can charge more for larger rooms, more luxurious settings and gourmet meals. At the same time, they can have separate packages for the middle-class consumers with average quality rooms, ambience and meals. Specific loyalty

rewards programs can help hotels give long term memberships and associated benefits to loyal customers. Quality is also an important determinant of consumer loyalty. Consumer loyalty increases as consumers feel that they are getting services of optimum quality. Hotels can also deepen their relationship with the consumers via cross selling and bundling. Upselling will involve getting consumers to consider spending more on their current choices, for example, by upgrading their room for a higher priced, more luxurious option. Cross-selling will involve getting customers to spend on ancillary services like buying a spa treatment session while on a holiday vacation. To increase consumer loyalty, hotels also need to address the causes for consumer churn. If a consumer is facing a problem, and complains, effective complaint handling should be brought into place. Adequate service recovery methods, in case of service failure and proactive retention measures will enable hotels to retain their customers.

The following figure details how the hospitality industry can use social media to drive consumer loyalty.

Figure 3. Using social media to enhance consumer loyalty in the hospitality sector

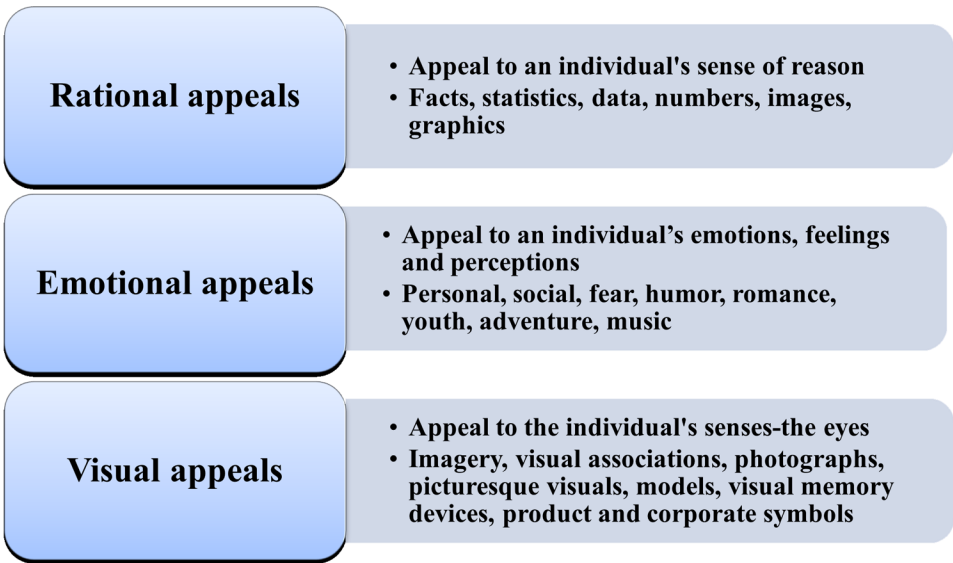


Types of Advertising Appeals Used by the Hospitality Sector on Social Media

When social media content is created, each post has a specific message or primary claim or objective. This is the advertising appeal (Zikri, & Dwita, 2021) which creates a persuasive pressure that motivates a consumer to buy a product or service. There are three types of advertising appeals (Figure 4) that can be used on social media

1. Rational Appeals
2. Emotional Appeals
3. Visual Appeals

Figure 4. Types of advertising appeals and social media content



Rational Appeals

These appeal to an individual's sense of reason. They are balanced and coherent and use information to build logical arguments. They are preferred by consumers who do not like uncertainty and like to avoid risk, and prefer explicit, logical and direct content. They communicate the functional aspects of the services and the statement of facts goes well with the consumer cognitive space, which processes the information and the appropriate behavioral responses emerge.

Emotional Appeals

Emotional (Grigaliunaite, & Pileliene, 2016). advertising appeals help in targeting neither logic or reason, but the consumer emotions. Emotional appeals can provide a strong emotional association to accompany the holistic processing of visual stimuli and can be used to encourage compliant behavior from the consumers. Research has shown that advertising effectiveness is a function of emotional appeals, message informativeness, and creativity and contributes to positive consumer online behavior. Specific emotional appeals that can be used by the hospitality sector include-

- **Personal Appeal:** These appeals invoke strong reactions as the images touch the consumers' heart strings in some way and incite them to take action. This action usually is a positive response towards the hospitality brand. A social media post with the picture of a father celebrating a child's birthday with family and friends, in a hotel, can trigger feelings of guilt in a parent and provoke him to take appropriate action.
- **Social Appeal:** These appeals grant social acceptance to the organization hosting them. They create an image of a socially responsible organization interested in finding ways to contribute positively to the improvement of society at large, for instance, by supporting the underprivileged. Social media content showing a hotel offering free food to children from a nearby orphanage, can generate social recognition and positivity for the organization. Additionally, content showcasing groups of friends sharing and enjoying food together creates value for the joy of sharing and can also be categorized as a social appeal, and triggers needs which persuade individuals to do the same.
- **Fear Appeal:** These appeals aim to frighten individuals by discussing threatening events that may happen in their future. These perceived threats and perceived efficacy from a situation/service or product can cause specific behavioral changes because of fear. Social media content using the 'fear' appeal can be directed towards motivating individuals to spend quality time on vacations with family, and make memories before they lose the older family members.
- **Happiness and Fun Appeal:** Content that stimulates positive vibes and pleasure yields higher results. A social media post, using the happiness appeal and talking about an upcoming new year party with lots of amusement, food and drinks can entice customers merely because of its cheerfulness.
- **Health and Wellbeing Appeal:** As consumers become more and more health conscious and start taking pro-active measures to strengthen their health and well-being, this is becoming a significant way to appeal to an individual's diet and lifestyle choices. Content pertaining to treating lifestyle diseases through

a naturopathy or yoga session in a resort or holistic therapies for the mind, body and soul falls in this category.

- **Romance Appeal:** This appeal signifies a closeness between two individuals in a relationship and is directed towards motivating customers to adopt a product or service to enhance that closeness. Content pertaining to special celebrations on Valentine's Day, hosted by a hotel on its social media pages falls under this category.
- **Music Appeal:** Content revolving around music makes brands get noticed faster and these musical appeals bring up positive memories associated with any catchy tunes or songs. Examples include social media content pertaining to a special musical night by a music maestro playing at the hotel.

Visual Appeals

Visual appeals cater to the consumer's senses-his eyes. The psychology of colors has an important role to play in the creation of effective visual content on social media. For instance, red may be used to portray excitement, yellow for optimism and happiness and green for life and health. Also, visual content appears more meaningful when the textual message in the content is in sync with the picture in the message. The benefits of using visual appeals on social media are-

- They help in establishing a brand personality for the organisation
- They help in associating a service with certain symbols and lifestyles
- They create a brand identity in the minds of the target audience.
- They enhance the perceived quality of the service offering
- They increase likelihood of service patronage
- They help in strengthening brand recall through repetition of the message.

Visual appeals create a vivid mental picture about the service's benefits in the consumer's mind. For example, if a social media post shows a cruise line where passengers are enjoying gourmet meals, fine dining and dancing, prospective customers could visualize themselves enjoying themselves on the ship.

For example, Club Mahindra has successfully created a superior social media experience for its consumers by creating a significant volume of social media content through photographs and videos. Primarily, the content is directed towards creating visual appeal due to its vivid and intense nature. The postage frequency further adds to the level of consumer engagement. The content ranges from pictures of Kanatal-a heavenly destination situated at an altitude of 85000 feet, to snow covered peaks in Manali. Picturesque content has been successfully able to capture the tranquility of winters at Naldehra or the soft snowy peaks with clouds caressing the sky, at other

locations. One particular post showcasing the pictures of greenery and serenity at the Binsar valley Mahindra resort were so scenic and charming that they garnered over 18000 consumer likes, a large number of shares and several comments, clearly demonstrating that delightful illustrations enable consumers to visualize what awaits them at the destination and appreciate the same. This creates positive word of mouth and inadvertently helps in promotion of the online content.

Consumer Engagement, Participation and Reciprocity

Once an organization from the hospitality sector has understood the nuances of creating a social media presence, it needs to work on building audience engagement and participation. A social media presence without consumer interaction and engagement is meaningless. It is akin to a large volume of online content which no one is aware of.

Listed below are 5 strategies by which conscientious hotels can build a social media audience through engagement, participation and driving consumer conversations.

1. Once a hotel has established a social media presence, the same needs to be communicated to all the hotel customers. This can be done by ensuring that they receive a notification on social media or an email. Customers need to be invited to like or follow the social media content.
2. The hotel needs to build community around its social media presence by appreciating or sharing or liking the content being created by these individuals.
3. Additionally, hotels need to create content to induce consumers to respond. This can be done through asking for feedback or hosting a contest. Once the hotel has attracted the attention of the customers, all other aspects discussed in the chapter need to be taken into account. By hosting content that is relevant to the customers, e.g. inviting loyal hotel customers to get a picture clicked with a celebrity staying at the hotel, the hotels will be able to drive engagement and build participation.

Case Study 2.1: Holiday Inn-Low Consumer Engagement Despite a Good Social Media Content Strategy

Holiday Inn is a British owned American hotel brand. It is a subsidiary of the InterContinental Hotels group. The chain owns more than 1100 hotels across the globe, with more than 10 properties in India across Delhi NCR, Maharashtra and Karnataka. All the Holiday Inn properties boast of a robust social media presence, with distinctive positioning and differentiation strategies. For instance, the locational advantage of the Holiday Inn New Delhi International Airport property, of being

next to the airport, gives it a point of differentiation, which is reflected in its social media strategy. As compared, the Holiday Inn, Mayur Vihar caters to groups of friends and ladies and its central location makes it a suitable venue for wedding and birthday parties. Holiday Inn has crafted a nice social media strategy-however, the organization has not been able to leverage its social media presence adequately.

Reducing Consumer Perceptions of Risk Using Social Media

Consumers are faced with functional, financial, temporal, physical, social and psychological risks while making a product or service purchase. Holiday Inn's social media campaign showcases a wide variety of content, focused on delectable and appetizing food festivals and culinary options. There is adequate emphasis laid on mitigating the financial, psychological and social risks, by sharing information on special deals, happy hours, awards received by the hotel and large groups of people participating in events at the hotel, etc. While the hotel seems to be benefitting because of this, the losses due to inability to tackle consumer worries pertaining to the functional, temporal and psychological aspects are evident. There is very little content posted about options for staying at the hotel, catering to cocktail parties, private dinners, corporate events, theme breaks etc. Most of the content generated, is directed towards adding to the perceived brand value and promotional activities to drive sales. Adding a relationship dimension to the content, will enhance the prospects of Holiday Inn.

Managing Consumer Expectations Using Social Media

By hosting content pertaining to special rates for foreign travellers, happy hours, food festivals, tranquil environments, premium alcoholic beverages, flavors of diversity on republic day and a wholesome melange of delicious savouries and beverages on Christmas, and the special Punjabi cuisine in the Lohri festival, Holiday Inn's efforts are well directed towards creating content intended to shape consumer expectations. However, a low content postage frequency is one significant reason for the very low volume of consumer involvement and reciprocity. By hosting content pertaining to receiving the Best Employer Award, or videos of their chef cooking on Sahara Samay, moderation of consumer expectations has been achieved. What is lacking is the endorsement of the content by the consumers. Holiday Inn needs to conscientiously work on building consumer engagement and involvement with its social media presence.

Driving Loyalty

Holiday Inn is sharing content pertaining to the IHG rewards club, rewards nights etc., however the consumer response, though there, is not very significant. Holiday Inn is also hosting a series of events and the respective coverage on social media. The events like Kho Kho matches, the inter hotel badminton tournaments, Passion week, 2019 video challenge for the sales and marketing team of Holiday Inn, are directed at enhancing participation from hotel employees and customers. Holiday Inn is also trying to build credibility for itself in the online domain by sharing information pertaining to its corporate social responsibility efforts-be it the support being given to the people of Kerala after the floods

Advertising Appeals

The hotel chain uses a good mix of rational and emotional appeals in its social media content. It uses a wide variety of advertising appeals and the visuals are phenomenal. The content pertaining to mouthwatering Turkish delicacies, Italian festivals, Sunday brunches and republic day lunches and celebrating the detox week with juices to remove toxins, comprises a set of striking visuals. Additionally, the content pertaining to the goodness of TexMex delights, New Zealand lamb chops, lajawab kebabs, Peruvian food etc. takes viewers on a mouthwatering journey, visualizing scrumptious food. However, despite superior advertising appeals, very few consumers are liking, sharing or commenting on content generated by Holiday Inn. The organization's valentine day contest-*What does love mean to you*, garnered some consumer response, but this is clearly not enough.

Holiday Inn clearly has an excellent content strategy and an inconsequential consumer engagement strategy. A social media presence where consumer engagement, participation and reciprocity has not been significantly achieved, cannot be judged as a success story as the very basic objective of the social media endeavor has not been attained.

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Chapter 6

Environmental Sustainability, Value Co-Creation, and Innovation in Service Industries With the Lens of S-D Logic

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ABSTRACT

Businesses have recently shifted their attention to service innovation as a new economic justification for addressing environmental sustainability issues. Sustainable innovations may help businesses embrace solutions in new ways and can help firms grow and improve existing business models in ways that decrease social and environmental consequences while also adding new advantages and features. Businesses that adopt environmental sustainability in innovative processes can positively increase their opportunities to be innovative leaders in related fields. This acts as a link to win business competition around innovative approaches to environmental sustainability. In this context, the study aims to contribute to the role of environmental sustainability, value co-creation, and service innovation in service industries with an S-D logic perspective. From an S-D logic viewpoint, the study also investigates the extent to which service innovation and value co-creation may contribute to environmental sustainability.

DOI: 10.4018/978-1-7998-9553-4.ch006

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INTRODUCTION

Environmental sustainability which is becoming a major concern for businesses and policy makers (Murshed et al., 2021) includes monitoring the state of the physical world, controlling the direct and indirect effects of large-scale companies such as agriculture, transportation, service, and manufacturing, and influencing people's consumption and behavior choices (Woodruff and Mankoff, 2008). The capacity to retain valuable features in the physical environment is referred to as environmental sustainability (Sutton, 2004). Sustainable marketing, on the other hand, entails addressing present consumer and corporate requirements while also conserving or strengthening future generations' ability to meet their own (Kotler and Armstrong, 2010). As market behavior shifts from a Good-Dominant (G-D) logic to a Service-Dominant (S-D) logic (Vargo and Lusch, 2004), customers actively seek participation at every stage of the service system and create value by interacting with businesses. Today's environmentally conscious clients want service firms involved in environmental sustainability to not only meet their environmental responsibilities but also to promote environmental awareness as part of the value creation process. This demonstrates the need of allowing several stakeholders in the service system to engage in the value generation process. As a result, for long-term economic success, businesses must effectively manage their operations' environmental impact as well as stay up with the digital age.

The environmental consequences of business operations that consume natural resources today are just one of the issues that experts say will result in the collapse of social, ecological, and economic systems (Tsiliyannis, 2014). Businesses have recently shifted their attention to service innovation as a new economic justification for addressing environmental sustainability issues. Even if the innovation does not enhance the definition of service innovation, it aids in a better understanding of the notion in general and provides a framework for market creation and re-formation. This approach requires a unified innovation model that includes elements of innovation based on the general characteristics of the service. This viewpoint on innovation implies that technological advancements are interwoven in networks of market connections, necessitating a greater understanding of market interactions in order to comprehend innovation (Lusch and Nambisan, 2015). Innovation does not have to be technological in the S-D logic perspective; it may simply relate to a product being utilized in new ways, such as in a different context, time, or place. The beneficiary is positioned as the individual who defines the value of an invention that develops from the combination of resources, experience, and context in this concept (Mele et al., 2014). This sort of an innovation success also depends on the ability of businesses to "continually innovate, create, integrate and transform" the products they offer (Lusch et al., 2007). As a result, the S-D logic emphasizes that

effective innovation occurs in an “open and democratized process” in which all actors work together. Because few firms have “the sufficient expertise and human resources to generate the breakthroughs required to compete in the world” (Lusch et al., 2010). This situation causes businesses to adopt environmental sustainability practices and develop innovative services by co-creating value with their customers. From a service ecosystem viewpoint, businesses are rethinking the relationship between markets and technology by reframing service innovation as a result of the integration of value propositions that steer continuing interactions between different stakeholders or actors. Understanding consumers’ motives for actively value co-creation is critical for enabling and supporting emerging models of service innovation in environmental sustainability and achieving their sustainability potential in important sectors of human consumption, such as lodging and transportation systems (Lan et al., 2017). Sustainable innovations may help businesses embrace solutions in new ways, and all of these elements can help firms grow and improve existing business models in ways that decrease environmental and social consequences while also adding new advantages and features. It is found that organizations that incorporate environmental sustainability into their innovative processes have a better chance of becoming innovative leaders in related industries (Horng et al., 2016). This acts as a link to win business competition around innovative approaches to environmental sustainability. In other words, service innovation practice is concerned with the future environmental sustainability of service industries. In this context, the study aims to contribute to the role of environmental sustainability, value co-creation, and service innovation in service industries with an S-D logic perspective. As a result, from an S-D logic viewpoint, the study investigates the extent to which service innovation and value co-creation may contribute to environmental sustainability. For this purpose, answers to the following questions are sought:

RQ1: How is environmental sustainability evaluated within the framework of S-D Logic?

RQ2: How do businesses evaluate the concept of environmental sustainability in order to value co-creation?

RQ3: How does service innovation affect environmental sustainability?

ENVIROMENTAL SUSTAINABILITY

The World Business Council for Sustainable Development (WBCSD) defines sustainable development as “Sustainable development includes the pursuit of economic well-being, environmental quality and social equity at the same time. Businesses aiming for sustainability need to perform against a triple bottom line,

not a single financial bottom line.” (WBCSD, 2004). Economic, ecological, and social advancements are all part of sustainable development. The availability of technology, innovation tactics, and institutional conditions provided by government policies all play a role in the possibilities for optimizing these advances together (Vollenbroek, 2002). The concept of environmental sustainability is to add depth to sustainable development with the definition of “meeting the needs of the present generation without compromising the ability of future generations to meet their needs” (United Nations, 1987).

De Groot (1992) classified the three elements of sustainable development into nine categories based on environmental principles. It is expressed as;

- Ecologically (conservation and asset values),
- Socially (health, personal, community, and option values),
- Economically (consumption, productivity, and employment values).

These values are expressed as a source of direct human welfare. The majority of conservation value is found in life support functions. The well-being that individuals receive from knowing that some environmental function or aspect of nature persists is referred to as existence value. Many environmental functions influence human health, either directly or indirectly. People’s worries about maintaining environmental functions for future generations are the source of the choice value. The source provides the majority of the economic value of consumption and manufacturing usage, which decreases environmental functions. The value of employment is also derived from the service’s environmental duties. As an example of this value, the bulk of tourism is based on unspoiled natural areas (Ekins, 2011).

Environmental sustainability keeps track of the physical environment in order to control the direct and indirect consequences of large-scale operations like farming, transportation, and manufacturing. It also influences people’s purchasing and behavior choices. These criteria align with the objective of ubiquitous computing, which is to integrate computing intelligence in the physical world, human companies, and people’s lives (Woodruff and Mankoff, 2008). Environmental sustainability programs include actions such as reducing the use of physical resources, adopting a “recycle everything/buy recycled” approach, using renewable resources instead of finite resources, and redesigning manufacturing procedures and goods to eliminate harmful material production. As part of environmental sustainability programs, natural habitats and ecosystems that are valued for their livability or beauty are also safeguarded and restored. The following are some of the major environmental sustainability problems (Sutton, 2004):

- Destruction of habitats of native species

- Polluting chemicals and other pollutants are released into the environment
- Release of greenhouse gases that may cause climate change to the atmosphere
- Low-cost oil and other fossil fuels depletion

Some environmental challenges are critical on a local level, while others are regional or even global. In this setting, both enterprises and countries bear significant obligations for resolving environmental issues. According to Oláh et al., (2020), the flow of the manufacturing process from inputs such as raw materials, energy, information, and waste to the final product has a detrimental impact on the environment. On the other hand, the combination of Industry 4.0 and the Sustainable Development Goals improves environmental sustainability by providing ecological support that ensures high environmental performance with a greater positive effect than previously. Based on a survey of 120,000 hotel customers in 100 resorts across the United States, Bruns-Smith (2015) discovered that while hotel customers are usually willing to participate in sustainability programs, the presence of green activities does not override price and convenience considerations when choosing a hotel. According to this study, hotels' desire to engage in environmental initiatives improves when they are provided incentives, such as loyalty program points. Despite the fact that the relationship between ecologically sustainable programs and enhanced customer satisfaction is minimal when compared to other aspects (food and beverage, rooms, etc.), it is recommended that hotels keep sustainability programs as a regular component of their operations.

It is reported that the aviation industry, which carried 4.5 billion passengers in 2019, is responsible for approximately 2% of all human-induced CO₂ emissions and affects global warming by 3.5% when non-CO₂ effects are taken into account (ATAG, 2020). Bask et al., (2018), investigating the role of environmental sustainability in transportation operations, state that large shippers and carriers operating globally are most concerned with environmental issues, partly because of external pressures and partly because of the greening of transportation is a source of prospective competitive advantage. Mikosz (2021) aims for airlines to reach zero carbon emissions by 2050 in the report on the net-zero 2050 target of airlines. It is also intended to align its targets with the Paris agreement target to keep global warming below 1.5°C and to preserve the benefit of global connectivity for future generations. Orhan (2021) claims that airline liberalization policies and the methods that these policies promote are incompatible with the environmental sustainability of airlines. Buysse and Verbeke (2003) emphasize the relationship between projects and stakeholder management in their research based on environmental strategies. The issues of aviation interaction with the environment are addressed through targeted research efforts by all the major regulators of the industry. But it's also important to analyze airlines' current environmental policies to gain insight into how airlines understand and assess their

industry's environmental issues (Polat, 2022). Thus, it also states that proactive environmental strategies are related to the deeper and broader scope of stakeholders.

The S-D logic, which focuses on the livability and resilience of the service ecosystem, can be used as an enlightening and robust paradigm for environmental sustainability. The S-D logic is based on a multi-stakeholder approach, which allows for a better understanding of both positive and negative externalities that affect environmental and social sustainability (Frow and Payne, 2011; Lusch and Webster, 2011). In this approach, S-D logic adds to macro marketing theory and research while also providing a framework for environmental sustainability, ethics, social sustainability, and public policy (Vargo and Lusch, 2017).

VALUE CO-CREATION

S-D logic incorporates the notion of service as the primary driver of change and provides a theoretical framework for how businesses, consumers, and other market actors may collaborate to generate value via service interactions (Vargo and Lusch, 2004). S-D logic has emerged as an alternative to the G-D logic understanding in which organizations consume the value of the customers, where the value is produced by the firm. Value co-creation can be created by service providers and customers through the integration of resources and the application of competencies by using S-D logic (Vargo et al., 2008). Therefore, service science and value co-creation studies in service systems are built on the S-D logic (Maglio and Spohrer, 2008). Value creation is defined as a process in which at least two willing resource integrating players collaborate to create value, with services flowing from the provider to the customer in service-oriented organizations (Payne et al., 2008). Operant resources that facilitate and develop the processes of value co-creation with a S-D logic perspective are strategic resources that assume a central role for an organization to gain competitive advantage (Karpen et al., 2012; 2015). This strategic theme reflects the understanding that valuable network partners require meaningful interaction with their customers and mutual resource integration. Karpen et al., (2012) expressed the strategic theme as follows:

- *Value in context:* Appreciating value as a contextual and phenomenological consequence decided by individual consumers.
- *Relationship focus:* Seeing consumers as social relationship partners rather than solitary targets who benefit from collaborative partnerships.
- *Value focus:* Leveraging ethical considerations in long-term and co-improvement by understanding cooperative engagement and resource integration.

- *Co-production focus*: Recognizing consumers as valuable resources who can contribute to service processes and thereby enhance outcomes.
- *Operant resource focus*: Understanding of cornerstone for efficient resource integration and value creation thorough customers' available performative resources.
- *Process flow focus*: Viewing service as a series of interrelated resource integration processes that take place inside and between value networks in which consumers participate.

Each theme is strategic in that it addresses the terms of mutually and meaningful advantageous resource integration in the framework of S-D logic, from value propositions through value realizations (Karpen, 2012). Marketing is a term that refers to a set of basic principles that are based on the S-D logic;

1. Identifying and developing core competencies for competitive advantage,
2. Identifying customers who can benefit from these core competencies,
3. Establishing ties with consumers by providing value propositions that satisfy their requirements,
4. Focusing on ways to increase performance through interacting with consumers in order to co-create value (Vargo and Lusch, 2004).

To think strategically about how a firm does business and to illustrate how the business model framework may be utilized, Richardson (2008) defines the notion of value with three components:

- **Value Proposition**: It refers to what the business will offer its customers, why are customers ready to pay for it, and the basic approach to the firm's competitive advantage (Ex: offer, target customer, overall strategy and building blocks of competitive advantage).
- **Value Creation and Distribution System**: It is the method through which the company will generate and provide value to its consumers, as well as competitive advantage's source (Ex: value chain, resources, operating system, capabilities, and business operations, supplier, partner, and customer relationships).
- **Value Capture**: Describes how the business generates revenue and profits (Ex: income sources, economy of the business).

Yi and Gong (2013), on the other hand, consider "value co-creation as a third-order factor through the lens of the two theories". They refers to these two theories as customer engagement behavior and customer citizenship behavior in relation to the

		Customer			
Direct interaction	joint sphere	<u>Value creation</u>	<u>Independent value creation</u>	customer sphere	Indirect interaction
	<p>Customers' resources interact with service providers' resources in the composite dialogue process.</p> <p>Ex: A consumer visits a bank and requests a new debit card.</p>	<p>In an independent value creation process, customers' resources interact with service providers' resources.</p> <p>Ex: a client rips up his old bank card and discard it.</p>			
	joint sphere	<u>Value co-creation</u>	<u>Value facilitation</u>	customer sphere	
	<p>Service providers' resources interact with customers' resources in the composite dialogue process.</p> <p>Ex: The bank provides services to the customer in case he goes to the bank.</p>	<p>The service provider assists the customer in creating value with the resources available in the client area.</p> <p>Ex: The bank sends the consumer the debit card via e-mail.</p>			
		Service Provider			

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A business's sustainability value may be divided into three categories. These include environmental values like low waste, low emissions, biodiversity, renewable resources, pollution prevention, and social values like equity, well-being, community development, labor standards, health and safety, as well as economic values like profit, return on investment, financial resilience, long-term viability, and job stability (Cancino et al., 2018). Environmental value creation is also connected to the appropriate use of resources like water and raw materials, as well as respect for ecosystems, humans, and animals' general well-being (Rosca et al., 2017). Increased resource efficiency through the use of renewable energy sources is frequently associated with business strategies that aim to produce environmental value (Bocken et al., 2014). Grunwald (2022) proposed a model based on the generic input–process–output (IPO) paradigm in organizational psychology. This model presents a conceptual input–process–output framework to uncover managerial issues and consequences at various levels of sustainability co-creation. In the context of sustainable co-creation, data and information about safe ways to use raw materials or preliminary products, as well as new areas of use in the value chain, could be used as input. The own business or product brand image could be adopted as an immaterial input into co-creation activities in exchange for proper consideration, making it usable for other services or cooperation partners. As material inputs, digital tools and platforms, as well as industrial processes, can be utilized. The output is the perceived value of the received services, such as an increase in sustainability performance, access to new market sectors, and long-term competitive advantage.

SERVICE INNOVATION

According to the S-D logic, the multiple meanings of service are important to the conception of innovation. Rather than being viewed as a product (i.e., new goods or services), innovation is viewed as a process in which a supplier and a user work together to find methods to successfully integrate resources and generate value. An innovation does not have to be technological from the standpoint of S-D logic; it can also refer to a product being utilized in new ways, for as in a different context, time, or area. Once again, the beneficiary is the one who defines the worth of an innovation that emerges from the combination of resources, environment, and experience (Mele et al., 2014). In this respect, it is less crucial how technically revolutionary new technology is for new kinds of value cocreation to develop than whether customers and other players understand how this technology may be used and become valuable (Korper et al., 2021). Technology is the application of knowledge in a practically. Therefore, technology, innovation, and service are all intertwined. It is the use of specialized knowledge and abilities for the advantage of another actor

or for the actor himself, according to S-D logic. According to the S-D logic, service innovation is technology (based on operant resources), but it also often generates newly operand resources (Lusch and Nambisan, 2015). Service innovation refers to a focus on the customer. As a result, interactive actions in the service network based on S-D logic are required.

Mele et al., (2014) evaluate the studies on innovation from the perspective of S-D logic and describe them as three main focus points:

- Conceptualization of innovation and its connection with value co-creation;
- Customers as co-innovators;
- Network of actors participating in innovation.

Table 1. Main research contributing to innovation according to S-D logic (Mele et al., 2014)

Focus	Main Topics	Related Authors
Innovation concept	Value innovation New value propositions New solutions and new experience Co-creation Implementation of competencies	Sawhney (2006), Lusch, Vargo and O'Brien (2007), Michel et al., (2008a,b), Maglio and Spohrer (2008), Borghini and Caru' (2008), Vargo and Lusch (2008a,b), Mele (2009), Nam and Lee (2010), Ordanini and Parasuraman (2011), Edvardsson and Tronvoll (2013)
Network and the role of actors	Operant resource Resource integration Co-production and co-creation Network value Value innovation Open process	Lusch et al., (2007), Cova and Salle (2008), Gummesson and Polese (2009), Nam and Lee (2010), Lusch et al., (2010), Mele et al., (2010), Chandler and Wieland (2010), Mele and Polese (2010), Vargo and Lusch (2011), Ordanini and Parasuraman (2011), Edvardsson and Tronvoll (2013)
Role of customer	Operant resource New value proposition Value in use and value innovation Co-producer and co-innovator Value co-creator Open process	Sawhney (2006), Borghini ve Caru' (2008), Michel et al., (2008), Mele (2009), Chesbrough (2011), Ordanini and Parasuraman (2011), Rubalcaba et al., (2012)

- **Value-Based Conceptualization of Innovation:** It is proposed that service innovation be viewed as value innovation. According to S-D logic, value innovation is defined as “a new combination of existing competencies to develop new competencies or to provide new or increased benefits to one or more parties” (Vargo and Lusch, 2008a; Mele, 2009). Businesses involved in value innovation generate information, absorb knowledge, and deliver it to

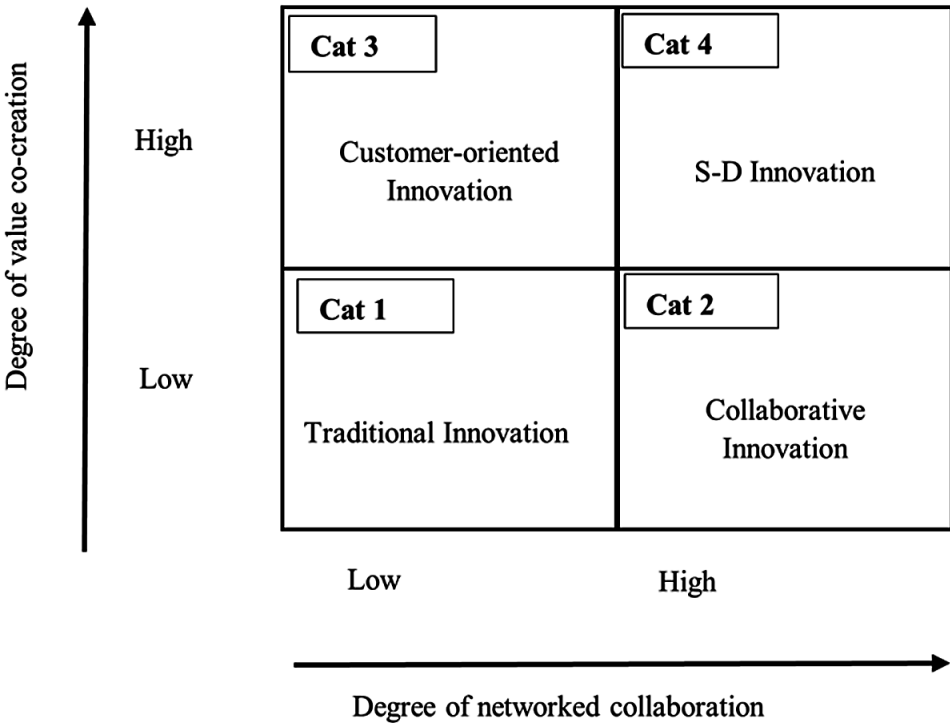
participating customer using their own competences to realize the value in use, according to the idea (Mele et al., 2014).

- **Innovation through the Network:** Innovation is no longer seen as a rare occurrence in S-D logic, as it is in G-D logic. Rather, it is viewed as a nonlinear process that is also continuous, systematic, and dependent on complex interactions among people, activities, and diverse resources. Researchers suggest that innovation is viewed as a network issue rather than a supplier or consumer worry, which is consistent with this idea (Mele et al., 2010; Nam and Lee, 2010). Customers, provider, and other stakeholders reveal interactive networks of interactions that generate value through resource sharing and integration. The customer becomes the user (or stimulus) of innovation, while the provider becomes the innovator, as a result of network thinking (Mele et al., 2014).
- **Customers as Co-Innovators:** Customers and service providers may co-create innovation under the service innovation model (Rubalcaba et al., 2012). This assumption allows inventive new offers to discover new methods to fulfill the demands of customers. Customers are no longer considered customers and users of a value-added good or service, but rather co-creators who acquire a new value proposition and engage in value creation activities (value in use) in order to obtain value from usage. Customers are becoming more involved as co-innovators in the development of new value propositions, and co-production of creative solutions based on their ideas, knowledge, time, and other resources (Von Hippel, 2005; Mele et al., 2014).

S-D logic brings a new perspective to service innovation and proposes the integration of various service innovation concepts (Baker and Sinkula, 2007). Ostrom et al., (2015) stated that technology has been accepted as a game-changer in the service business, however, the transition from new technologies to distinctive value co-creating solutions has proven tough. Innovation emerges as actors seek improved avenues and better density for co-creation of value, and the service platform becomes important to help this happen. All of the key concepts and challenges underpinning the broader viewpoint of service innovation are covered, along with service ecosystems, service platforms, and value co-creation (Lusch and Nambrisan, 2015). Service innovation refers to a customer focus. Therefore, interactive actions in the service network based on S-D logic are required. Based on this situation, a framework for service innovation is constructed, and two-dimensional service innovation categories are offered. Degree of co-creation and networked cooperation are the two categories (Nam and Lee, 2010). The degree of co-creation recognizes that the customer is not just a passive buyer. Rather, the customer is a value co-creator. Thus, the business and the customer participate in the important activities

of creating services together (Payne et al., 2008). For interconnected resources, networked collaboration underlines collaborative interaction with all participants (Basole and Rouse, 2008).

Figure 2. Typology of service innovation
(Nam and Lee, 2010)



Category (Cat) 1 - Traditional Innovation: Innovation in this category is described by both the low degree of co-creation and the low degree of networked cooperation. In a product-based economy, this type of innovation thrives, allowing businesses to become market leaders in the provision of utility or value.

Cat 2 – Collaborative Innovation: This category refers to innovation characterized by a low degree of co-creation practices and a high degree of networked cooperation. This innovation encourages service providers, partners, suppliers, and customers to work together actively. It does not, however, consider the consumer as a co-creator; rather, it recognizes that customers play a critical role in the creation of value.

Cat 3 - Customer-Oriented Innovation: This category is for innovation that involves a lot of co-creation but not a lot of networked cooperation. Individual clients are invited to actively provide valuable service through individualized contact in this form of innovation (Prahalad and Ramawsamy, 2003).

Cat 4 - Service Dominant (S-D) Innovation: This category encompasses innovation that necessitates a high level of co-creation as well as networked cooperation. Through the collaborative efforts of providers, consumers, suppliers, partners, and other actors, the value of this innovation is co-created and differentiated by diverse customers. Therefore, customers may know how to co-create value by incorporating or using a business offer (Michel et al., 2008a; Nam and Lee, 2010). This category entails actors not only understanding and interpreting their own or collective competence as adequate for resource integration as well as comprehending and interpreting the value proposition as substantial and potentially value-creation. As a result, the service innovation building blocks are accompanied by underlying meaning-making mechanisms (Korper et al., 2021). Vargo and Lusch (2008b) propose three actuators for service innovation using S-D logic. These are collaborative competences, customer orientation's dynamic capability, and information interfaces. Customer and business partner cooperation are examples of collaborative capabilities, and the S-D logic promotes competitiveness through customer engagement, collaboration between actors in the value chain, and staff engagement. By partnering in this way, businesses may obtain access to information and acquire a competitive advantage. Businesses use co-creation and co-production to achieve a competitive advantage with consumers and value chain partners, and operational resources can build new knowledge and capabilities to gain a competitive advantage (Lusch et al., 2007).

Sustainable innovation research is rapidly expanding to improve understanding of new clean technologies like eco-innovation and the means of social practices by fostering technological and organizational changes in the present production systems' knowledge base, allowing societies to become even more sustainable (Larson, 2000; Hall and Clark, 2003; Hellström, 2007; Montalvo, 2008; Boons et al., 2013; Anttonen et al., 2013; Oksanen and Hautamäki, 2015; Guo et al., 2020; Sumrin et al., 2021). Ayres (1996) concentrated on the sorts of technological innovation that would be required in order to ensure an actually sustainable future, emphasizing that wealth may be accounted for not just by and directly by economic development, but also by technological and scientific advancement. The eco-innovation approach develops as a reaction to the requirement for resources employed by the inclusion of different and innovative technologies rather than the new use of existing technologies in the environmental component of sustainability (Huber, 2000). Carrillo-Hermosilla et al.

(2010) compiled a list of definitions of eco-innovation and environmental innovation, as well as their own definition of eco-innovation as “innovation that enhances environmental performance”. To meet customer demand, companies like BMW, Patagonia, and The Body Shop have embraced sustainable processes and produced new eco-products. Nestle, on the other hand, has been the target of an aggressive and highly nasty Greenpeace social media campaign, despite the fact that one of its palm oil suppliers has been accused of contributing to rainforest destruction. Airbus has succeeded in flying a passenger plane that runs on fuel made from spent cooking oil. Airbus stated that the plane specially designed for the project took off from a runway in France and stayed in the air for three hours (Çakır, 2022). As a result, sustainable marketing should be addressed not only from the standpoint of the “end-consumer,” but also from the perspective of the “vertical network of business partnerships” (Lacoste, 2016). Carfora et al. (2017) suggest that consumers’ pro-environmental self-identities moderate the effect of perceived behavioral control on intentions that influence past behavior. Ford and Despeisse (2016) reveal that there are benefits to technology adoption for environmental sustainability, but that these benefits, realized at every immature stage of technology, also face significant challenges.

Table 2. SOI Model (Adams et al., 2016)

	Optimization of Operations	Transformation of the Organization	System Creation
Strategy	Complying with regulations or focusing on efficiency gains	Embedding sustainability as a strategic and cultural norm with an understanding that goes beyond greening	The case for wide partnerships and investments in systems solutions in order to generate new value co-creation propositions
Process	Internal and gradual innovation are emphasized with the help of technologies	Adopting new values, platforms and new idea applications	Adopting new collaborative process platforms in collaboration with different actors
Learning	Using the current information management system to locate and retrieve relevant data	Interacting with the key stakeholders of the company	Developing versatile skills that enable “shadow tracking” and learning from experiments with a number of new approaches
Links	Recruit high-level domain specialists for new knowledge	Shifting the focus from internal connections to collaboration with close stakeholders	Diagnose issues, comprehend system complexity, establish trust, and find tools for change by focusing on the complete system.
Innovative organizations	Leveraging existing innovation capabilities	Adopting a sustainable-oriented innovation approach to organizations	Adopting new business paradigms

Adams et al. (2016) provide a Sustainability-Oriented Innovation (SOI) model (Table 2) that may be used to map sustainability focused innovation behaviors and processes. This model;

- **Optimization of Operations:** Operational optimization refers to a “doing better with the same” approach to minimizing damage through reactive, incremental changes driven by compliance or proactively measuring efficiency, and it represents an internal viewpoint on sustainability. These are often technical, self-contained, and isolated pursuits.
- **Transformation of the Organization:** Organizational transformation via innovation necessitates a fundamental shift in attitude and purpose (doing better by doing new things) from “doing less harm” to co-creating value and offering broader societal benefits. It is marked by a reinterpretation of internal and external links, which are progressively understood in terms of context, environmental, and societal implications.
- **Systems Creation:** System structure necessitates a conceptual change beyond the enterprise and a rethinking of the role of business in society. “do better by doing new things with others”

Purposeful changes in a business’s ideology and values, as well as its outputs, processes, or activities, with the goal of providing environmental and social value besides financial gains, are described as sustainability-oriented innovation (Adams et al., 2016). Sumrin et al. (2021) stated that moving from incremental to radical innovation is related to innovation in the context of sustainability (Klewitz and Hansen, 2014), but it would be a more realistic approach for companies to take steps toward incremental innovation before switching to radical innovation. Small adjustments and efforts made by firms toward sustainability, they claims, would be overlooked if innovation is only perceived as radical innovation. As a result, understanding the multiple nature of service innovation in order to explain the change that is complicated, dynamic, and progressively integrated into interactive technology is a significant subject of the research (Ostrom et al., 2015).

Businesses can also create value through innovation. Innovation can be defined as improving an existing service, or it can also be expressed as a new resource combination that responds to an unmet market need and creates more value than the cost of the necessary resources to be used. It can be said that businesses often do not have resources, and they can be rented to serve customers (Ateş, 2007). Airbnb can be an example of this situation, and we can also state that airlines can rent aircraft instead of buying them when entering new markets. In this approach, the way to create value is not to have a valuable resource or a defensible position, but to effectively manage the uncertainty inherent in trying something new. This is

also an important issue for environmental sustainability. Businesses both reduce their costs and contribute to environmental sustainability by avoiding waste of resources while eliminating uncertainty.

CONCLUSION

Businesses have been obliged to pay more attention to sustainability concerns as a result of an increase in environmentally concerned customers. Therefore, there has been a growing understanding that firms' lack of interest in sustainability concerns might put them at a competitive disadvantage. Customer-focused innovation enables customers to access a business's technology or seek help with service development. This shows that businesses are often able to obtain and apply customers' more implicit information sheets to renew their services or products. Innovation is no longer seen as a extraordinary situation occurrence in S-D logic, as it is in G-D logic. Rather, it's seen as a nonlinear process that's also continuous, methodical, and reliant on complex connections between people, activities, and a variety of resources. Innovation is perceived as a network issue rather than a service provider or customer worry, according to studies (Mele et al., 2010; Nam and Lee, 2010).

The broad adoption of new technologies, as well as the associated manufacturing, distribution, and disposal processes, such as electronic trash, might pose a threat to the environment's sustainability. For example, the growth of mobile phones, which may be called a ubiquitous technology, might be considered a sustainability concern. The extensive literature on this issue is revealed that the material hazards and toxic effects of mobile phone destruction (Woodruff and Mankoff, 2008). In terms of environmental sustainability, the capacity of the environment to absorb the wastes that would develop in the service system should not be overlooked by imposing restrictions that guarantee that natural resources are used at a constant pace that does not exceed the rate of regeneration. Furthermore, as an alternative to non-renewable natural resources, enterprises should concentrate on renewable natural resources (Zhu et al., 2015). In order to fulfill this responsibility, it is an important issue for businesses to review and revise their strategies. Managers must be able to identify ways for their companies to become more socially responsible, ecologically sustainable, and competitive (Baron, 2001).

There are many issues that service businesses need to focus on corporate environmental sustainability. At the beginning of these is the issue of preventing pollution related to air, water, and soil pollution. By adopting the zero-waste practice, service businesses can prevent pollution with the aim of reducing their carbon footprint by using less energy and water in their facilities. Also, they can conserve resources by learning to use resources efficiently, ethically and responsibly

such as water, energy, and raw materials. The efficient use of water in areas such as toilets and landscaping in its facilities, the establishment of an automatic light switch-off system, and the preference for energy-efficient products can be given as examples. Service businesses can also contribute to environmental sustainability by adopting clean energy, greening the planet, and making the service process sustainable. Innovation can accelerate environmental sustainability initiatives and is considered an important part of achieving sustainability goals. In order for businesses to develop a more environmentally sustainable strategy, they need to adopt an understanding of innovation on the basis of S-D logic and set clear targets for this. If service businesses understand what environmental sustainability means for their industry and their customers, they can establish their mission and create a long-term strategy based on that understanding (Arıca and Kafa, 2020). It will contribute to the creation of environmental value and environmental sustainability if the enterprises seek solutions that increase environmental welfare by addressing the existing environmental problems and adapting this to all units of the enterprises. it is also important because of the activities required to meet the United Nations' Sustainable Development Goals (SDGs) (Melo et al., 2021). Therefore, it is necessary that businesses create a corporate culture and instill this culture in their employees. Otherwise, the demands of customers with high environmental awareness are not met will make it difficult for businesses in terms of competitive advantage.

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KEY TERMS AND DEFINITIONS

Environmental Sustainability: That emphasizes the need to prevent the waste of resources of future generations while meeting current needs.

G-D Logic: It refers to the processes in which the value is only consumed by the customers and focused on the produced product.

S-D Logic: It is the approach that expresses the creation of value in the joint interaction between the business and the customer.

Service Innovation: It is a concept in which service improvements are included in the process of innovation, which is not just about invention.

Value Co-Creation: It is the process in which information flow is provided and value is created in a transparent environment in the interactive process between actors.

Chapter 7

Defining and Measuring the Perceived Quality of a Virtual Community

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ABSTRACT

Despite the development of social networks and virtual communities, there is no specific scale measuring the perceived quality of a virtual community. This research is part of this perspective and attempts to propose a scale to measure the perceived quality of a virtual community. To achieve the objective, a qualitative study was carried out with the technique of “brain writing” for the generation of items and a quantitative study with 343 members of virtual communities was conducted. The results show that the perceived quality of a virtual community is a multidimensional concept and confirms validity and reliability.

INTRODUCTION

With the development of digital marketing and technology, virtual communities have become increasingly popular, bringing together individuals from different cultures and civilizations. The increasing use of new information technologies

DOI: 10.4018/978-1-7998-9553-4.ch007

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has made the distances between individuals and companies disappear (Wind and Mahajan, 2002). Virtual communities are thus seen as an essential component of modern society, whether in the private lives of individuals or even in the activities of organizations. Successful communication on social networks represents a major challenge for companies (Borah et al. 2020). Indeed, the rapid development of communities has also influenced user behaviour by allowing them to build a richer experience. Similarly, companies can take advantage of virtual communities to increase sales (Brown, Tilton and Woodside, 2002), to benefit from positive word-of-mouth with a strong potential for propagation (Bickart & Schindler, 2001, Consiglio et al., 2018) also to know market trends (Bickart & Schindler, 2001) or even to increase traffic to an e-commerce site (Bughin and Hagel, 2000). Indeed, individuals increasingly rely on conversations in virtual communities (Hughes et al. 2019). A virtual community is different from a website in that the information that exists on the networks is user-generated and the company is no longer the only source of information. Consumers who are members of a virtual community can easily exchange their positive or negative experiences. With these changes in the relationship between consumers and the company, the classic dimensions of service quality assessment lose their robustness and become archaic. As a result, and it is very important for companies to understand the attributes on which customers evaluate the quality of a virtual community (Othmani and Bouslama 2014). The objective of this research is therefore to develop a reliable and valid measurement scale of the perceived quality of a virtual community.

This paper is organized as follows: initially, the theoretical framework referring to the problematic that will be exposed, and then the methodology of developing the measurement scale will be presented. Finally, the results and the limitations, contributions and paths for future research will be shown and discussed.

BACKGROUND

A virtual community of brand is defined as a group of consumers who come together in a digital space and share common interests and needs. It is a consortium formed by individuals or organizations with common values and interests in a semantic space shared by electronic tools in a computerized space where the content is generated by the users (Hagel 1997). In the literature, there are several definitions of this concept according to Rheingold (1993). A virtual community is an aggregation that emerges in cyberspace when there is a grouping of a sufficient number of members capable of carrying out discussions, sharing enough feelings to form networks of personal relationships. They represent a virtual space that plays several roles in the lives of the members who form the community. So, a virtual community is a group of

people who communicate via e-mail, the Internet, mail, telephone, for professional, social, educational, or other reasons. It brings together individuals, whose purpose is to create relationships with each other, share common goals and interests, as well as obtain social support. For some authors, virtual communities can play an important role in trade (Hagel and Armstrong, 1997; Pentina et al, 2008; and Zhou et al 2007). Indeed, individuals in virtual communities are motivated to engage in online commercial activities particularly when individuals form strong relational networks and when trust between members is strong (Ridings et al. 2006). Also, members in virtual communities discuss the quality of products or brands among themselves by sharing information about price, product effectiveness, reputation, previous experiences of use, or defects and possible problems with a commercial offering (Hung et al. 2007).

The Concept of Perceived Quality

Perceived quality can be defined as the customer's perception of the overall quality of a good or as the superiority of a product or service over the trend of customer choices (Aaker, 2011). Perceived quality is thus a general and intangible feeling and is not necessarily based on the customer's knowledge of mundane characteristics. According to Giordano (2006) it is the set of sensitive and sensory impressions and cues that seduce and attract attention at first glance, interpreted by the customer as a promise of quality that gives him or her confidence, and that satisfies in use. For measuring the electronic service quality researcher identifies many dimensions (Yang and al. (2004), Wolfinbarger and Gilly (2003)). Most of the e-service quality scales are limited to measure the website 1.0 quality like the "webqual" (Loiacono et al. 2000), the "e-qual" (Kaynama and Black 2000) and the "e-SQUAL" (Parasuraman and al. (2005)). Table 1. show the dimension on online perceived quality identified by previous research. Until now there is no measurement scale of web2.0 websites and online community perceived quality.

Table 1. The dimensions of online perceived quality

Authors	Online Perceived Quality Dimensions
Al-Tarawneh (2012)	Ease of use, Security, responsiveness, website design, personalization, and reliability
Ho and lin (2010)	Customer services, Assurance, website design, Security, information provision and preferential treatment.
Bressolles (2004)	Ease of use, reliability, design, security/privacy and information.
Yang and al. (2004)	Reliability, accessibility, ease of use, attention, security and credibility
Parasuraman and al. (2005)	Accessibility, efficiency, ease of navigation, flexibility, reliability, customization, security/privacy, responsiveness, assurance, site aesthetics and knowledge
Wolfenbarger and Gilly (2003),	Site design, reliability, security/privacy, and customer service.
Aladwani and Palvia (2002)	Specific content, content quality, appearance, and technical competence
Loiacono and al. (2002),	Usefulness, ease of use, entertainment, and complementary relationship

Furthermore, perceived quality is a subjective judgement constructed in the mind of the user and it is the user who determines its value; hence each dimension of a product or service may have a different perception of quality (Yu et al. 2005).

Most of these studies show that the perceived quality varies depending on the needs of users (Parasuraman et al., 1985; Gattorna and Walters, 1996). Many authors agree that the perceived quality of a website is a multidimensional concept, the table 1. shows that a substantial review of the literature does not pretend to be exhaustive; it is nevertheless robust studies in this field of research.

The Perceived Quality of a Virtual Community

The perceived quality of a virtual community is a part of the theoretical field of digital quality. The perceived quality of a virtual community is defined as the judgement of the user member of the virtual community of the degree of excellence of this community compared to other communities, this concept is part of the theoretical field of digital quality (Othmani and Bouslama 2014). Othmani and Bouslama's initial exploratory research on this concept suggest that to assess the perceived quality of a virtual community the user members of this community rely on five dimensions namely the quality of the members forming this community, the quality of the content, the popularity of the virtual community interactivity and security (Othmani and Bouslama 2015).

1. The Quality of Members

Unlike an Internet site from the web 1.0, in a virtual community we can know the members that make up this community and even their general characteristics like the level of expertise, seriousness and sometimes their social class (Bousslama Othmani 2014). One of the main characteristics of virtual communities is the generation of content by users who participate to grow their knowledge, exchange, or solve their problems (Hsua et al 2006) and unlike a traditional website, users are known and can affect the overall perception of this community.

In addition, the professional knowledge and skills of good members of online communities can be exchanged with other community members (Moser et al., 2017) so this can improve the perceived quality of online communities. Not only the members of a virtual community will improve their skills but also business administrators could utilize their communities to interact and communicate with customers to get important business information, to meet customer needs and maintain their competitive advantage (Lee et al. 2022)

2. Interactivity

As the quality of members, interactivity, which is a characteristic generally associated with virtual communities (Leiner and Quiring 2008), is the ease of direct communication between several companies or users without time or spaces constraints (Blattberg and Deighton 1991). It is then, the ability of users to share and edit the content in a real time (Steuer, 1992). Accordingly, interactivity is the exchange between a transmitter of content and a respondent.

Numerous studies have also identified that interactivity helps to build a good relationship with customers in large firms (Ghose and Dou, 1998). On social networks we can talk more about interactivity between users, or “user-user interactivity” represented by a collaborative exchange between two or more users (and Mahmoud Auter 2009), giving them more freedom in the exchange and change messages (recommendation, reviews...) to satisfy their need (Liu and Shrum 2002). Some researchers have shown that interactivity can have a positive impact on the attitudes of the user (Wu 1999)

3. The Quality of Information

Information quality is the key driver of any information system quality (Nelson et al. 2005). Previous research considers that the quality of information as it can be defined as the capacity to meet or exceed information users’ expectations (Evans

and Lindsay 2002) also the coherence of information regarding the specifications of the product or the service to which it refers (Kahn et al. 2002).

The quality of information presents the inherent value and the usefulness of the content in a website (Huizingh 2000). This is the perceived value by the users of a website or a virtual community. The information quality can be used on customer decision-making and can support managers to grow their organizations (Pinho et al. 2022 ;Kashani et al. 2017)

Traditionally, the quality of information is one of the main dimensions of the perceived quality of a web (Subramanian et al. 2014, Ho and Lin 2010 Katerattanakul and Siau 1999, Strong et al. 1997). Just like for a traditional website, the quality of information in a virtual community is a fundamental part of the perceived quality (Othmani and Bouslama 2014).

4. Security

The perceived safety can be defined as the degree of reassurance for consumers in the use of technology (Chiu et al. 2009; Taylor and Strutton 2010). Security is a major challenge for web marketers because any event can cause heavy losses for the company (Pantano et Di Pietro 2012). Perceived security is the level of trust that a particular action will be performed without any security breach (Mekovec and Hutinski, 2012). According to Lim et al. (2019), the perceived security is the level of trust that the buyer will fulfil security requirements, such as integrity, authentication, and encryption.

5. The Popularity

On virtual communities, many tools can be used to grow the popularity of the communities. The popularity of virtual communities facilitates chance encounters among large numbers of interlocutors while allowing for meaningful interaction (Research on participation patterns on Usenet (Panek 2018 et al.). Online community size can also stimulate the contributor turnover. Using a resource-based model of online group dynamics (Panek 2018 et al.), according to Butler (2001) increasing the size of online communities have a positive the sustainability of online groups also the big community attracts more new members than small communities (Butler, 2001). In fact, on the virtual community members can easily identify the number of people belonging to this community, and the number of people who talk about it. According to Freud (1921), in a crowd, the individual is not aware of his actions; he is struggling with the suggestion that abolishes its judgement but may instead reveal other “faculties” in extreme happiness (Freud, 1921). “In a crowd, every feeling is

contagious to the point that the individual easily sacrifices his own interests for the sake of the collective interest” Freud, 1921).

METHODOLOGY

To develop the scale for measuring the perceived quality of a virtual community of brands, we used the “Churchill’s Paradigm” (1979) while considering Rossier’s (2002) recommendations on the fact that researchers should use reason with the objective of ensuring that the resulting scale is represented by the appropriate items. For this paper we start with the second exploratory phase which, according to Churchill, consists of generating a sample of items based on the literature and expert opinion. We opted for the “Brain Writing” technique to generate as many items as possible, which made it possible to update a certain number of criteria for judging the perceived quality of a virtual community according to the five dimensions selected. We were then able to develop 37 items, which were then presented to four marketing experts (two professors and two digital marketers) to judge their relevance to the concept to be measured. That is, based on the literature review and qualitative studies, we were able to develop 37 items relating to each dimension of the perceived quality of a virtual community.

In a second phase, we distributed to 10 experts (50% academic and 50% professional) the definitions of the dimensions of the concept and asked them to read all the items and then to tick which dimension it belongs to. As a result of this step, we deleted 8 items and reformulated 4 items.

The third step consists of the first data collection with the objective of reducing the number of items retained in the second step on a reduced sample. The questionnaire was distributed exclusively in virtual communities. This sample of convenience includes 41% men and 59% women. In addition, 77% of the respondents have been using the brand’s virtual communities for more than 3 years.

The fourth step is the analysis of the results of this first collection with the aim of purifying and reducing the number of items. The fifth step is to carry out a second collection of information by eliminating the items that do not correspond to the measurement standards. In this stage, we distributed the questionnaire to 218 consumer members of the virtual communities. The questionnaire was distributed exclusively in virtual communities. This convenience sample was 39% male and 61% female. In addition, 79% of the respondents have been using virtual communities for more than 3 years.

SOLUTIONS AND RECOMMENDATIONS

For data analyzing, we used SPSS 20 and AMOS 20 software. To purify the initial set of items, principal component analyses with varimax rotation were conducted. The Kaiser, Meyer and Olkin index indicates that the data are “factorable” ($KMO=0.721$). The Bartlett’s sphericity test is significant and allows to reject the hypothesis that the correlation matrix is equal to the identity matrix. Two criteria were used to refine the items. Firstly, the item must have the saturation of more than 0.5 and present satisfactory commonality. On the other hand, the difference in the factor scores of an item correlated to more than one factorial axis must be greater than 0.3. Table 2 (Appendix 1) summarizes the main results.

Reliability and Validity of the Developed Scale

The alpha ranges from 0.748 to 0.856 and the Jöreskog’s rho ranges from 0.772 to 0.895. The internal consistency coefficients are satisfactory, so we can conclude that the scale is reliable.

Validity allows us to assess whether the instrument used measures the construct it is really supposed to measure (Evrard, Pras and Roux, 2000). Several types of validity will be examined: content validity, trait validity (convergent and discriminant validity) and predictive validity. To test convergent validity we used the pVC index which must be greater than 0.5 (Fornell and Larcker, 1981) and to measure discriminant validity we opted for the method of (Roussel et alii, 2002) which consists of showing that a model where the correlations are free is much better than one where the correlations between the latent variables are fixed at 1. According to Table 2. (Appendix 1) both conditions are fulfilled. We can therefore conclude that the scale is valid. The items retained after purification are presented in Table 3. (Appendix 2)

CONCLUSION

Perceived quality is a key concept in marketing that evolves over time and requires special attention from the point of view of theoretical foundation and measurement. In this paper, we have studied the second aspect by trying to develop a reliable and valid measurement scale of the perceived quality of a brand’s virtual community.

According to the research results, the perceived quality of a virtual community is a multidimensional concept that has five dimensions and can be defined as the judgement of the user member of the virtual community of the degree of excellence of this community in comparison with other communities.

The theoretical scope of the scale developed is situated at several levels. Indeed, the consideration of the specificities of a virtual community during the creation of this scale is a rather important innovative aspect of the research. Indeed, companies present in social networks with virtual communities must understand that the perception of quality by visitors to their sites is different from the perception of quality by consumer members of a virtual community. A merchant must therefore pay attention to the number of subscribers to his community, the speed of information flow, as well as the content generated by users. This study also provides a definition of the concept: the perceived quality of a virtual community can be defined as the judgement of the user member of the virtual community of the degree of excellence of this community compared to other communities. This judgement is made based on five dimensions of the perceived quality of a virtual community: interactivity, security, usefulness, popularity, and quality of members.

From a managerial point of view, the scale for measuring the perceived quality of a brand's virtual community developed in this research presents a reliable and valid measurement tool that could be used by practitioners to measure the perceived quality of their virtual communities.

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KEY TERMS AND DEFINITIONS

Interactivity of Virtual Community: The ease of direct communication between several companies or users without time or spaces constraints.

Measurement Scale: Is a tool with a predetermined number of responses that can be used to obtain an answer to a question and measuring variables.

Online Community: A groups of people who communicate with each other via electronic media without any restrictions.

Perceived Quality of Virtual Community: Is the judgement of the user member of the virtual community of the degree of excellence of this community compared to other communities.

Security of Virtual Community: The level of trust that a particular action will be performed without any security breach on a virtual community.

APPENDIX 1

Table 2. Perceived quality of the virtual community index

Perceived Quality of the Virtual Community									
Items	λ	Factor Contributions					Cronbach's Alpha	Jöreskog's ρ	ρ CV
		F1	F2	F3	F4	F5			
INT4	,772	,818					0,831	0,895	0,681
INT6	,793	,807							
INT9	,806	,843							
INT10	,802	,832							
SEC1	,733		,804				0,824	0,866	0,677
SEC6	,662		,799						
SEC7	,816		,863						
UT5	,717			,707				0,837	0,633
UT7	,858			,862					
UT8	,836			,810					
POP2	,698				,782		,856	0,820	0,603
POP4	,775				,786				
POP5	,714				,762				
MBR1	,793					,883	,748	0,772	0,537
MBR2	,672					,711			
MBR3	,714					,572			
Component Value		3,254	2,483	2,269	2,168	1,914	KMO=,858		
		Varimax					Signification of Bartlett =,000		
		20,339	15,517	14,181	13,549	11,963	N=218		
Adjustment index of the model for measuring the perceived quality of a virtual community									

Continued on following page

Defining and Measuring the Perceived Quality of a Virtual Community

Table 2. Continued

Perceived Quality of the Virtual Community										
Items	λ	Factor Contributions					Cronbach's Alpha	Jöreskog's ρ		ρ CV
		F1	F2	F3	F4	F5				
X ²	ddl	χ^2 /ddl	RMR	RMSEA	GFI		AGFI	TLI	CFI	BIC/BIC SATURE
215,122	94	2,289	0,084	, 077	, 896		, 850	, 917	, 935	441,271/732,291

$AVE(\xi_h) > Cor^2(\xi_h, \xi_k)$ for $k \neq h$

Table 3. Convergent validity test

Scale Dimensions	(cor ²)					$\rho_{VC(AVE)}$
	Interactivity	Security	Utility	Popularity	Quality of Members	
Interactivity	1					0,681
Security	, 127	1				0,677
Utility	, 357	, 170	1			0,633
Popularity	, 264	, 130	, 275	1		0,603
Quality of members	, 417	, 334	, 334	, 136	1	0,537

APPENDIX 2

Table 4. Statement of the scale for measuring the perceived quality of a virtual community

Dimension Items	Items of Scale
Interactivity	<ul style="list-style-type: none"> • In this community I can share my opinion without restriction • The members of this community can exchange easily • Questions are answered quickly • This community is dynamic • In this community I get information at the right time
Security	<ul style="list-style-type: none"> • This community respects my personal information • This community guarantees spam protection • I trust that the community manager will not use my information for commercial purposes • I feel safe adopting the information of this community
Utility	<ul style="list-style-type: none"> • This community is rich in useful information • This community is rich in relevant information • In this community I can build good relationships with experts • In this community I can exchange useful information on a specific topic • In this community I can develop relationships with all members of the group • In this community I can always find help
Popularity	<ul style="list-style-type: none"> • This community is recognised • This community is attractive • In this community I feel surrounded • This community is liked by many social network users
Quality of members	<ul style="list-style-type: none"> • Members of this community are experts • Members of this community are collaborators • Members of this community are known for their reliability • Members of this community are willing to share their good and bad experiences • Members of this community are willing to share and exchange information

Chapter 8

Data Mining for CRM: Extracting Customer Knowledge From Data

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ABSTRACT

The growth of existing customers' database made by the availability of a large volume of customer data and modern information technologies make the use of data mining tools both a necessity and an opportunity. Several research studies have drawn attention to the interest of applying knowledge discovery in data (KDD) and data mining methods to extract customer knowledge. These methods would improve the customer knowledge management (CKM) process and equip decision-makers with better knowledge about their customers to better serve them. The purpose of this paper is to show customer relationship (CRM) process steps and related objectives with appropriate data mining methods and techniques for better marketing decision making.

INTRODUCTION

The appreciation given to the economic value of customer data and customer information is not recent. It dates back to the first accounts on the creative resources of the competitive advantage.

DOI: 10.4018/978-1-7998-9553-4.ch008

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The resource-based view keeps track of these accounts, and the literature on business intelligence and information systems backs them up.

Such a recognition initially focused researchers' efforts on the search for methodological and technological means allowing for automating efficiently the acquisition, the storing and the dissemination of a huge amount of customer data potentially available in the organization's information systems.

Then, and faced with "information overlap", the difficulties of information processing, development and exploitation for decision-making surfaced. The issue of effectively processing information available to businesses has been identified as problematic (Veldhuizen et al., 2006), since "companies are investing more in collecting and storing information rather than using information that they have already" (Rollins et al. 2012b, p. 985).

A gradual shift from an information-oriented vocabulary to a knowledge-based vocabulary has therefore been made in the management literature invigorated by the knowledge-based view, the literature on knowledge management and customer knowledge management.

It is in this context that "Knowledge Discovery from Data" (KDD), through its driving mechanism (data mining), has emerged as the solution that would make all (formal) information about customers available to companies in order to extract the knowledge.

This study proposes to review the foundations of KDD and the methods associated with it and to go through the paths it proposes to move from customer data to customer knowledge according to the specificities and requirements of each phase of the CRM cycle.

So, the question we are trying to answer is how to turn customer data and information into customer knowledge to better manage customer relationship, and were datamining is involved in this transformation process?

KNOWLEDGE DISCOVERY FROM DATA (KDD) OR DATAMINING?

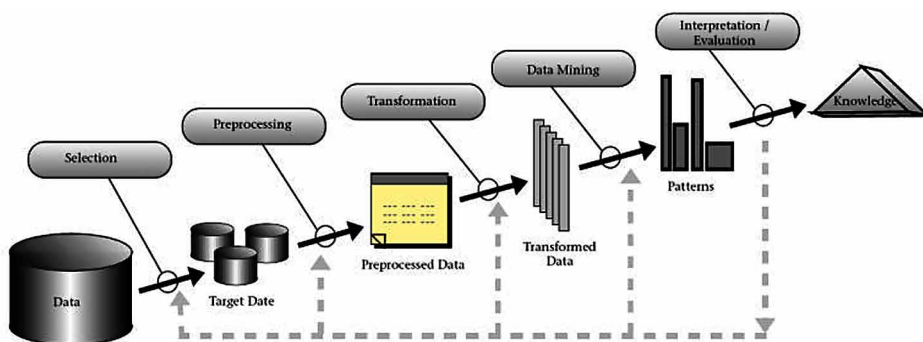
Several terms have been identified in the literature that refer to finding useful knowledge, or useful patterns in data. These are "discovery of knowledge", "archeology of data", "data processing", "data mining", etc. The term "knowledge discovery from data" remains the term most commonly used by a community of statisticians and database researchers (Fayyad et al., 1996, p. 28; Besse et al., 2001; Crié, 2003; Zighed and Rakotomalala, 2002). It denotes the whole process of discovering and revealing useful knowledge out of huge amounts of heterogeneous and protean data.

“KDD is a non-trivial process of identifying valid, new, usable and comprehensible patterns in data” (Fayyad et al., 1996, p. 30).

KDD, through its driving mechanism, data mining, is viewed as an engineering procedure to extract knowledge from data (Sedighi et al., 2012; Rakotomalala, 2002, p. 3; Fayyad et al. 1996 a, p. 28). This is a complex process (Figure 1) that functions through seven steps (Sedighi et al., 2012, p. 334; Zighed and Rakotomalala, 2002, p. 3; Fayyad et al., 1996a, p. 28).

Figure 1. KDD process

Source: Fayyad, Usama, Piatetsky-Shapiro, Gregory, & Smyth, Padhraic. (1996 b). From data mining to knowledge discovery in databases. AI magazine, 17(3), p. 41.



A first step in the KDD process is understanding the scope and objectives of KDD. The second step is selecting and understanding the variables. A third step is preprocessing data, which involves data preparation techniques (cleaning, integration, transformation and data reduction).

The fourth step is an Exploratory Data Analysis (EDA) stage in which statistical techniques are typically used to explore the data. The fifth step is data mining, which is the essential step in the process where intelligent methods are applied to extract structural features (patterns). The step of interpreting these structural features (models and data structure) comes next. This step can include an assessment of the models (in terms of validity and intelligibility) and a visualization of the results. A final step is obviously the use of the results or in other words, the use of knowledge extracted from the system in question.

Data mining, which remains the key step in the KDD process, mainly refers to the processing of structured data in the form of digital tables called datamarts (Zighed and Rakotomalala 2003, p. 5). It presents itself as an assembly of statistical, artificial intelligence, machine learning, data visualization, and high performance computing techniques or methods (Besse et al., 2001, p. 8).

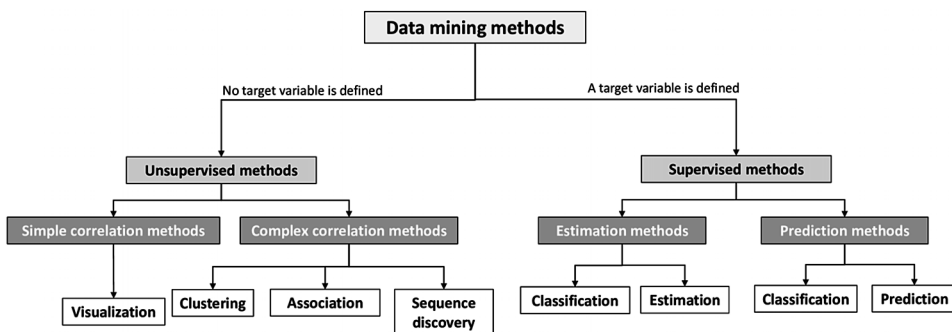
Data mining is not intended for only processing structured data in the form of numerical tables, it offers on the contrary a means to address textual data, images (image mining), sounds (sound mining) or videos and in this case, we speak more generally of multimedia mining (Zighed and Rakotomalala 2003, p. 3).

Functionally, KDD techniques make it possible to suggest, from the data, new perspectives, through summaries, complex association rules across data, combinations, groups of similar data in identifiable categories, and forecasts of future values (Abidi and Yu-N, 2000).

Whatever the term used, Knowledge Extraction from Data methods (Cri , 2003), data mining modeling (Sedighi et al., 2012), data mining algorithms (Wang and Wang, 2008), data mining tasks (Shaw et al. 2001), data mining models (Tsipstis and Chorianopoulos, 2011), data mining techniques (Besse et al., 2001), different typologies have been identified in the literature.

Referring to these different authors, we distinguish between unsupervised and supervised methods. In unsupervised methods, a distinction is made between simple correlation methods (description, visualization) and complex correlation methods (classification methods, association, and sequence discovery). For supervised methods, we will distinguish between explanation and estimation methods and predictive methods. The classification we use for KDD methods is shown in Figure 2.

Figure 2. KDD methods



In KDD unsupervised methods, no target variable is defined. These unsupervised methods are sometimes also called descriptive methods (Cri e 2003, Tsipstis and Chorianopoulos 2011).

The purpose of simple correlation methods is to describe the links between data and to visualize them in order to allow the user to have a synthetic understanding of all data (Zighed et al. 2003). Complex correlations seek to bring out similarities between data through clustering¹, association², and sequence discovery³ methods.

Unsupervised methods, including estimation⁴ and predictive⁵ methods, make it possible to link a phenomenon to an explanatory phenomenon.

Classification is one of the most studied predictive methods in data mining. Its aim is to construct a model to predict future behavior by classifying units into predefined classes, according to certain criteria (Sedighi 2012, p. 334, Ngai et al., 2009, p. 2594, Tsipis and Chorianopoulos 2011, p. 18). Ranking generates models that can be used as a scoring system for new entities.

KDD: ARE WE REALLY SPEAKING ABOUT KNOWLEDGE?

The definition retained in this chapter for KDD presents it as a process of extracting or discovering knowledge in large amounts of data. However, what is meant here by “knowledge” and what is meant by “data”?

KDD: A “Positivist” Approach to an “Explicit” Knowledge

If there is a consensus about the notion of data, such a consensus on the notion of knowledge is still lagging behind.

Simply, data is a fact (Banasiewicz, 2013, p. 93), it is acquired instrumentally and is not necessarily intentional. It is discrete, unitary and known to be objective (Prax and Sérieyx, 2000). It results from acquisition or measurement. It represents neither an intention nor a project. Data is raw and has no meaning in itself (Pesqueux and Durand, 2004, p. 29).

However, the notion of knowledge is widely recognized as a broad, complex, polysemous and abstract notion. In general, the debate on the nature of knowledge has been fueled by three distinct epistemological currents: positivism, interpretivism, and constructivism. The discord about the definition of knowledge relates to the search for “truth” which remains the unique purpose of knowledge (Pesqueux and Durand, 2004, p. 13).

For positivists, reality exists in itself, it has its own essence. There is therefore an independence between this reality (the object) and the one who observes or experiences it (the subject).

This independence allowed positivists to establish the objectivity’ principle of knowledge and its independence from the researcher’s belief (Pooper 1991, p. 1991, in Thiétart 2003, p. 17). Knowledge is also acontextual because it is sensitive to updating the laws of an immutable reality. This updating is external to individuals and independent of the context of the interactions of them (Le Moigne, 1995, p. 23).

This view of knowledge joins the notion of “explicit” knowledge identified by Polany (1967), which is knowledge that results from an objective appreciation of reality.

This explicit, codified, formal knowledge can be expressed in words, numbers, diagrams and can be shared by information systems. It results from a voluntary codification process that agents use to communicate and consistently preserve (Rollins and Halinen, 2005, p. 2).

According to the rival, interpretivism and constructivism paradigms, the status of reality is more precarious. Contrary to the positivist vision, under these paradigms, reality remains unknowable in its essence since the possibility of reaching it directly is thin or nil.

For radical constructivists, this reality does not exist and they speak of “invention” or “construction” of reality. The most moderate constructivists and interpretivists leave this question open but insist on the fact that this reality (whether it exists in itself or not) will never be independent of the mind and the consciousness of the one who observes or experiments it. Reality depends on the observer (the subject).

This led constructivists (radicals and moderates) and interpretivists to consider that there is no objective knowledge of reality. We can only imagine it (for the interpretivists) or construct it (for the constructivists).

Knowledge is thus subjective and contextual. The process of creating knowledge therefore involves understanding the meaning that actors give to reality.

In other words, knowledge is basically tacit (according to Polany’s 1967 classification). It is unique to the individual or the group and cannot be explicitly described. Knowledge resides in the skills, expertise and practices of individuals and organizations. It is informal, produced through individual experiences, intuitions, minds, beliefs and behaviors (Rollins and Halinen, 2005, p. 2).

Thus, after briefly reviewing the epistemological approaches to knowledge, we can conclude that KDD is a concept rooted in a positivist approach to knowledge. Knowledge is objective. It results from the models (patterns) constructed. It is an update of the laws of a reality considered immutable, external to the individual or the group and independent of the context of the interaction. It is fundamentally explicit, formal, and codifiable knowledge.

KDD in Organization: A Representationalist Approach to Organizational Knowledge

The use of data mining methods in organizations also raises the question of which approach to organizational knowledge is adopted.

Benefiting from the epistemological debate on the concept of knowledge, the concept of organizational knowledge has been strongly influenced by different

paradigmatic approaches, mainly the positivist paradigm and the constructivist paradigm.

Two conceptions of organizational knowledge dominate the managerial literature (Von Krogh and Roos, 1996; Grimand, 2006). The first is called “representationalist” western epistemology, which shares many similarities with positivism. The second, “anti-representationalist”, of eastern origin, is more akin to a constructivist view.

Representationalist View of Organisational Knowledge

This representationalist view of organizational knowledge implies that it is a durable raw material that can be stored. This is the basis of an informational theory of organizational knowledge. Organizational knowledge would somehow emerge from information systems.

Knowledge is considered as a pre-existing reality, treated as an object liable to lose or gain its substance, and it can be quantified, extracted, codified and archived (Grimand, 2006, p. 143).

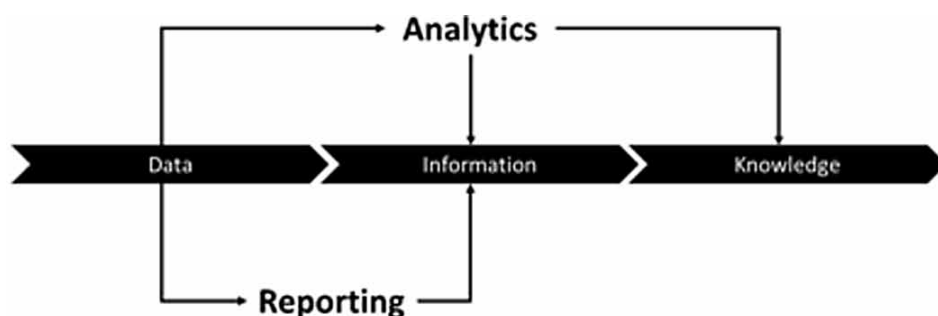
Dissociating knowledge from its use, as well as the desire to reduce the organization’s dependence on individuals, means that knowledge and information tend to be intertwined in the same register and the distinction between the two becomes difficult (Pesqueux, 2005, p. 14).

Banasiewicz (2013), who we qualify as a representationist, is one of the rare authors to have clearly distinguished information from knowledge. The author (2013, p. 95) distinguishes organizational information from organizational knowledge referring to the distinction between “reporting” and “analytics”.

For the author, data is converted into information following a reporting process and data is converted into knowledge following an analytical process (Figure 3).

Figure 3. Data value-added progression

Banasiewicz, Andrew D. (2013). Marketing Database Analytics: Transforming Data for Competitive Advantage: Routledge, p. 95



According to the author, reporting is the process of converting data into information. It mainly bears on a numerical and graphical syntheses of data with a mainly descriptive objective (Banasiewicz 2013, p.95).

Beyond the “status quo” of reporting, a more robust set of analytical processes can turn separate pieces of data and information into high-level inferences: knowledge.

The ultimate goal of this analytical process is the search for extrapolation and prediction. In other words, analytics looks for causal explanations and predictions that could support decision-making.

In this regard, reports offer descriptive summaries of past events: this is called information. Analytics supports the probabilistic interpretation of data: at this level we speak about knowledge (Banasiewicz 2013 p. 98).

To establish a connection with what we said previously about KDD methods, when the methods employed are unsupervised, we are talking about information. We transform data into knowledge the instant we use supervised methods.

Anti-Representationalist View of Organisational Knowledge

The second approach, the anti-representationalist, is extracted from the writings of authors such as Nonaka (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka et al., 2000), Tsuchiya (1993), Prax and Sérieyx (2000), etc.

This view focuses more on the management of the factors of knowledge creation process and criticizes the dehumanized and static nature of the first view which, according to these authors, would not allow for apprehending the human and dynamic dimensions of organizational knowledge.

In general, anti-representationalists do not see knowledge outside the human, they consider it to be tacit.

Although they adopt the distinction between explicit knowledge and tacit knowledge, they consider that the original source of organizational knowledge is individuals’ tacit knowledge (which may or may not be “explicited”).

This distinction between tacit knowledge and explicit knowledge would be essential to explain the cognitive dynamics of the organization (as in the SCEI model of Nonaka I.).

Even if they recognize that (explicit) knowledge can exist outside of the human or the group, these authors imply the superiority of implicit knowledge over explicit knowledge (Prax and Sérieyx, 2000; Tsuchiya 1993; Grundstein, 2003).

Therefore, to our belief, we consider that the KDD process applied to organizations is embedded in a fundamentally representationalist approach to organizational knowledge. It deals with explicit, codified and formal knowledge, which mainly emerges from information systems and databases.

KDD tends to use tools that focus on information processing capabilities. The objective is to develop more relevant representations and models of the environment.

From Customer Data to Customer Information and Customer Knowledge

The complexity in defining the concept of knowledge came along an ambiguity in defining “customer knowledge”. This ambiguity can be felt in the confusing interchangeability between the notions of “customer data”, “customer information” and “customer knowledge” in the marketing literature (Roy and Stavropoulos, 2007, p. 17).

Likewise, if there is a consensus around the notion of customer data, there is no such consensus on the concept of customer knowledge.

For Rollins et al. (2005), customer data is simply a fact about customers in databases and in the minds of employees.

We like to emphasize, however, at this level, that in KDD, the data from which knowledge will be extracted are structured data (recorded on a digital device).

Unstructured data, which is of human origin, is treated by more oral, relational and intangible processes than textual (Coelho, 2001). This type of data is generally possessed by front desk personnel (Rollins et al. 2005) and fall outside the scope of KDD.

The definitions of “customer knowledge”, like “organizational knowledge” are often shared between the representationalist approach and an anti-representationalist approaches. Our review of the Customer Knowledge Management literature allows us to suggest that definitions rooted in the anti-representationalist approach remain the most dominant.

Accordingly, customer knowledge is seen to be the result of the “dissemination of information” in the organization, and its “appropriation” or its “internalization” by individuals (Rollins and Haninen, 2005, p. 3; Sun 2010, p. 40; Khliliabad et al. 2006, p. 10; Campbell A. 2003, p. 376).

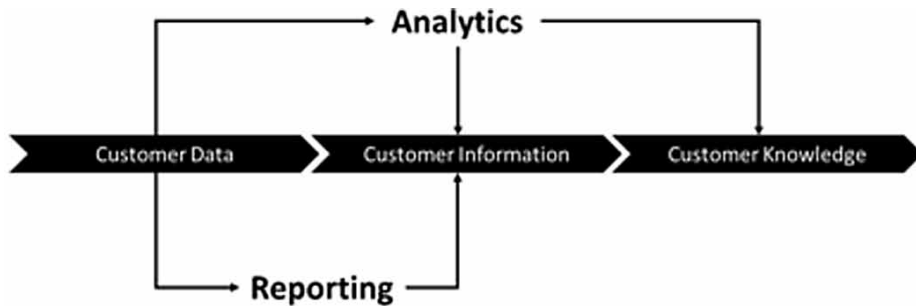
Although, it still seems very difficult to define the concept of customer knowledge according to a single standard, we adopt at this level a representationalist approach to customer knowledge and propose that customer knowledge is understanding customer behavior and needs (Alhawari et al. 2008, p. 28). As this understanding is pre-existing and independent of the knowing subject, customer knowledge is therefore objective, explicit and formal. It is knowledge that can be extracted through the application of information and communication technologies such as data mining techniques.

Customer information results from a mainly synthetic processing of customer data for a mainly descriptive purpose. From the moment we use analytical extrapolation

and prediction processes, customer data or information will be transformed into customer knowledge (Figure 4).

Figure 4. Customer data/customer information/customer knowledge

Adapted from Banasiewewicz, Andrew D. (2013). Marketing Database Analytics: Transforming Data for Competitive Advantage: Routledge, p. 95



WICH STEPS FOR CUSTOMER RELATIONSHIP MANAGEMENT?

If for KDD there is an agreement on its definition, for Customer Relationship Management (CRM), several debates and controversies in the management literature are still relevant.

Bearing on a philosophy and a strategic framework of incommutable line of thinking, which is relationship marketing (Zablah et al., 2004), CRM has been the subject of several conceptualizations, but it remains particularly difficult to find concurrent definitions for CRM in the literature (Coovi B. 2010).

In a synthesis and analysis of the different conceptualizations of CRM proposed in the literature⁶, Zablah et al. (2004) categorized the various CRM definitions into five broad perspectives: CRM as a process, CRM as a strategy, CRM as a philosophy, CRM as a set of capabilities and CRM as a technology.

The technology approach is one of the predominant approaches to CRM, since simply, the term CRM first emerged in the 1990s and referred to “customer solutions”-based technology (Payne and Frow 2005 and Ngai 2005).

For many authors, including Crosby (2002), CRM cannot be restricted to its own technology but to the whole strategy of the company. However, the author highlights the importance of this technology as an enabler of customer relationship management under a strategic vision.

The CRM’s process approach is also a “popular” approach in the marketing literature, perhaps because it is rooted in the “relational” logic that is simply the

ancestor. This “process” approach of customer relationship management finds its foundation in the concept of “relationship management” in general, which is often described in terms of phases.

Dwyer et al. (1987) identify five phases for relationship management: awareness, exploration, expansion, engagement and dissolution.

Diller (1995) also identifies five phases of the relationship management namely: preparation phase, initiation phase, penetration phase, maturity phase, stagnation phase and dissolution phase.

Applied to the customer context, management of the relationship has given rise to CRM cycle or process, which also functions in a set of phases.

The CRM process refers to a set of tasks or activities that together achieve a desired result in customer relationship management. Because task groups can be subdivided or grouped into sub-processes, the specific nature of a process depends on the level of aggregation used to define it (Zablah et al., 2004, p. 476).

If there is a consensus about some phases of the CRM cycle, namely the retention and the development phase, such a consensus on other phases is still lagging behind.

The wording of the phases and their dimensions would, in our opinion, require more explanation.

For example, Tsai et al. (2011, p. 427) focus on two phases of the CRM cycle, namely a customer acquisition phase (gaining customers) and a customer retention phase (keeping customers).

For other authors, three phases are distinguished in the CRM cycle (but which are not always the same). Swift R.S. (2001, p. 45) distinguishes customer retention, acquisition and profitability phases. The author defines customer retention as the ability of the business to retain profitable customers. Customer acquisition is the ability of companies to acquire the right customers (based on known characteristics) that promise growth and increased margins. Finally, customer profitability is the ability of companies to increase the margins of each customer while offering the right products at the right time.

For Reinartz et al. (2004, p. 294), three phases are identified for CRM: an initiation phase, a retention phase and a termination phase. Reiman et al. (2010) took up these same dimensions. Peelen Ed et al. (2009) also identify three phases for CRM. These are the recruitment, retention and development phases. Reimer et al. (2011) retain an initiation phase, an expansion phase and a termination phase.

The number of phases increases with Kracklauer et al. (2003) who propose four. These phases were taken up by several other authors (including Ngai et al., 2009, and Veglio, 2013). These are namely: Customer Identification, Customer Attraction, Customer Retention and Customer Development.

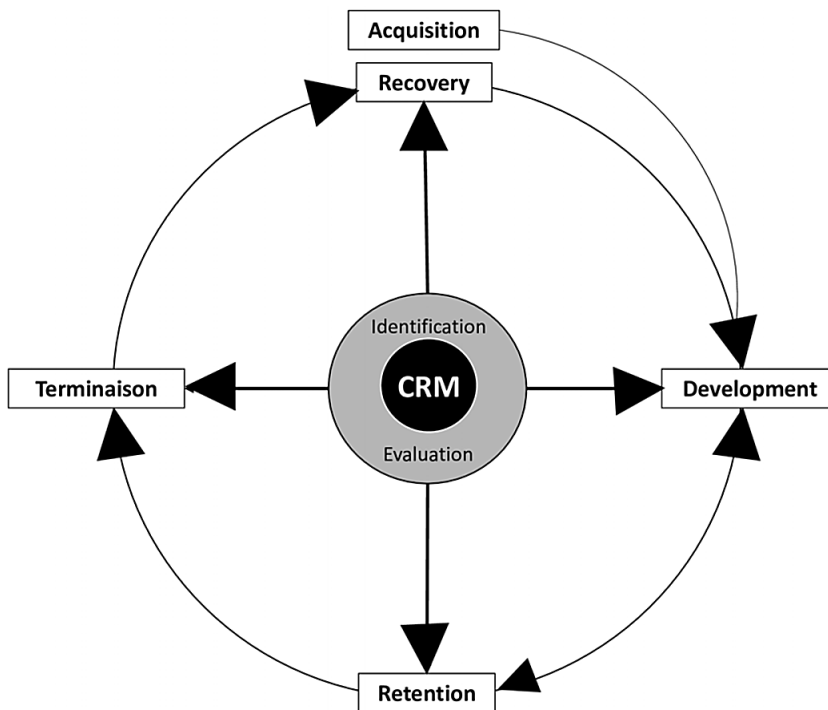
The four phases increased to five with Mirzaei and Lakshmi (2014), who, with reference to Swift (2001) and Parvatiyar and Shet (2001), identify an acquisition phase, an attraction phase, retention, development and customer equity growth.

In line with the above literature, and mainly the research of Reinartz et al. (2004) and Kracklauer et al. (2003), we propose to retain seven phases for CRM, namely the identification phase, the customer evaluation phase, the acquisition phase, the re-acquisition phase, the retention phase, the development phase and the termination phase. We schematize the selected phases in Figure 5 below.

The first two phases, namely the identification and the customer evaluation phases, both of which are interdependent phases, are considered as central phases of CRM because they precede the five others.

The other five phases are more action-oriented. These are the acquisition phase, the re-acquisition phase, the retention phase, the development phase and the termination phase.

Figure 5. CRM process phases



DATA MINING TASKS FOR CUSTOMER RELATIONSHIP MANAGEMENT PHASES

Considering the seven phases that we retain for the CRM cycle, and referring to Fayadd's definition of KDD (1996), we will identify in what follows the areas of application of data mining for CRM. These areas cover the identification and evaluation of customers, acquisition of new customers, re-acquisition of lost customers, retention and development of the relationship with customers and termination of the relationship with unprofitable customers.

Data Mining at the Service of Customer Identification

The identification phase that we use here as the central phase of CRM is strongly inspired by the identification phase of Kracklawer et al. (2004) and later taken by Ngai et al (2009). According to these authors, customer relationship management systematically begins with this phase (identification phase), i.e., a phase of defining target customer groups and collecting data on these groups (qualitative and quantitative data). These authors introduce in this phase, beyond the targeting of the most profitable segments, the analysis of lost customers (with the aim of regaining them) (Kracklawer et al., 2004, p. 4). We thus consider, and in line with Kracklawer et al. (2004) and Ngai et al. (2009), that the identification phase is a phase in which customer relationship managers identify and describe the different types of customers and prospects. However, and differently with these authors, we consider that the re-acquisition dimension should be addressed in a separate phase.

Segmentation and profiling of the identified segments emerges from our literature review as the most important application of data mining for customer identification (Kracklawer et al., 2004, Ngai et al., 2009). It should be noted here that the type of segmentation referred to here is "tactical segmentation" in the words of Peelen et al. (2009, p. 156) or list segmentation according to Verhoef et al. (2003). This type of segmentation only refers to the identified customers and prospects, i.e., on whom the company holds a set of structured data (in a database).

The segmentation of the database seems as an inevitable precondition before any actions of acquisition, retention, development or termination of the customer relationship. It is an essential intermediate step to determine the most important differentiating factors for customers and to decide which customers to put more resources on and to prioritize marketing investments (Peelen 2009, p. 156; Sausen et al., 2005, p. 157; Lefébure and Venturi 2004, p. 115).

Thanks to the increase in the range of data available on customers, segmentation of identified customers and prospects is developing and exceeding the traditional constraints of accessibility, substantiality and measurement of segmentation (Lefébure

and Venturi 2004, p. 116; Wedel and Kamakura 2000, p. 3). According to the methodological approaches to segmentation proposed by Aurier (1989), Goller et al. (2002) and Hiziroglu (2013), the segmentation process of customers and prospects into a database consists of a set of steps namely: definition of segmentation objectives and objects, choice of segmentation criteria, choice of segmentation models and techniques, segment identification, segment description or profiling and control. Profiling segments is particularly important if decision maker wants to implement a marketing action on one or more segments. This profiling allows the description of these segments based on operational variables.

The KDD's method applied in this phase is clustering. Clustering, as mentioned previously, is an unsupervised or descriptive method, involving complex correlation. Clustering gathers data into groups of similar objects to form homogeneous subgroups (clusters, classes). Within groups, the data are similar to each other and are different from other groups (Sedighi et al 2012, Ngai et al., 2009).

Data Mining at the Service of Customer Evaluation

Investing more on some customers and less on others is a relational strategy accepted by most companies. All decisions about the acquisition, re-acquisition, development, retention and termination of customer relationship should base themselves, among other things, on customer assessment (Reinartz et al. 2004). Mirzai and Iyer (2014) refer to this notion of customer evaluation in one of the dimensions they adopt for CRM, namely "Customer equity growth".

For these authors, this dimension ensures a steady growth of the value of customer transactions in terms of future revenues and long-term profitability. According to these authors, the elements of this dimension would be customer profitability and customer lifetime value (CLV). Customer profitability assessment and forecasting is important for the entire CRM process (acquisition, expansion and termination) and particularly for the termination phase (Kracklawer, 2003, p. 6, Reimen et al., 2011).

Like Reinartz et al. (2004), who introduced "customer evaluation" as the first sub-dimension in all phases of CRM they identified (initiation, maintenance, termination), we consider the evaluation phase of customer value, and likewise the identification phase, as central phases in the CRM process since it involves acquisition, re-acquisition, development, retention and termination decisions.

Several criteria for evaluating profitability and customer value have been identified in the literature, the most frequent of which are turnover⁷, RFM⁸ score and CLV.

In this phase of customer evaluation, data mining, applied to the given customer, makes it easier to calculate their scores and especially the predictive ones such as CLV.

Customer Life Time Value (CLV) is a predictive score that identifies customers with higher potential value (in order to take appropriate actions) but also customers

for whom the value is negative and for which raises the question of their possible rejection (termination phase) (Peelen et al., 2009, p. 146).

CLV is defined as the present value of future cash flow (Reimer et al., 2011). More specifically, this value represents the discounted margin flow that the customer generates during the duration of their relationship with the company. This CLV is the difference between the discounted revenue streams and the investment flows needed to recruit and maintain the relationship with a customer.

Although the computing methods differ from one author to another, the challenges of forecasting CLV remain forecasting future sales and costs, the estimation of customer lifetime value, the choice of a discount rate of future flows and the integration of non-economic dimensions (Reimer et al., 2011, Peelen Ed et al., 2009).

Data Mining at the Service of New Customer Acquisition

Although there is a duality opposing new customers acquisition and existing customers retention and despite agreement on the importance of loyalty, the new customers acquisition phase, also called recruitment phase (Peelen et al., 2009), remains of major importance. A business can make significant gains by investing in acquiring new customers (Ang and Buttle 2006).

No company dismisses setting up a new customer acquisition process, simply because it is almost impossible to keep 100% of customers from one year to the next. Even firms with a high retention rate are concerned with the issue of acquiring new customers (Peelen et al., 2009, p. 185).

The issue of customer acquisition is highly pressing simply because some customers have little time, energy or interest to establish a long-term relationship with a company, or because they simply seek to satisfy a need rather than continuity. Customers are referred to as “brand switchers” or “portfolio shoppers” according to Dowling (2002).

The issue of acquiring new customers may also arise in some particular contexts. This is an issue for start-ups, for companies that are tackling a new market, a new segment, or launching a new product. The acquisition issue also arises when the business explores new applications for an existing product, or when repeat purchases are infrequent (real estate market, child care, etc.) (Ang and Buttle, 2006, p. 298).

Several applications of data mining meeting the goal of recruitment of new customers have been examined in the literature. Examples include profiling the best clients, calculating the probability of prospects to become good customers, (Peelen et al., 2009, p.185), or the probability of acquiring prospects, also called conversion probability (Reimer et al., 2011).

An analysis of prospects' expectations (Peelen et al., p. 184), and an analysis of the online behavior of prospects (Reimer et al., 2011) can also be considered with a view to acquiring new customers.

Data Mining at the Service of Lost Customer Recovery

The phase of recovery phase of lost customers, also called re-acquisition, "customer regain", "customer winback", is a phase that has been neglected in the CRM literature. The re-acquisition phase has been defined as the process of resuscitating relationships with profitable customers who have broken off their relationship with the company (Thomas et al., 2004, p. 31; Helfert and Hermann, 2003, p. 101).

In the CRM literature, the re-acquisition phase of lost customers has often been associated with the acquisition phase of new customer to constitute together the two sub-processes of a generic phase called the initiation phase (Reinartz et al. 2004, p. 295). In other studies, the re-acquisition phase of lost customers has been linked to the retention phase because of the very thin line between inactive and lost customers. Re-initiating the relationship with profitable customers needs detecting "lost" customers and identifying the ones that are profitable. Then, actions to reacquire them can be undertaken.

According to Helfert and Hermann (2003, p. 102) and Peelen (2009, p. 186), for the re-acquisition of lost customers as for the retention of inactive customers, it is necessary to define beforehand what is a lost customer. This involves identifying the boundary between inactive and lost customers. What time base to retain? Can we talk about defection when the customer does not buy anymore for six months for example? Should we rely on the total absence of a transaction? The answer to these questions is most delicate because a lost customer may have expressed their defection directly (external termination), as they can discontinue the relationship with the company without expressing themselves explicitly (internal termination).

In contractual relationships (banking, insurance, telecommunication ...), it is relatively easy to identify lost customers since these relationships are based on formal commitments and customers are required to express their defection explicitly. In other cases, where the customer can disengage with the company without having to express it explicitly, it is much more difficult to identify customers who have left and to distinguish them from inactive customers. In this case, mechanisms for detecting defection should be identified.

Peelen et al. (2009, p. 186) recommend conducting descriptive analyzes of initiation processes. Some applications of data mining are identified in the literature as being able to meet this objective of re-initiating the relationship with lost customers. These are all the applications that detect the customer's status (lost or inactive), evaluate their profitability or value, and predict the likelihood of re-acquisition.

Data Mining at the Service of Customer Retention

Profitable customers' retention is one of the main focus of CRM (Ang and Buttle, 2006, p. 296).

It includes all the approaches necessary to customer loyalty (Kracklauer et al., 2003), but also to their satisfaction and churn management (Mirzeai et al., 2014).

Customer Satisfaction

The main goal of a retention phase is customer satisfaction. Several different definitions of customer satisfaction can be found in the literature but the most accepted definition is that which presents satisfaction as a judgment made by the consumer about an offer (a product or a service), a judgment adopted according to their expectations. In other words, the consumer compares what he/she perceives with a standard, a pre-consumer standard: his/her expectations.

In general, two different approaches to customer satisfaction are distinguished: a transaction-specific approach and a cumulative approach (Boulding et al., 1993).

From a transaction perspective, customer satisfaction is seen as an evaluative judgment after a choice, after a specific purchase opportunity, an affective reaction (Oliver et al., 1981 and Oliver 1993). In contrast, cumulative satisfaction is considered as an aggregate assessment that considers a set of purchases or consumption experiences of a product or service over time (Anderson et al., 1994, p. 54).

Customer Loyalty Program

A second goal in a retention phase is loyalty program. A loyalty program is the approach taken by a company to create lasting relationships with its customers while customer loyalty is generally defined as the intention to create and maintain a long-term relationship with the company (Wang et al., 2004).

As for satisfaction, two approaches to the concept of loyalty coexist. A behavioral or stochastic approach and an attitudinal or psychological approach. In the first, loyalty is considered a behavior: a customer is considered loyal if he/she buys the same product or brand regularly during a period of time.

Based on a critique of the behavioral approach that is considered "misleading" as it could be based on convenience and substitution costs, the attitudinal approach sees loyalty as a favorable attitude towards a provider, a brand, a company, and this following several buying experiences (Wang et al., 2004, p. 173).

Churn Management

The other interest of the retention phase is the “churn management”. The term “churn” refers to the reverse phenomenon of retention. It qualifies the starting process of customers at an aggregate level. To qualify the departure of an individual, we speak rather of defection. (Peelen 2009, p. 186).

Churn management mainly manifests itself by the calculation of a “churn score”, which makes it possible to evaluate “the probability that a customer leaves the company”. Such a score allows the decision-maker to identify customers who are at high risk (of leaving) and offer them customized retention actions (adaptation of offers, provision of supplementary services, assistance, etc.) (Neslin et al., 2006).

Our literature review has allowed us to identify a set of data mining applications that fit perfectly into the customer retention phase. These include initiation process analysis, profiling of departing customers, analysis of levels and reasons behind satisfaction and dissatisfaction, detection of active or inactive customers, and complaints analysis (Peelen et al., 2009). Here, text mining is one of the approaches of data mining that automates the analysis and processing of complaints generally collected in a text form.

The churn score is one of the most known data mining applications. As for all the predictive methods, the computation of the churn score requires the passage on the one hand, from an inductive phase consisting of developing the rules of identification, starting from particular examples (explanatory methods) and on the other hand, by a “predictive” phase aimed at using these rules to identify new instances.

Data Mining at the Service of Customer Relationship Development

The stakes of retention and development are partly linked since the development of the relationship contributes to lengthening it (Peelen et al., 2009, p. 192). It is for this reason that the development and retention phases are often associated under the same label: maintenance phase (Reinartz et al., 2004) or expansion phase (Peelen et al., 2009, Reimer et al., 2011).

In a development phase, the goal is to expand transaction intensity, transaction value, and profitability of existing customers. This is done by taking the customer to purchase other products and services, by acting on the frequency and volume of purchase and by acting on the type and value of purchased products (Kracklawer 2003, Ngai et al., 2009, Reimer et al., 2011).

The implementation of development actions usually raises two questions: which customers should be solicited and which products or services to offer them. These two questions are so intertwined that they are treated together. Indeed, the choice of a

customer depends completely on the nature of the offer and vice versa (Peelen 2009). Implementing a development action necessarily implies actions on the quantities purchased, purchase frequency, range level, the cross-selling and the up-selling.

Cross-selling is a form of additional sale that involves a product or a service of a different category than the one that motivated the original purchase. Up-selling is also a form of additional sale that offers a more expensive and sophisticated product or service but from the same category of the product or service that motivated the original purchase (Peelen et al. 2009, Reimer et al., 2011).

The applications of data mining in a development phase revolve mainly around cross-selling, up-selling and calculation of associated propensity scores. The goal of propensity scores is to identify the customers most likely to respond positively to an additional sale (up-selling or cross-selling). In other words, it is a question of calculating the probability of the customer to respond positively to the offer, i.e., their propensity to respond positively to an additional sales action (Peelen, 2009, p. 194).

The calculation of these scores fits into the classification category of data mining methods (Tsiptsis et al., 2009). Analyzes of purchasing associations, affinity analyzes and the analysis of delays between two purchases are also data mining applications aimed at developing the relationship (Peelen et al., 2009, p. 199).

According to the authors, purchasing association analyzes identify the most common associations between different categories of products and services, and affinity analyzes highlight the affinities between a product category and a customer segment. Finally, the analysis of the delays between two purchases makes it possible to determine the time that should be allowed before launching an up or cross selling campaign. Other types of data mining applications may include multi-channel purchasing behavior in order to predict the number of channels that customers use, the time it takes a customer to adopt a new channel, and the criteria for selecting the different channels (Reiman et al., 2011).

Data Mining at the Service of Customer Relationship Termination

The least addressed phase in the CRM literature remains this termination phase of the relationship (Reinartz et al., 2004, Reimer et al. 2011). In a relationship-termination phase, the goal is to identify inactive customers or customers with a high risk of defection and determine which of these are profitable for the company and which are no longer to decide with which customers the relationship should continue (and generate retention actions) and with which others this relationship should be discontinued (Reimer 2011). In other words, the company will decide to stop generating costs incurred on customers identified and described as unprofitable or low value.

Customer evaluation (in terms of profitability and value), which is critical for all CRM phases, is particularly important in this CRM phase.

Here again, CLV is the most quoted criterion of customers' evaluation in the literature because it allows for identifying customers whose profitability level decreases total profit and for whom the question of possible termination is considered, and the option for a selective reduction of investments may be outlined (Peelen et al., 2009, p. 146).

CONCLUSION

Appropriate data mining methods and techniques, ranging from simple descriptive analysis to complex predictive score calculation, can extract and discover knowledge about customers. Such knowledge about customer behavior and characteristics can provide a solid foundation for the development of a relationship strategy (Ngai, 2009 and Mirzai, 2014). Data-extracted customer knowledge can be used to meet specific CRM objectives such as customer identification and evaluation, acquisition of new customers, re-acquisition of lost customers, retention and development of relationships with customers as well as the termination of the relationship with unprofitable ones.

When KDD methods employed are unsupervised, offering descriptive summaries of past events, customer information is extracted. We transform customer data into customer knowledge the instant we use supervised methods that support the probabilistic interpretation of data.

The implementation of a process of extracting knowledge from data inevitably refers to the use of analytical technologies. These technologies, generally associated with analytics in general and analytical CRM in particular, are data structuring technologies (databases, datamarts and data warehouses) and data mining technologies (Buttle and Iriana 2006, Greenberg 2004 in Mosadegh and Behboudi, 2011).

However, it is inconceivable to claim that analytic technologies alone can generate superior performance. The knowledge, skills and experiences that enable employees to convert data into knowledge are critical to achieving better results. These are analytical skills.

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ENDNOTES

- ¹ Clustering groups data into groups of similar objects, segments them together to form homogeneous subgroups (clusters, classes). Within groups the data are similar to each other and, by definition, different from other groups (Sedighi et al 2012, Ngai et al., 2009).
- ² Associations make it possible to detect associations between events, products, attributes (Ngai et al., 2009, Sedighi et al., 2012 and Tsiptsis K. et al., 2011).
- ³ Sequence discovery, or Sequence models, can detect associations over time (Ngai et al., 2009, Tsiptsis K et al., 2009).
- ⁴ Estimation methods consist in defining the link between a set of determinants and a target variable from “complete” data. Depending on the nature of the variable to be explained (categorical or numerical), we speak of classification or estimation method.
- ⁵ In predictive methods we try to define the link between a set of independent variables and a target variable from “incomplete” data. In this type of method, there is on the one hand an “inductive” phase consisting in developing the identification rules based on particular examples (present) and on the other hand, a “predictive” phase aiming to use these rules to identify new instances. Always according to the nature of the variable to be explained (categorical or numerical), one speaks of method of classification (classification and propensity models) or prediction (prediction).
- ⁶ See for example the summary of Payne and Frow (2005).
- ⁷ The turnover achieved by the customer is the simplest criterion which is inspired by the law of 20/80 Pareto. According to this law, and in most cases, 20% of the best customers can generate approximately 80% of the turnover (Lefebvre and Venturi 2005, p 116).
- ⁸ The RFM score is based on the three variables: recency (the date of the last purchase), frequency (the number of times the customer has made purchases during a period of time), and Monetary (accumulated value amount). If we use not the total monetary value (M) but rather the average amount per transaction (Average), we speak instead of RFA. (Peelen et al., 2009, 172).


Chapter 9

Deep Learning Approach for Detecting Customer Churn in Telecommunication Industry

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ABSTRACT

In today's business world, customer turnover is a significant problem. Communications companies aren't exempt from these problems. Retaining consumers is more important than recruiting new ones when it comes to business. Getting new clients is about five times as expensive as keeping old ones in this field. As a result, anticipating client turnover is a huge challenge for almost all organizations. This study focused on analyzing information on around 7000 post-paid subscribers by considering 21 different attributes. Initially, the data was fed into machine learning techniques such as k-nearest neighbors, artificial neural networks, etc. In addition, deep neural networks (DNN) have also considered more than one hidden layer. A total of 4284 of the 7234 post-paid customers are considered non-churners, while the remaining 2950 are churners. The long short-term memory networks (LSTM) considered under the DNN produce results far superior to the other techniques, with the highest accuracy rate of 82.46%. Finally, the LSTM method was used to create the final prediction model.

DOI: 10.4018/978-1-7998-9553-4.ch009

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INTRODUCTION

Clients are a firm's most precious asset. It must retain a solid client base while being competitive as the firm invests in its customers. If not, clients will quit (churn) the existing firms or service providers. The company's reputation and economic sustainability may be compromised as a result. "Customer Churn" means removing a consumer commitment or a business line (supporter, user, subscriber, etc.). For instance, when a client is a frequent client of "A" businesses, the service provider switches to "B" businesses (Amin et al., 2017; Olle & Cai, 2014). Customer happiness is crucial to the success of any organization. Customer churn or retention levels are key industry measurements used by banks, telecoms companies, airlines, Broadband providers, pay-TV companies, and insurance organizations. The churn rate is significant because it indicates how consumers respond to goods, prices, and competitors. To lower customer churn, the capacity to recognize churn content/ behaviors would allow early response procedures as part of retention efforts.

Churn estimation is crucial nowadays in the telecommunications sector. Its popularity has skyrocketed in recent years. The telecommunications industry has several service providers because of the need for effective contact. People have a limited number of service provider alternatives, and practically everyone has a telecom membership. Customer churn is common in this market since it is simple for subscribers to migrate to another service provider, including unsatisfied customers, switching costs, outstanding service consumption, and poor customer service (Sayed, Abdel-Fattah, & Kholief, 2018; Sharma, Panigrahi, & Kumar, 2013). Besides traditional theories, there are indeed emerging causes for client retention, such as unhappiness with the early interaction with the service provider and the difficulties achieving consumers' unrealistic expectations.

The industry adopts a variety of techniques to remain competitive. The business or organization may need to develop new valuation customer services retention initiatives to accomplish this. Paying members is much more valuable than acquiring a new customer (N. Lu, Lin, Lu, & Zhang, 2012). Obtaining new clients is more expensive, and therefore, it is desirable to keep present ones. The corporation strives to keep long-term consumers seeing as they are its cash cow. The company spends a large amount of money on customer churn estimates in maintaining customers. The following are the two major styles of churners: Churners are classified as either voluntary or involuntary. Voluntary churners (Active churners) voluntarily leave a supplier. The business faces a challenging challenge in identifying and predicting these possible churners. Passive churners (involuntary churners) are fired without their permission by a corporation or group. These churners are easily recognized and terminated for various reasons, including the subscription list's long-term failure to pay charges and fraud activities (Amin et al., 2019; Amin et al., 2017; Shaaban,

Helmy, Khedr, & Nasr, 2012). Accidental churners and intentional churners are the two types of voluntary churners. Here's a brief rundown of the churners as mentioned above.

1. Incidental Churn Customers

Customers who leave a service provider due to personal reasons such as a change in their financial status or a relocation.

2. Deliberate Churn Customers

This happens because of technological advancements. A change in service quality or psychological factors, such as a customer's preference for new technology.

We can design a customer churn prediction model and detect the most likely list of churners by conducting thorough research with the collected data from customers. This strategy will particularly aid us in identifying consumer attrition among those who are most likely to leave. These strategies may also assist the company in addressing the problem mentioned above by establishing a model for retaining future churners. As a result, it should go without saying that developing the above model will save time and money. In the telecommunications industry, several churn predictions models have already been developed. These models use a variety of algorithms, such as Decision trees, Regression models, Neural networks, Bayesian models, SVM, and so on (Ahmad, Jafar, & Aljoumaa, 2019). The general goal of this study is to create a new hybrid churn prediction model that employs a multi-layer methodology.

Integrating deep learning with neural networks to detect consensual churners and overcome challenges with existing designs, including predicting churners amid large amounts of customer information and discovering present customers. The churn behavior trend in forecasting churners implies churners and excessive wastage.

In most prior studies on the construction of churn prediction models, a single classifier technique was used rather than a combined one (hybrid one). These models were generated by comparing classic algorithms (Decision Tree, Support Vector Machine, etc.) to the dominant ones (XGBoost, AdaBoost). Additionally, it is readily apparent that only supervised learning approaches are used throughout the prediction model's construction in most such circumstances.

Purpose of the Study

Churn prediction is one of the scenarios discussed previously. It is critical for practically every industry. Telecommunications firms are not exempt from this

rule. Because attrition directly impacts the business's profitability, churn prediction enables the business to have a crystal-clear picture of future revenue. For example, lowering turnover by around 5% results in a 90% gain in profit (Sharma et al., 2013). As a result, an effective churn prediction tool is required to track and retain more valuable clients. According to the research findings, most prediction models were produced by adapting single classifiers and standard methods. However, some researchers have demonstrated that a prediction model constructed using a hybrid approach (two or more algorithms are combined) produces more accurate results than a model developed using single classifiers (N. Lu et al., 2012).

Several gaps and limitations in existing studies were discovered during the literature assessment. Most accessible models were constructed using traditional algorithms rather than the prevalent ones. The majority of past research on telecom churn prediction focused on determining which algorithms produce the most significant results in terms of accuracy. Additionally, the models were constructed by adjusting individual classifiers rather than combining them. Since meaningful decisions are made using deep learning and prediction analysis, developing new churn prediction systems or enhancing existing ones is a virtue. This research aims to present a novel hybrid methodology for analyzing data and effectively predicting churners by adapting supervised and unsupervised deep learning algorithms.

Additionally, while constructing a churn prediction model, it is necessary to gather information about churners and non-churners (target variable). However, collecting that data is not always practicable. Additionally, in most research, a prediction model cannot be used for the future, and the model does not account for the significance of features. A unique hybrid churn prediction model that employs both supervised and unsupervised machine learning techniques has been created to address the shortcomings mentioned above. The methodology enables the business to identify consumers who are more likely to churn in advance.

Churn estimations are crucial nowadays in the telecommunications sector. It's been progressively prevalent. The telecommunications sector features several service providers due to effective communication requirements. People these days have a limited number of active provider alternatives, and practically everybody has a telecommunications commitment. Customer churn is common in this market, including poor customer service, low switching rates, outstanding service usage, and easier for a subscriber to migrate to another service provider (N. Lu et al., 2012). The industry, therefore, uses several competitive strategies. The company or organization can develop new value-added services and retention strategies. Existing clients are much more important than acquiring new ones in the telecommunications industry. This study proposes a hybrid churn prediction model by acclimatizing deep learning to neural networks or machine learning to recognize consensual churners and address

specific models, including churners in large custodian data sets and difficulties in the know the current situation churn behavioral traits.

LITERATURE REVIEW AND RELATED WORKS

The term “customer churn” refers to the movement of customers from one service provider to another. Customer churn is a major concern for any organization, but the telecom industry is particularly concerned. The level of competition in South Asia’s telecom sector has risen significantly in recent years. Customers leave for various reasons, but unhappiness with the service, high subscription costs, and better alternatives are among the most common. To remain relevant in this market, telecommunications service providers work tirelessly. As a result, to keep up with the competition, they tend to focus on keeping current clients rather than attracting new ones. The telecom sector relies heavily on the ability to predict customer turnover. Predicting which consumers are at high risk of churn is critical to reducing customer turnover in the telecom industry.

Numerous studies have already been undertaken to identify consumers likely to churn. The telecommunications, banking, gambling, insurance, repair services, and gaming industries are currently concentrating their efforts on this issue. They must accomplish it by forecasting client attrition. Numerous churn prediction models have been developed by adopting various strategies, approaches, and algorithms in the telecommunications business. Thus, this chapter summarises the pertinent knowledge gained from research efforts and previous studies on constructing a client retention model.

The transfer of clients from one service supplier to the next is called “customer churn.” Customer churn is a significant concern for any organization, but the telecom industry is particularly concerned. The level of competition in South Asia’s telecom sector has risen significantly in recent years. Customers leave for various reasons, but unhappiness with the service, high subscription costs, and better alternatives are most common. To remain relevant in this market, telecommunications service providers work tirelessly. As a result, to keep up with the competition, they focus on keeping current clients rather than attracting new ones. The telecom sector relies heavily on the ability to predict customer turnover. Predicting which consumers are at high risk of churn is critical to reducing customer turnover in the telecom industry.

Sharma et al. (2013) have conducted a study on the turnover rate of prepaid telecommunications consumers using the Neural Network approach. This study outlined the variables that must be considered while developing an accurate and reliable churn prediction model. Twenty variables were evaluated, and an analysis of 2,427 clients constructed the model. Several considerations include the state, the

length of the account, the area code, and the total day minutes, among others. A randomly selected portion of the data set was trained to prevent exhaustion of the model. The model predicted churn with an accuracy of 92.35%. However, it had a drawback in performance and the additional time required to predict the results.

Shaaban et al. (2012) have conducted another comparative study using three data mining techniques, namely Decision tree, Neural Network, and SVM, to determine a feasible churn prediction method. Additionally, the simple K-Means technique was utilized for clustering. The churners that have been identified are classified into numerous clusters depending on variables such as profitability and unhappiness. Among the three approaches discussed above, SVM is the most accurate. While the SVM provided acceptable results, its accuracy is somewhat poor.

Keramati and Ardabili (2011) have created a hybrid model that combines ANN, K-NN, SVM, and Decision tree techniques. The suggested model produces churn prediction results with 95% accuracy when efficiently achieving recall and precision values. Apart from the presented model, a novel methodology for identifying the significant components that alter the churn prediction model has been proposed. The research findings indicated that a hybrid approach comprising the four methodologies achieved a higher level of accuracy than each algorithm done in isolation. Finally, a novel strategy for dimensionality reduction has been developed.

Hudaib, Dannoun, Harfoushi, Obiedat, and Faris (2015) have investigated three hybrid models to construct an efficient churn prediction model. These three models are divided into two phases. Clustering and prediction are two of them. The first step is responsible for sifting consumer data, while the second phase oversees forecasting client behavior. The first model comprises a K-means method for data filtering and an MLP-ANN (Multi-layer perceptron) for prediction. The second model employs hierarchical clustering in conjunction with the MLP-ANN. The third model is a hybrid of SOM and MLP-ANN. The research findings indicated that the hybrid model developed by integrating K-Means clustering with neural networks gave more accurate results. Simultaneously, the model constructed utilizing SOM clustering and MLP showed significantly higher outcomes in terms of churn rate value. The research had a shortcoming: the MLP-ANN execution time was equal for small and large data sets.

Fathian, Hoseinpoor, and Minaei-Bidgoli (2016) combined bagging and boosting techniques and constructed a hybrid churn prediction model. The research employed specialized predictive modeling techniques. They are the SOM (for clustering purposes), Decision Tree, ANN, SVM, and the KNN. PCA was used to reduce superfluous characteristics. Five variables are used to compare existing models: specification, accuracy, sensitivity, F-measure, and AUC. The research concluded that combining the clustering algorithms with bagging and boosting resulted in

more accurate findings. The study encountered significant problems in determining a more accurate classification.

Almuqren (2021) suggested that the SentiChurn model was initially validated for its efficacy using various conventional criteria. Social media mining to forecast client attrition remains unknown in the telecommunications sector. As a result, novel approaches for extracting real-time customer satisfaction data and forecasting customer attrition must be presented and implemented. They used a variety of standard metrics and found that the average precision of the model was 0.93, the average recall was 0.97, the average F1 score was 0.95, and the model accuracy was 95.8%. Secondly, based on a comparison of real and recent customer churn data provided by a telecom company, the model accuracy was 95.8%. Telecommunication companies can connect the models directly to their servers or database to produce real-time results.

All 20 attributes were used to train the very first logistic regression method. That well-trained model performs admirably. This model has an accuracy score of 84.7 percent. Subsequently, using the same features, a naïve Bayes method was trained. The model had a 91% accuracy rate inside the testing data set. Finally, the same elements were used to prepare the decision tree. The accuracy again for the test data set is 81.74 percent. The results of the three methods were then used to train a new model, with eight features having the most impact on the outcome. This study suggests that churn may be anticipated with a reasonable level of accuracy by utilizing this unique approach. The generated model outperforms an overall accuracy of 95% on a test dataset. ANN produces a robust customer churn prediction model with the other three machine learning algorithms. The novel model performs better (Mishra & Reddy, 2017).

The study by H.-Y. Lu, Xie, Kang, Wang, & Xie, (2017) has developed a churn prediction. When clients leave their brand or stop their services, churn takes place. Marks lower churn rates when potential churners are identified and retained through customs retention efforts. The study looks at the problem of classifying micro-posts as churning or not churning in relation to a specific brand. The study suggests that RNNs should be used to learn about migration indicators and churn indicators based on recurrent neural networks' recent success (RNNs) (Amiri & Daume III, 2016; H.-Y. Lu, Xie, Kang, Wang, & Xie, 2017). Consequently, a range of investigations has been conducted that adjust the telecommunications industry's customer churn title to different types of data mining and other approaches.

METHODOLOGY

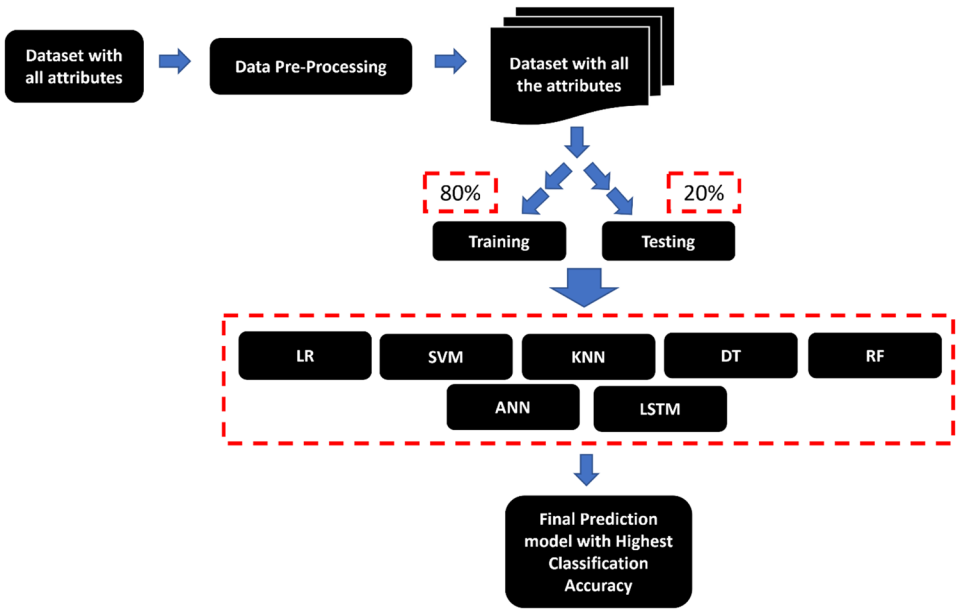
This chapter will go into detail on the methodology in various sub-sections. These subsections cover the research design, data gathering and analysis, and implementation. Additionally, the chapter will feature graphics that illustrate the methodology, numerous strategies, and models used.

As previously noted, various research gaps have been uncovered. A churn prediction model is constructed using a deep learning technique by considering different supervised approaches to address these limitations. The final model will predict both churners and non-churners in advance. This chapter summarises the various analyses conducted to ascertain customer attrition behavior. This section goes into greater detail about the methods and mechanisms by how the final model can be implemented. Additionally, Figure 1 illustrates the model’s high-level architecture. The following steps have been performed during this research

- 1. Data set and Requirement analysis
- 2. Data Pre-processing
- 3. Feature Extraction
- 4. Model construction

Each stage is described in detail below.

Figure 1. Proposed research methodology



Data Gathering

The first step toward analyzing consumer expectations for a novel or customized product is to conduct a requirement analysis. Prior to constructing any software project or model, it is critical to precisely identify the project's primary needs/requirements. Numerous techniques exist for requirement elicitation. Numerous methods can be utilized to accomplish the task of fact-finding. Interviews, brainstorming, questionnaires, online scraping, and data consumption via a Web API are just a few examples. A local telecommunications firm could be contacted to do this research. This research will collect and evaluate data on around 7100 post-paid subscribers. The data set includes information about the customers' previous behaviour. The following Table 1 summarises the content of the data set along with twenty-one attributes and their descriptions.

Table 1. List of attributes and their descriptions

No	Attribute	Description	Representation
1	CustomerID	The unique ID for each customer	Number
2	Gender	The gender of the chosen customer	Numeric
3	SeniorCitizen	Age range of the customer	Numeric
4	Partner	Partner of the customer	Numeric
5	Dependents	Is Customer Depends on another	Numeric
6	Tenure	The length of time a customer has been with the company.	Numeric
7	PhoneService	The Phone service that customer used	Numeric
8	MultipleLines	How many devices that customers use with the service	Numeric
9	InternetService	The internet service that customer used (Fiber Optic, DSL etc)	Numeric
10	OnlineSecurity	The Security Level	Numeric
11	OnlineBackup	The data backups	Numeric
12	DeviceProtection	The protection from the attacks from the internet	Numeric
13	TechSupport	Technical support from the service	Numeric
14	StreamingTV	The streaming TV Used	Numeric
15	StreamingMovies	The streaming movie Used	Numeric
16	Contract	How long the service contracted with	Numeric
17	PaperlessBilling	Billing via cards, bank payments	Numeric
18	PaymentMethod	Bill payment method of the customer	Numeric
19	MonthlyCharges	Monthly charges to the package	Numeric
20	TotalCharges	Total charges to the all services	Numeric

Data Pre-Processing

Data Pre-processing is the process of deleting data from a data set that is incomplete, noisy, or inconsistent. This is a necessary step before developing any prediction model. There is no universally applicable pre-processing step for all types of data. Because data sets are unique. For instance, data derived from images is distinct from data derived from sound. Nonetheless, normalization is a pre-processing approach applied in various contexts. Normalization has been planned to lower the variance between available data and constrain the attributes to a set range.

Python Pandas library was utilized in the data pre-processing stage. The following tasks were completed with the assistance of the library.

1. Store the raw data into a CSV file.
2. Load data which includes in the CSV with pandas in Python.
3. Check the number of columns and rows in the dataset.
4. Removing columns that aren't needed.

Data collection included a field titled “CustomerId” that assists in individually identifying each consumer. Since it is useless for prediction, it has been excluded from the final set.

5. Check all null values and duplicate values in the dataset.
6. Convert all variables in the dataset to a common type like integer or double
7. Detect the outliers and replacement
 - a. At first, outlier values for each column were discovered. (First quartile (Q1), third quartile (Q3), and interquartile range (IQR) values were used in this instance for all columns)
 - b. Replace outlier discovered cells with random values within the quartile range.
 - c. Make a fresh dataset that excludes the outliers.
8. Normalize the dataset

In this situation, the Min-Max Scaling technique was used.

9. Handling Missing Data

Frequently, real-world data contains a high proportion of missing values. Data corruption or a failure to record data can result in missing values. Most machine learning algorithms do not tolerate missing values hence managing missing data is crucial during the dataset's pre-processing. Because some records in the dataset

lack specific attribute values, they must be processed before the implementation can be used. Missing values can be handled in a variety of ways. Numerous examples include removing rows with missing values, utilizing missing value handling methods, predicting missing values, and imputation. Missing values are handled in this dataset by removing the rows containing the missing values.

10. Data Scaling in a standardized manner

Python “StandardScaler” library has been used in this case.

Feature Extraction

The technique for feature extraction is a subset of the dimension reduction strategy, which categorizes the acquired raw data. By choosing and integrating variables into functions, feature extraction optimizes huge data sets’ functionality, minimizing the amount of data. Additionally, separating the data sets in half is vital in this process. The first half of the lesson (80%) should be devoted to modelling instruction and the second half (20%) to evaluation. This is critical since the data collected for training and evaluation do not adequately reflect the model’s performance in real-world scenarios.

Model Implementation

The expected model is trained using a variety of prediction methodologies. Scholars have previously established numerous models. These are quite adaptable and can be used for many applications. The researcher trained the model using various classification algorithms, and the technique with the highest precision was chosen. This phase employs a variety of methodologies, including an ensemble approach and a comparison of available prediction algorithms. The implementation part of this chapter discusses these approaches in greater depth.

Every model has been developed using the 3rd party machine learning libraries called “Scikit Learn” and “Keras.” After the model implementation, each model was tested against basic evaluation metrics for the highest classification accuracy.

These models have been considered and developed based on two approaches. They are

1. Machine Learning Techniques Based Approach
2. Deep Neural Network-Based Approach

Machine Learning-Based Approach

Using the well-prepared data set and the research measures, the researcher proposed using a neural network-based strategy to identify churn non-churners using the well-prepared data set and the research measures. The researcher evaluated the neural network's performance and other machine learning approaches, including logistic regression, SVM, KNN, decision tree, and random forest.

Sklearn is used to implement logistic regression, SVM, K-NN, decision tree, and random forest, while Python is used to construct the Neural Network. A perceptron is a fundamental unit of a neural network. A perceptron is a neural network that takes in data from the environment and multiplies it by weights. The data is then sent through an activation function to provide an output (logistic regression, ReLu regression, tanh regression, or identity regression). These perceptrons layers are joined to form neural networks, referred to as multi-layer perceptron models.

There are three layers in a neural network: input, hidden, and output. The input layer directly absorbs data, but the output layer provides the intended result. Intermediary computing occurs in intermediate layers, often known as hidden layers.

Supervised machine learning algorithms are a type of machine learning algorithm that may be used to generate new data from labelled data and predict future events or labels using previously learned data. This learning style requires the presence of a supervisor (labels) to guide or correct. The output values are anticipated using the learning process once the known training set is analyzed. The output of the learning system can be evaluated to the actual output; if there are any inconsistencies, they can be addressed, and the model updated accordingly.

The researcher used the sklearn in Python. The researcher used five different classifiers for this, along with essential ANN. The used classifiers are as below,

1. Logistic regression,
2. SVM,
3. KNN,
4. Decision tree
5. Random Forest

Deep Neural Network-Based Approach

An artificial neural network (ANN) having numerous layers between the input and output layers is known as a deep neural network (DNN). Neural networks come in various shapes and sizes, but they all include the same basic components: neurons, synapses, weights, biases, and functions. LSTM model was implemented under this approach. LSTM networks are recurrent neural networks that may learn order

dependence in sequence prediction challenges. This is a requirement in various complicated issue domains, including machine translation, speech recognition, and others.

Performance Metrics Considered for Comparing the Algorithms

The researcher employed several performance criteria to assess the data. These are the most used measures in the field of performance evaluations. Recall and accuracy are just a few instances of precision, recall, and root mean squared error (RMSE).

Mean Absolute Error (MAE) was used as a measurement criterion, as well as RMSE, mean square error (MSE), and receiver operating characteristics (ROC). To calculate the MAE, add all the absolute differences between the predicted and actual values, and divide the result by the total number of classifications. The RMSE is the average of the squares of the discrepancies between the actual and anticipated outcomes. For comparison reasons, the new error metric posterior is translated into novel units by adding one to all errors and calculating the square root of the squared error mean squared error. The MSE loss function is perhaps the simplest and most widely used loss function. Split your model's predictions by two, square them, and then average the difference across your dataset to calculate the MSE. The ROC curve is used to analyze binary classification problems in machine learning. As a result of plotting the TPR vs FPR at various threshold values, this probability curve can tell the difference between "signal" and "noise."

Performance comparison of many algorithms for predicting churners and non-churners was obtained. This step might allow further modelling of this technique toward a "Supervised Learning Technique" in machine learning if the target variable and strongly correlated variables were established during the first investigation. Various algorithms have been developed and examined to specific assessment indicators to forecast the findings. Comparisons made during this method are detailed in greater detail below. Almost 7000 subscriber characteristics were evaluated during this process, including 21 traits and one target variable. Randomly selected data sets are used for training and testing, with 80% for training and 20% for testing.

Python has been used to implement machine learning algorithms. For this research, Scikit-learn was employed as the machine learning library. Scikit-learn is a machine learning Python library that is free and open-source. The researcher employed three distinct approaches to identify the most appropriate categorization system. The main goal of this study is to create a churn prediction model using supervised learning techniques. The outcomes of various approaches will be described in this part, including crucial demographic data and interpretations.

RESULTS AND FINDINGS

Machine Learning-Based Approach Results From Chosen Algorithms

This section will determine the optimal classification method for anthropometric measurement profiling.

This approach examines the classification precision of (Random Forest, Logistic Regression, SVM, K-NN, ANN, and Decision Tree) using the gathered data set. These six algorithms were chosen because those methods are widely used in Data Mining (DM) and Machine Learning (ML). The classification was carried out using Python.

With the data cleaning method that the researcher did. The Basic ANN model consists of an input layer and an output layer. The hidden layer's activation function will be ReLu, whereas the output layer's activation function will be Sigmoid. Even though the results show that the Logistic regression Algorithm performs with 80.46% accuracy compared to the accuracy levels of other algorithms mutually performing. So, according to the results obtained from the algorithms, the Logistic regression is performing well rather than using the other five algorithms by considering the basic evaluation metrics and other parameters. Figure 2 represents the confusion matrix heatmap obtained for the logistic regression. A confusion matrix is a method for summarizing a classification algorithm's performance. If you have an unbalanced number of observations in each class or your dataset has more than two classes, classification accuracy alone can be misleading. Calculating a confusion matrix can help you understand what your classification model is getting right and where it is going wrong.

Figure 2. Confusion matrix of logistic regression



In addition, cross-validation was utilized in conjunction with the previous analyses to identify which method best deals with different testing and training data percentages by considering the five-fold K-fold cross-validation technique. The results explored from the cross-validation are explained in detail below in Table 2.

Table 2. Fivefold cross-validation technique results

Considered Supervised Techniques	1 st Fold Accuracy (%)	2 nd Fold Accuracy (%)	3 rd Fold Accuracy (%)	4 th Fold Accuracy (%)	5 th Fold Accuracy (%)	Mean Accuracy (%)
Logistic Regression	80.45	81.17	78.81	80.80	80.16	80.28
SVM	80.95	81.31	78.52	79.94	79.30	80.01
KNN	77.47	76.26	75.04	75.96	77.17	76.38
Decision Tree	73.06	73.99	72.33	72.83	73.12	73.06
Random Forest	79.67	79.60	76.81	79.16	79.66	78.98
ANN	79.00	74.00	76.00	78.00	76.00	76.00

Logic Regression outperformed all other machine learning algorithms from the initial results obtained from basic evaluation metrics and the confusion matrix.

Deep Learning-Based Approach

Most of the time, DNN algorithms produce more accurate results in classification and regression problems. So, under the DNN approach, an LSTM model was developed with the following parameters during this research. The second model consists of an input layer, two hidden layers, and an output layer. The hidden layer's activation function will be ReLu, whereas the output layer's activation function will be Sigmoid. In addition, the results obtained from the LSTM model for accuracy and loss are depicted in Figure 3 and Figure 4, respectively.

Figure 3. LSTM model's accuracy graph against epoch

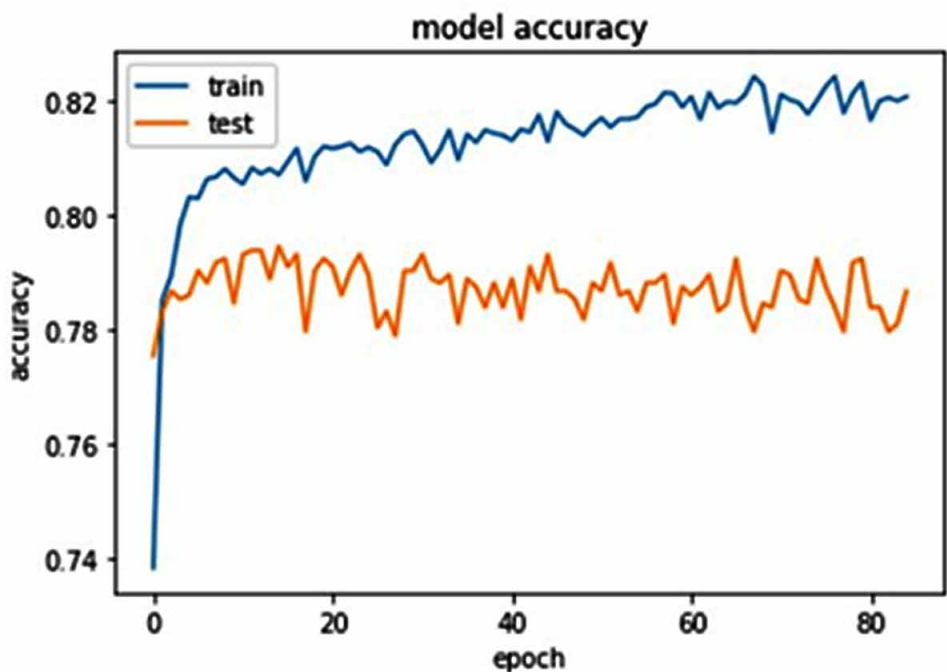
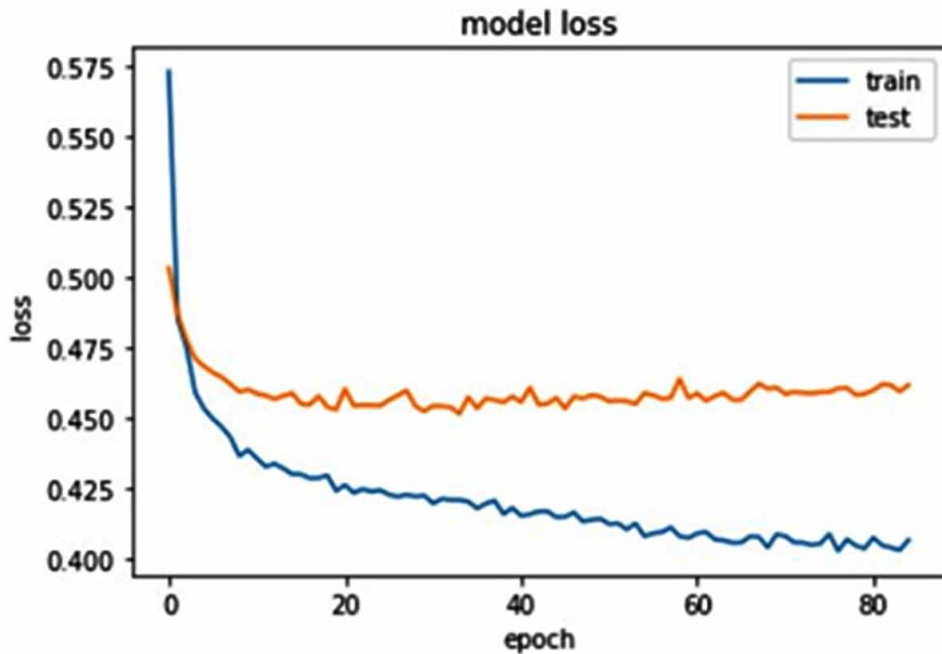


Figure 4. LSTM model's loss graph against epoch



From the models mentioned above, the researcher has identified that in terms of accuracy, the LSTM model outperforms all other models with the highest accuracy of 82.46%

Machine learning techniques were inferior to neural network-based methods in all areas. The deep neural network achieved an accuracy of 82.46%. In addition to the accuracy, the researcher has also measured other aspects of performance, which are detailed in the preceding section. Table 3 illustrates the outcomes of this strategy for each of the categorization algorithms utilized.

Table 3. Classifications of the LSTM and other machine learning techniques

Model	Accuracy (%)	MAE	RMSE	Precision	Recall
LSTM	82.46	0.178	0.457	0.82	0.81
Logistic Regression	80.46	0.205	0.453	0.75	0.72
SVM	78.61	0.214	0.463	0.74	0.71
KNN	77.54	0.250	0.502	0.65	0.65
Decision Tree	74.98	0.292	0.541	0.69	0.68
Random Forest	70.79	0.255	0.474	0.73	0.69
ANN	78.18	0.208	0.483	0.74	0.71

These findings show how accurate the experiment was at predicting what would happen. Using an LSTM deep neural network, 82.46 percent accuracy was achieved. Logistic regression had a success rate of 80%, even though the research results demonstrate that the LSTM is the most effective and accurate compared to other classification methods. LSTM model's precision and recall values were also calculated along with the model's accuracy. The model's precision and recall were both excellent. DNN performance is, therefore, quite precise.

DISCUSSION, CONCLUSION AND FUTURE WORKS

Customer attrition behaviour prediction is crucial for almost all firms, including start-ups. During this research, churn management in the telecommunications industry was thoroughly tested as an experimental method. Consumers choose to escape as this market becomes more competitive. When the approach is employed, churners can be easily predicted in advance. This investigation reviewed over 7000 subscriber records from a well-known telecommunications company. Prior research has proven that training and evaluating the machine learning model requires historical data on churners and non-churners (the goal variable). However, this approach does not require any pre-existing data having the property of churners and non-churners.

Additionally, this study attempted to adapt different supervised machine learning techniques, including one approach on ANN and one based on DNN. A range of performance metrics was used to evaluate this strategy. Additionally, utilizing a combination of NN and DNN, a complete comparison of machine learning algorithms such as Decision Tree, Logistic Regression, Random Forest, SVM, and K-NN has been undertaken.

Following that, rigorous cross-validation of the algorithms was conducted to develop a more accurate final prediction model. The LSTM algorithm based on the DNN technique achieved 82.46% accuracy while keeping a low error rate of 17.54%.

Finally, the prediction model was constructed efficiently using the DNN's LSTM technique. This has enabled the prediction of churners and non-churners in advance. This research could be expanded by constructing and making publicly available a general-purpose churn prediction model. Additionally, by modifying hyperparameters before cross-validation, the algorithms for supervised learning and deep learning techniques will attain a high level of predictive performance. Identifying the churners as mentioned by the prediction mentioned above model may provide confidence in future researchers to pursue and attempt to integrate unsupervised and supervised methodologies for further model implementation.

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KEY TERMS AND DEFINITIONS

Artificial Neural Network (ANN): ANN seeks to mimic the network of neurons that make up the human brain, allowing the computer to learn and make decisions in a human-like manner. Traditional programming computers create ANNs that operate like interconnected brain cells.

Deep Learning: Deep learning is a method for teaching computers to mimic human behaviour. Deep learning models can sometimes outperform humans in terms of accuracy.

Deep Neural Network (DNN): A DNN's input and output layers are separated by multiple levels. Neurons, synapses, weights, biases, and functions are crucial components of neural networks, regardless of their size or configuration.

Machine Learning: This is the case of algorithms that learn on their own through experience and data intake.

Supervised Learning: Computers are educated on labelled training data and then used to predict output in supervised learning, a subset of machine learning.

Unsupervised Learning: Machine learning procedure that involves the construction of models without the usage of a training set. Models unearth hidden patterns and insights in the data that is provided.

Chapter 10

Customer Journey Redefined: Social-CRM and Beyond

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ABSTRACT

The rising popularity of social media has added a new challenge that companies are facing today since they can hardly manage the information that is shared about their products and brands among the members of these social platforms. Customer relationship management strategy, in this respect, has transformed into social-CRM through which the social media channels are integrated with the CRM tools. This significant change in companies' interactions with customers demands not only different ways of doing business but also managerial commitment, participatory human resources, and technological infrastructure. The are multiple objectives of this chapter. Firstly, the aim is to provide detailed information about social-CRM and its differences from the traditional CRM. Secondly, how social-CRM affects consumers' changing roles during their purchase journeys and helps firms in creating personalized experiences for customers will be explained. Finally, what social-CRM demands from managers and how they can develop strategies based on this new CRM orientation will be discussed.

INTRODUCTION

The increasing use of Internet worldwide and the developments in technology have been influencing consumers' purchase activities dramatically (Lemon & Verhoef, 2016). The widespread acceptance of e-commerce has resulted in intertwined digital and physical processes. It has become difficult for firms to satisfy the demands and

DOI: 10.4018/978-1-7998-9553-4.ch010

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expectations of digital-savvy customers who can get and share information about products and services easily and quickly. Besides, co-creation of value has been the dominant paradigm which means that consumers are not only evaluating the value offered by companies but also participating in the value creation process (Vargo & Lusch, 2008).

In addition to the digitally-powered customers and their changing needs, more and more customers have been getting and sharing information about products and brands through widely used social media platforms. Therefore, given the impact of social media popularity and customers' unique capabilities on their purchase behavior, companies are required to adopt their business models so that they can communicate with customers more effectively (Verhoef et al., 2021). Customer relationship management (CRM hereafter) strategy, in this respect, has transformed into social-CRM that refers to the integration of existing CRM tools with the social media channels.

This chapter focuses on the definition of social-CRM and how it differs from the traditional CRM. Besides, the effects of social-CRM strategy on customer experience will be explained with a concentration on providing personalized experiences for consumers. Finally, what a social-CRM strategy requires from companies in terms of managerial orientation, human resources, and information technology infrastructure will be examined.

BACKGROUND

Operating in a highly competitive and dynamic business environment, firms for a long time have been aware of the importance of CRM strategy. Due to its multidisciplinary nature, previous literature about CRM includes different definitions instead of a widely agreed one (Buttle, 2004; Ngai, 2005). Nevertheless, CRM can be defined as firms' strategic uses of technological tools and resources to manage interactions with current and potential customers (Kincaid, 2003). CRM can also be conceptualized as a comprehensive strategy for acquiring and collaborating with customers to create superior value for both parties (Parvatiyar & Sheth, 2001). The development and implementation of an effective CRM strategy is no more a choice but a requirement for enhanced customer loyalty and success in terms of profit and market share.

Previous studies on CRM include topics such as knowledge management and datamining (Verhoef et al., 2010; Payne and Frow, 2005; Shaw et al., 2001; Ha et al., 2002), management, planning and strategy (Boulding et al., 2005; Ling & Yen, 2001), segmentation, targeting, and positioning (Hymas, 2001), customer value and loyalty (Lee-Kelley et al., 2003), e-commerce and e-CRM (Feinberg et al., 2002; Taylor & Hunter, 2002), and sales management (Ahearne et al., 2007).

Consideration of several different concepts for studying CRM already reflects its multidimensional nature.

On the other hand, rapid growth of Internet and technological tools worldwide has transformed the way firms are managing their relationships with customers (Bauer et al., 2002). Consumers are engaging with products and brands through multiple digital touchpoints- points where brands interact with customers- and it has become crucial to examine how different touchpoints influence consumers' decisions during their purchase journeys (Hallikainen et al., 2019). Among these digital touchpoints, the ones that significantly influence consumer behavior are the social media channels. Social media platforms have been key places where consumers are exchanging their experiences and opinions about products and brands with other customers (Fauser et al., 2011). The increasing popularity and usage of social media by consumers require firms to develop new CRM capabilities beyond traditional tools and tactics (Pansari & Kumar, 2017; Wang & Kim, 2017). Social-CRM, in this regard, integrates social media with the existing CRM systems and helps firms to effectively manage their relationships with customers and enhance their satisfaction (Trainor et al., 2014).

CRM and Social-CRM

CRM refers to the systematic management of relationships with customers across various contact channels (Reinartz et al., 2004) by continuously getting knowledge about customers and their changing purchase activities (Payne & Frow, 2005; Verhoef et al., 2010). Besides, CRM includes not only the acquisition of consumer knowledge but also the diffusion of this knowledge to the interested parties (Boulding et al., 2005). Companies have also realized that a successful CRM strategy takes into account a combination of technological tools, human resources, and other capabilities (Rapp et al., 2010). The processes should be integrated across different departments of the firm in order to provide value to customers. Intelligent use of technology is crucial; CRM technology should be linked to customer-centric strategic resources (Coltman, 2007).

Together with the rapidly growing popularity of social media, consumers have been connecting with other consumers and firms through social media and actively participating in the creation of experiences (Hanna et al., 2011). The expectations and needs of these "social" consumers can not be satisfied with the traditional CRM tools (Berthon et al., 2012). Besides, companies must track what consumers are saying about their products in social media (Day, 2011). Therefore, firms have observed the need to revise their existing ways of managing customer relations. A more collaborative and network-focused approach is needed for managing customer relationships.

Social-CRM, in this respect, has emerged as an extension of traditional CRM (Greenberg, 2010) which is defined as *“the integration of traditional customer-facing activities including processes, systems, and technologies with emergent social media applications to engage customers in collaborative conversations and enhance customer relationships.”* (Trainor, 2012). This expanded concept of CRM represents the technological and social changes brought by social media networking (Trainor et al. 2014). Social-CRM strategy provides a guideline to companies for obtaining useful information about customer engagement on social media and leveraging this information to improve relationships with customers that in turn positively affects customer loyalty and financial outcomes.

When social-CRM technologies are compared with those of the traditional CRM, certain differences are observed. An important distinction is the nature of the customer relationship considered. Traditional CRM focuses on one-to-one customer relationship. Social-CRM, on the other hand, considers network of many-to-many relationships. In other words, the company considers not only the customers themselves but also their interactions with the company and with the other customers through social networks. This “network” approach instead of a “one-to-one” strategy clearly shows the different customer relationship perspective brought by social-CRM. Another difference between social and traditional CRM is the emphasis given for the creation of value. Traditional CRM assumes that value is created by the firm. Social-CRM, instead, considers co-creation of value: consumers and firms collaborate to create value (Trainor, 2012).

Social-CRM and Customer Experience

Customer experience is conceptualized as a customer’s journey with a firm over time across multiple touch points during the pre-purchase, purchase and post-purchase stages (Lemon & Verhoef, 2016). Consumer touchpoints include web sites, product catalogues, emails, and many other advertising tools. The strength and effect of each touchpoint at each stage of the customer journey may change. For example, a web site may have an impact on consumers before they make purchases (pre-purchase stage) or during the purchase stage depending on the characteristics and expectations of the consumer, purchase quantity and timing, and the product to be purchased. Salespeople may influence consumers’ decisions before or during the purchase stage. A call center may be a touchpoint after the sales activity. Shortly, customer experience has become more complex due to consumers’ interactions with firms through several touch points. Understanding the dynamics of customer experience is not easy since it includes cognitive, emotional, behavioral, sensorial, and social components (Verhoef et al., 2009).

In addition to its multidimensional characteristic, customer experience has also become social after the emergence of social media platforms through which Internet users interact with each other. User-generated content constitutes one of the main characteristics of the social media. Creative consumers generate value-added content in social media and influence other consumers who are using the same platforms (Presi et al., 2014). Uses of social media tools have enabled customers to interact with companies and have empowered them to take active roles in co-creation of experiences (Pralhad & Ramaswamy, 2004). Companies are trying to offer personalized experiences to consumers by communicating with consumers through social media platforms. In other words, the implementation of a social-CRM strategy by firms benefits consumers in many ways such as getting quick responses to their problems or finding the right products that will satisfy their needs.

Companies' social-CRM strategies influence customers' experiences in many ways. Firstly, firms are aware of the fact that they can understand and forecast consumers' purchase activities only by being active in social platforms (Choudhury & Harrigan, 2014). Consumers' changing behavior in the pre-purchase, purchase or post-purchase stages (Lemon & Verhoef, 2016) of the customer experience are extensively monitored by companies that are using social media tools. This provides satisfaction for consumers' experiences since they know that their actions are observed by companies and they can get feedback whenever they need. Secondly, brands can have better relationships with customers through the use of social-CRM tools by understanding the importance and roles of brands for consumers within their social environments. Knowing that consumers are buying and consuming specific brands for satisfying their not only physical but also psychological and social needs, brands interact with consumers via personalized incentives and messages in the social platforms in order to create value for their expectations (Arora et al., 2021). Thirdly, customers' widespread usage of social media results in being active participants instead of passive actors which in turn provides them strength and control during their experiences (Trainor, 2012).

Managerial Implications

Social-CRM brings a new dimension to traditional CRM since it requires firms to deal with conversations and relationships between consumers instead of just analyzing data and information about consumers. Social-CRM focuses on customer engagement and firms are using metrics such as website traffic, social mentions, tracking clicks, repeat visits, and volume of followers (Castronovo & Huang, 2012).

The implementation of a successful social-CRM strategy requires specific conditions to be met by the company. The change brought by social-CRM has to be embraced by the sales and customer service teams. Employees' information

technology skills are also very important since these skills can help them to gain customer insights (Medjani & Barnes, 2021). Besides, employees should understand why there is a need to revise the way relations with customers are managed. They should have the motivation to learn and to use new tools knowing that they will be better able to respond to consumers' expectations and problems. Organizational culture should quickly adapt to any necessary changes-change in CRM or in another strategic tool- in the business strategy of the firm. Resistance to change will slow down the business and the company will be late in terms of gaining the benefits of social-CRM. Managers at this point play crucial roles since they are expected to create this company atmosphere (Ahani et al., 2017).

Social-CRM requires firms to replace their traditional CRM approach with a perspective that emphasizes customer empowerment and co-creation of value (Sigala, 2018). The adoption of an effective social-CRM strategy depends very much on using the right techniques and tools in order to meet the target customers' expectations. Transformation of managing relationships with customers to a technology-driven and social mindset triggers the need to realize different ways of interactions and communication channels (Jalal et al., 2021). It is very important to state here that interactions and communication do not refer only to a firm and its customers but also to the communication and interaction between the employees within a company.

Effective social-CRM strategy can be achieved by organizational capabilities that allow a company to benefit from digital transformation by focusing on overall strategy in addition to technological changes (Kane et al., 2015). In other words, capabilities demonstrate whether a firm is able to combine social media with its existing CRM business model (Trainor et al., 2014). A company should integrate its resources, processes and employees in order to gain competitive advantage by social-CRM (Payne & Frow, 2005).

FUTURE RESEARCH DIRECTIONS

The use of technological tools in CRM helps companies to achieve increased customer loyalty, improved customer service, and cost reductions through improved efficiency (Suoniemi et al., 2021). On the other hand, the success of CRM initiatives depends not only on using IT-related resources effectively but also adopting the other capabilities of the firm to the demands of the rapid technological environment. CRM System Capability (CRMSC) construct, which mainly refers to a firm's ability to integrate and deploy the resources required to successfully implement a CRM tool, in this regard, differentiates a firm from its competitors in terms of effective communication and feedback (Karim et al., 2007).

The transformation of CRM to social-CRM requires not only a change in perspective but also revision of plans, tactics, and resources. Further research should investigate the factors to be considered by firms for a successful social-CRM strategy. How can the existing resources be used? What additional resources does a firm need? Does the company have to change its organizational structure? Is the corporate culture compatible with the social-CRM principles? The answers to these questions can provide useful clues to firms since transition to social-CRM is not easy and can not be achieved suddenly.

CONCLUSION

Consumers' interactions with each other through social media create opportunities for firms. Previous studies examine the effects of social media on firm performance and customer relationship capability (Wang & Kim, 2017), consumers' perceptions of brands (Schivinski & Dabrowski, 2016), consumer engagement (Barger et al., 2016), purchase intention (Hajli, 2014), and consumer attitudes (Arli, 2017). Given multiple digital touch points, where consumers interact with firms and their products, companies can make use of the big data that is available from different channels instead of trying to get feedback from customers (Kim & Wang, 2019).

However, the widespread uses of social media also has created challenges to managers. Multitasking Internet-savvy consumers are getting thousands of messages everyday via chosen means of communication and getting their attention has become much more difficult. These empowered customers have different expectations and firms are required to develop new business models and to find the right communication channel to interact with these social customers. In other words, companies have less control over the customer journey (Brynjolfsson et al., 2013).

Therefore, the only way to succeed in managing this dynamic, complex and social digital environment is the incorporation of the operational capabilities of the traditional CRM with the social capabilities of social media and networks, namely social-CRM. Social-CRM can help firms engage with customers in real time, provide quick customer service, and create a positive brand image. The important point here is to have patience for gaining these benefits of social-CRM since creating a company-wide shift to this new way of interacting with customers will take some time.

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KEY TERMS AND DEFINITIONS

- Co-Creation of Value:** Value is jointly created by the customer and the company.
- Datamining:** The process of uncovering valuable information from large data sets.
- E-Commerce:** Buying and selling products and services via internet.
- E-CRM:** Application of Internet-based technologies to achieve CRM objectives.
- Internet-Savvy:** A person who has detailed information about Internet and can use it for her/his needs other than just surfing or downloading.
- Social-CRM:** The integration of social media channels into CRM platforms.

Chapter 11

Social Customer Relationship Management (S–CRM)

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ABSTRACT

Customer relationship management (CRM) has evolved significantly in recent years, from a strategy that focused exclusively on developing financial links with clients to one that fosters both transactional and interactional interactions. As a result, a new type of CRM called social customer relationship management (SCRM) or CRM 2.0 has emerged. This research presents and builds a conceptual model to address the connections between customer relationship management, social media technologies, customer engagement, positive word of mouth, and brand loyalty. Adding to the conventional relevance of customer relationship management, this study presents how Social CRM has become the need of the hour. This research would be helpful to both service and product-based organisation. A conceptual model has been developed to show how social media technologies lead to both positive word of mouth and brand loyalty. SCRM (social customer relationship management) is a new paradigm that influences customer-organization relationships by allowing customers to govern the connection via social media.

DOI: 10.4018/978-1-7998-9553-4.ch011

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INTRODUCTION

“Social customer relationship management” (social CRM) is a new concept to customer engagement that uses social media (Itani, Krush, Agnihotri, and Trainor 2020). Social CRM, in its most comprehensive form, it is a concept and a practice that combines social media and social networking with standard CRM tools, procedures, and practices to increase customer interaction, especially customer service (Kritchayawised, 2019). The social consumer is a client who uses social software and lives in a world defined by constant connectedness, mobility, multichannel, and the advancement of the Internet of Things. Customers can share their thoughts about a product or service by publishing their opinions on the Internet. Companies take part in the social network of people who are connected to it. (Sergio Orenga-Roglá & Ricardo Chalmeta 2016). Businesses when make best use “SCRM” have observed a favourable result on their business (Chatterjee, et.al 2021)

With the use of social media has resulted into questioning of conventional “CRM”. A “SCRM” approach is the latest type of “CRM” that is powered by online media innovations and provides a better means to manage customer interactions. (Jalal, Bahari, M., & Tarofder, A. K., 2021).

Traditional CRM tactics have grown obsolete as a result of technological advancements. Customers are currently determining communication channels and driving conversations, and businesses must accommodate this transition. The latest buzzword is social CRM, and it is a great approach to deal with it. Change that is innovative. Large and small, most businesses can now communicate with their customers and improve relationships with a smart Social CRM strategy that focuses on the customer. Unlike traditional CRM, organisations are now supporting the collaboration of social efforts and experiences. Customers can be found on social media platforms. Traditional “Customer relationship management”, online media, and developing innovations spawned the concept of “SCRM”. The goal of “SCRM” is to develop a more personal relationship with customers by tracking communications and engagement, chasing down leads, analysing customer viewpoints, and responding appropriately to enhance by reviewing incoming data in the shape of the feedback from customers. This helps in gaining deeper marketing insights from the data. Identifying trends and marketing possibilities are some of the things that help marketers to understand customers well. (Arora and Sharma, 2018)

In this age of new technologies, using social media to stay competitive in the market is a requirement. Social media is a tool for managing consumer interactions and keeping them close. The goal of this article is study how web-based media can assist with customer relationship management. The use of online media advertising is an essential piece of making a CRM system. CRM places the client at the centre

of the business and coordinates showcasing methodology towards that path. (Cerchia Alina Elena, 2016)

CRM assignments support call centre effectiveness, end rates, publicizing measures, customer profiling and zeroing in on, cost hold reserves, higher customer piece of wallet, and efficiency's gives organisations more approaches to utilize information and data to comprehend their clients better and co-make esteem with them. This requires the incorporation of methodology, individuals, activities, and promoting across divisions. (Kapoor, et.al 2018) Product-centric techniques are being replaced by customer-centric approaches in this new era, with the consumer being the primary focus. Marketers have switched their focus to their customers and, more specifically, on their experiences, which will be more important in the future.

To improve their customer-related performance, businesses must build new "Social customer-relationship management" (SCRM) capabilities. An organisations effectiveness of SCRM is defined as how social media resources will result into the desired level of revenue generation and bond developed with customers. This interpretation concentrates on the organisation's capability in the acquisition, generation, organisation, and integration of data information gleaned from clients' social media interactions preserve and develop the customer relationship, as well as the company's own monetary performance (Kim & Wang, Z. -2019)

Objective of the Study

The main goal of this chapter would be to test the determinants of "Social Customer Relationship Management" and their influence on customers, thus resulting into more effective customer reach out. The other aim of this study is to show how online media might be coordinated into "Customer Relationship Management" (CRM) methodologies and to characterize the advantages for organizations. Another aim of the study is to know how consumers themselves can reach out to other consumers. Consumers can reach a large audience with the use of online innovations. As a result of the low costs, it is stated that the power of consumers is growing (Jarl Elfving & Karl Lemoine -2012). The study will contribute to knowing more about how, to cope with the scenario, a firm should retain its relationship with its customers so that they do not abandon its products and services—in other words, customer loyalty. Customer Relationship Management (CRM) is one method of developing customer loyalty. (Mailangkay, A. B., & Juwono, E. -2015).

To grasp the full conceptual framework of Social Customer Relationship Management, a detailed literature review will be done to combine the fragmented pieces of knowledge.

Introduction to “Social Media”

The globe has turned “glocal” rather than “global,” pressing its monetary, social, and political limits to make a solitary improvement stage. The use of Internet has increased as a result of media convergence, giving rise to “Social Media”. “Web-based media” has been utilized in an assortment of circumstances to depict different advancements and their capacities. (Appel, et.al-2020). The creation, consumption, and sharing of details over channels for “Social reciprocity can all be classified as social media. Social media have taken over the virtual world. Even a decade ago, it completely transformed the way people communicated.

Social media is referring to the variety of technologies and their capabilities. The use of social media has increased exponentially. Social media has totally transformed how people used to communicate in earlier. “Social Customer Relationship Management” is a sequel of traditional CRM, it is more focused on consumer engagement and tries to maintain a long relationship with customers. (Christos Giannakis – Bompolias, Christina Boutouski-2014)

The “Web 2.0 technology and social media platforms”, have a big number of people worldwide engaged and attached. On the other hand, businesses are beginning to see such technology as useful ways to engage with their customers more. Academicians and researchers have also concentrated their attention on related concerns of “Social media marketing” in order to improve their comprehension of such occurrences in the marketing field. (Alalwan, et al. -2017)

Impact of “S-CRM” on Service Innovation

“SCRM” builds on an analysis of enormous amounts of data made accessible on social media by corporations about their customers. The “raw materials” for the many data sources and the IT required for data collection, saving, analysis and usage (Malthouse et al., 2013; Mekhuma, 2020). It is crucial first to extract value from the databases, then process the raw resources. Finally, appropriate means of performance measurement for each component need to be identified. Each part of social CRM produces results in a firm’s performance (Diffley et al., 2018).

Conceptualising social CRM in this study is significant in terms of understanding how it affects numerous dimensions, including Service Innovation. Diffley and McCole (2015) argued that businesses utilise social CRM to maintain long-term connections by providing customers with opportunities to participate in value co-creation initiatives. The resources and capabilities of the business both bring attention to the importance of these resources and capabilities for Innovation and provide the first step in our sequence of results that describes how “SCRM” leads to firm performance (Mekhuma, 2020). The social CRM evaluation is an essential

component of innovation initiatives because of the resources and skills it provides. When linked with information across consumer touchpoints, data sources accessible through the RBV, such as the Web and other information resources, can contribute to developing new business ideas (Trainor, 2012). Because of the competitive climate in which hotels must operate, dynamic social CRM changes can be attributed to ongoing innovation activity (Malthouse et al., 2013). According to Lusch et al. (2007, p9), “a firm cannot maintain the value proposition and offered services they previously offered; consequently, service innovations are imperative.” These innovations are contingent on the constant renewal, creation, integration, and transformation of the firm’s competencies. Customer interactions are used to implement this new way of doing things. Also, the notion of consumers as co-innovators has fostered Innovation in a service setting because invention incorporates intangible results of customer partnerships (Michel et al., 2008; Vargo, 2008). New products, design through to delivery, and procedures for serving clients are all included here (Lusch and Vargo, 2006).

Organisations have real-time customer data available with technology-based CRM software, and they can use this data to present Social CRM. Customers can keep their needs and preferences up to date by implementing updates to both services and products. Companies with high CRM capabilities have a competitive advantage in terms of the level of customer information collection, organisation, and the decision of which customers to prioritise (Michel et al., 2008). The team tasked with product development will have the necessary information delivered to them. Through information integration into product creation, organisations can innovate and develop new goods. Products can be made that serve a need for customers, and new ones can be introduced to fill those needs. Researchers have determined that “Social CRM” has resulted into positive outcome on service transformation. (Malthouse et al., 2013; (Mennens, et al, 2018)

“Social Customer Relationship Management”

The notion of “Customer relationship management (CRM) 2.0” has rapidly growing as the Internet continues to act as the preferred and most widely used communication tool for customers and enterprises alike, and as more and more social networking media gain importance. CRM 2.0 aims to make product and service providers and the people they sell to have more open, collaborative, and mutually beneficial relationships. (Wang, X., Dugan, R., & Sojka, J. -2013).

To optimise profitable opportunities, social CRM necessitates learning a new technique of customer connection management, listening, and changing business communications. Business can continue as usual but do not lose out on opportunities

Social Customer Relationship Management (S-CRM)

to hear what your consumers are saying about and to you on social media. (Milan Kubina, Viliam Lendal-2014)

“Web 2.0 and social media” (SoMe) gives up new avenues for cooperation and co-creation, allowing for more customer-centric management. SCRM (Social Customer Relationship Management) addresses these issues and seeks high stakeholder engagement to form mutually beneficial relationships (Lehmkuhl, Tobias & Jung, Reinhard -2013).

To engage customers in collaborative conversations and enhance customer relationships, a combination of traditional customer-facing activities and developing social media tools is used.” Through social CRM capabilities, which are unique combinations of emerging technological resources and customer-centric management systems, traditional CRM capabilities are extended by integrating the social functions and processes that emerge from firm–customer interactions and customer–customer interactions (Paliouras K. &, 2017)

CRM Dimensions

The idea of CRM is believed to be a multi-dimensional construct made up of four distinct factors or several ongoing actions, according to studies authored by Sin et al. (2005) and Yim et al. (2005). The components of this behaviour are the major focus for customers, CRM competence, Knowledge Management and CRM related technology. The researchers argued that their conclusions were consistent with the general concept of the implementation of successful CRM mainly based on people; technologies; strategy; and processes (Rashid & Tahir, 2013); however, the dimensions must interact with the strong vision to improve (Sin et al., 2005; Yim et al., 2005). Therefore, the next section will elaborate on CRM dimensions.

Customer Orientation

The ability to satisfy consumers positively influences customers’ satisfaction. Furthermore, handling consumers well keeps the service provider in advantage with customers and helps the organisation’s performance (Brown et al., 2002). Increasing long-term customer retention and creating customer loyalty are two significant aims of customer-oriented behaviours. Studies have shown that customer orientation strategy, and company performance go hand in hand (Sin et al., 2005; Zhou et al., 2009; Rashid & Tahir, 2013). Therefore, customer orientation is a fundamental and vital resource of CRM.

Studies have indicated that firms that exhibit strong customer-oriented behaviour perform better (Kim, 2008; Rashid & Tahir, 2013). This points to the necessity for companies to focus on customers, suggesting that managers should change and adapt

their organisational structure, employee measurements and rewards, and company culture (Mennens et al., 2018). Furthermore, people who work at customer-oriented firms give exceptional service. Using this reasoning, it would be beneficial for them to use a customer-oriented approach if they wish to increase their performance (Rashid & Tahir, 2013). literature has presumed that a customer-focused company will be more productive (Mennens et al., 2018; Rashid & Tahir, 2013). Thus, to adopt CRM successfully, firms must foster a customer-centric culture. This, in turn, will help to provide them with a competitive advantage.

Firm Competence

CRM implementations may be unsuccessful when an organisation lacks the competence & culture focused on long-term customer development (Dutu and Halmajan, 2011). To foster customer-oriented behaviour, firms must create an atmosphere for service in the workplace. The firm can enable competence by providing modern tools to staff members, modern technology, and skills to use, complaint tracking, and management system rewards linked with CRM and leadership to inspire (Rashid & Tahir, 2013; Mekhuma, 2020). Since these rules have been put in place, a business can help staff develop more customer-oriented employee attitudes. According to Yim et al. (2005), with a dedicated focus on customers in its CRM system, a firm should put all its efforts into building great customer relationships. Despite all this, CRM will not succeed if firms just obtain the most advanced technology and attempt to foster a customer-centred approach while keeping the project segregated from the company (Sin et al., 2005). In order to be successful with a CRM, companies must revamp their organisation structure and processes and empower everyone within the company to change. CRM data is only helpful if it is shared with all relevant departments (Mekhuma, 2020). While reflecting on these ideas, Rashid & Tahir (2013) points out that customer relationship management (CRM) success does not only demand quality technology or systems, but also service philosophy, operational procedures, and so on. Many studies show that CRM organisation is related to a company's performance (Yim et al., 2005; Rashid & Tahir, 2013; Mekhuma, 2020).

Technology and Innovation

For firms, incorporating new technologies to reduce internal expenses, connect with their surroundings, and increase overall profitability over the long term can be accomplished using current systems (ICT). In a Dutu and Halmajan (2011) article, the two professors argue that the CRM strategy can fail to meet expectations in the absence of proper use of IT. One of the most crucial opportunities lies in making good use of technology in marketing since that's the only way to get the necessary

information from the right people at the right time to make proper judgments and/or provide services (Rashid & Tahir, 2013; Mekhuma, 2020). Additionally, using CRM technology can increase the company's capacity to sustain lucrative relationships with customers by streamlining data flow, integrating and sharing information, and optimising business-customer engagement; (Rashid & Tahir, 2013). Therefore, when it comes to decreasing the failure rate, technology and innovation are crucial. Technology & innovation has to do with the rapid changes in the business world, as explained by Sirirak et al. (2011), who say that enterprises have embraced ICT as a tool for coping with the demands of fast-changing surroundings.

Knowledge Management

Customer knowledge was viewed as a crucial organisational resource in recent years. Customer knowledge transfer techniques are key resources to enhance customer relationships and build a sustainable competitive edge (Sin et al., 2005). Because of this, consumer's knowledge is an important factor in social CRM. It allows firms to acquire a competitive position in the industry (Zahay and Griffin, 2004). To provide a good customer relationship management (CRM) programme, you must convert customers information into customer knowledge (Rashid & Tahir, 2013). Knowledge must be distributed throughout the firm to be applied to meeting present customers and their future needs. Organisations that successfully leverage knowledge management tend to have a greater connection with their customers and see improvements in their performance (Sin et al., 2005; Yim et al., 2005).

The industries are transforming into knowledge-intensive businesses due to the high level of technology use and the dependent nature of service products that rely on interpersonal customer relationships. By making use of what they already know about their consumers, companies can stay competitive. This means they must also gather new knowledge about their customers, use it, and share it throughout the company. Customer retention, customer satisfaction, market efficacy, and financial performance concur with this assertion (Sin et al., 2005).

Use of Social Media Technologies

These days individuals are increasingly viewing online apps as a crucial part of their everyday lives, and they are connecting with each other, more through online platforms (Facebook, Instagram, LinkedIn, and Twitter, for example). As a result, their attitudes and behaviours regarding various forms of social media technology have improved. As a result, social media apps have been identified as one of the most successful and influential implications that have gradually been interwoven into most aspects of people's lives. In terms of consumer involvement, customer

relationship management, and communication, social media has primarily been recognised as an effective tool that complements a company's marketing aims and strategy (Alalwan et al.,2017)

Although social media marketing (also known as SMM) looks to be useful and profitable for both B2B and B2C firms, it is only recently that these interactive communication technologies have begun to be adopted and utilised in the B2B sector. Many executives lack the skills and/or competence to design SMT adoption and integration strategies in business processes, even though effective SMT (social media technologies) adoption needs a full understanding of the process's strategic and operational challenges. One of the most difficult tasks for marketers is to employ SMT to improve CRM by including customers in value co-creation and brand expansion. (Foltean et al.,2019).

P1: *“Use of Social media technologies has a positive impact on customer relationship management”.*

CRM and Customer Engagement

The thought of engagement has been studied in organisational behaviour literature to explain organisational commitment and citizenship behaviour. It has since been used to predict financial performance. Reports that a significant workforce segment is disengaged, or at least partially disengaged, from their workplace have sparked interest in the topic, leading to what some have dubbed an engagement gap. (Bowden, J. L. H. 2009).

Over the recent decade, customer interaction research has gained prominence in marketing literature. The concept's relative youth have motivated researchers to investigate its conceptualisation and operationalisation. However, its dominance is due mainly to the seemingly positive effects for businesses, such as buyer-seller interactions. (Prentice, C., Wang, X., & Loureiro, S. M. C.2019)

“Customer relationship management (CRM)” has evolved tremendously both as a plan and as a technology. Following the original technological attempts, this process has progressed significantly conceptually and in terms of applicability. This, of course, is continuing with the digital transformation in mind. In addition, today's economy has placed high importance on CRM, which may be defined as a strategy, a series of tactics, and a technology. The hardest work is where people complain the most about your work.

Conducting good customer relations is based on the idea of relationship marketing (RM). This approach is on the rise in modern marketing. The CRM concept became popular in the business world in the 1990s. As an academic investigation, it has gotten a lot of attention and caught the interest of the scientific community as well

as worldwide business. This strategy is based on the need to create a new business environment. Since everyone and everything in the twenty-first century has gone online, the Internet has had a significant impact on society, resulting in a new revolution and technology is regarded as a necessary and useful component of life. Given all of this, CRM has seen considerable interest from several different fields of information technology and marketing, as well as other fields, in the past few years.

Communicating with clients is considered as a profitable business for companies, and clients are seen in the perspective of business as precious assets (Rani Shivapasad, 2018)

The freedom of businesses to choose how they interact with their customers is at the heart of the information technology revolution, especially the “World Wide Web.” Companies may now create greater ties with clients than they could previously in the physical world thanks to the Internet. Companies today have a more substantial capacity to build, nurture, and maintain customer relationships by combining the ability to respond immediately to client demands with the ability to present the customer with a more interactive, tailored experience. More than ever before, you’ll be able to build and maintain long-term consumer relationships. These online capabilities supplement personal connections given by salespeople, customer support personnel, and call centres. (Winer, R. S.,2001)

P2: *“More utilisation of social media tools will boost customer engagement”*

Customer Engagement via Social Media Usage

Studies show that engaged customers are actively involved in designing and developing new services, generating ideas and collaborating with others, including providing their knowledge, ideas, and preference information to help the company grow (Alexander and Jaakkola, 2016; Hendriyani & Raharja, 2018). As a result, marketers can increasingly transform audiences who are just watching their brands into active players and collaborators who help create new concepts (Hendriyani & Raharja, 2018).

Consumers become creators of brand tales by participating in social media discussions about brand experiences, bringing consumers and brands together (Carlson et al., 2018). Although virtual communities have been around for the prevalence of sophisticated social networking platforms enables fast conversation initiation, widespread input gathering, and rich user content generation (Hendriyani & Raharja, 2018). Because of developments in social media marketing and text analysis tools that “listen” to and collect customer-generated content, having a thorough grasp of these processes is crucial for being able to build a competitive advantage in the market. These advancements, in turn, enable Innovation through identifying, extracting,

and leveraging customers' personal content for use in product development and promoting brand experiences and make more robust CRM (Hendriyani & Raharja, 2018; Carlson et al., 2018). In addition, they claim that it is necessary to understand website design qualities that promote interaction and cooperation between customers and entrepreneurs to foster Social CRM and share ideas among consumers.

P3: *“Increased social media activity will result in higher levels of customer engagement”.*

Customer Engagement and eWOM

When customers behave in an extraordinary way beyond simple transactions, it is referred to as “engagement”. Engagement is a multi-dimensional notion that takes into consideration the diverse interactional dynamics and experiences customers have with brands (Van Doorn et al., 2010). Engagement is defined as a psychological condition that occurs as a result of a customer's dynamic, creative interactions with a focal entity, such as a brand, according to one research stream. (Rani et al., 2021). The perception here is that being involved with eWOM activities, including participating in online brand reviews, recommendations, and referrals, constitutes active involvement (Rani & Shivaprasad, 2018; Shivaprasad & Rani, 2020). It is generated by customers' co-creation of value to both themselves and others and encourages the kind of consumer experience they desire (Gvili and Levy, 2018).

Word of mouth (WOM) activity is always regarded as a significant consumer engagement behaviour stimulus (Van Doorn et al., 2010). To establish powerful, desired brands that have devoted customer communities around them, marketers must be able to motivate customers to interact and contribute to brand-related behaviours (Gvili and Levy, 2018). Customer ties with brands and (Rani & Shivaprasad, 2019) other consumers can be translated into brand advocacy by using social networking platforms (Van Doorn et al., 2010). the perceived value of eWOM is perceived by customers to be greater than their direct experience. The perceived validity of eWOM facilitates and accelerates the communication process (Rani & Shivaprasad, 2018). Most businesses believe they should use social media marketing that consumers consider to be more trustworthy in their efforts to get customers to accept as well as share (positive) brand-related information. Thus, the brand communities are created and impact product decision-making and are therefore significant in Social CRM.

P4: *“Positive word of mouth is linked to customer participation on social media sites.”*

S-CRM Leads to Brand Loyalty

Since the mid-to-late 1990s, customer relationship management (CRM) has caught the interest of practitioners and academics as a new sort of information technology (IT) that may aid in customer management, IT development, and relational marketing in mature markets. “Customer relationship management,” or “CRM,” is a “strategic approach to improving shareholder value via the establishment of appropriate relationships with key customers and customer segments.” (Hidaka, Y., Kim, W., & Akiyama, S. -2018). It is regarded as a useful performance variable. Brand loyalty will be achieved by companies that are committed to CRM campaigns. Other research concentrated on the findings that CRM effectiveness improves over time. Consumers that are devoted to a brand are more likely to buy from them again, but the elements that cause this are unknown. A range of elements influence a consumer’s opinion of a brand, including emotive, cognitive, and conative factors. The affective component is concerned with consumers’ (positive/negative) feelings about the brand. The cognitive component is concerned with specific brand knowledge, whereas the conative component is concerned with the consumers’ behavioural inclination. (Mishra, et.al.2013).

Social media marketing has an impact on brand loyalty. The availability of information on the Internet has made it tough to connect and engage with clients. As a result, engaging, personalised, and pleasurable communication activities are required for a positive brand impact. (Laksamana, P.-2018)

P5: *“Customer engagement on social media platforms and brand loyalty are positively linked”.*

A conceptual model, according to Johnson and Henderson (2002), is a high-level depiction of how a system is constructed and operated. It describes and identifies the most essential design metaphors, as well as whether analogies were employed in the design and the system’s concepts.

The suggested conceptual model’s goal is to bring together information from a variety of sources to facilitate informed decision-making in the hotel industry when it comes to SCRM deployment. The linkages between customer relationship management, social media technology, consumer engagement, positive word-of-mouth, and brand loyalty are explained in this study. The suggested conceptual paradigm includes two components that act as accelerators of consumer interaction: CRM aspects and social media technology. Furthermore, it demonstrates the positive benefits of social media participation on word of mouth and brand loyalty. The authors examined numerous general constructs and sub-components before finalising the basic components of this approach. The conceptual model was built by

systematically collecting concepts from many topics into common themes, as well as the evolution of significant theoretical notions over time, as well as changes in knowledge and new results. As a result, the conceptual model may aid practitioners in contextualising their decisions, highlighting critical issues that must be addressed, and investigating the impact of SCRM capabilities on customer engagement and relationship performance outcomes such as positive word of mouth and referrals.

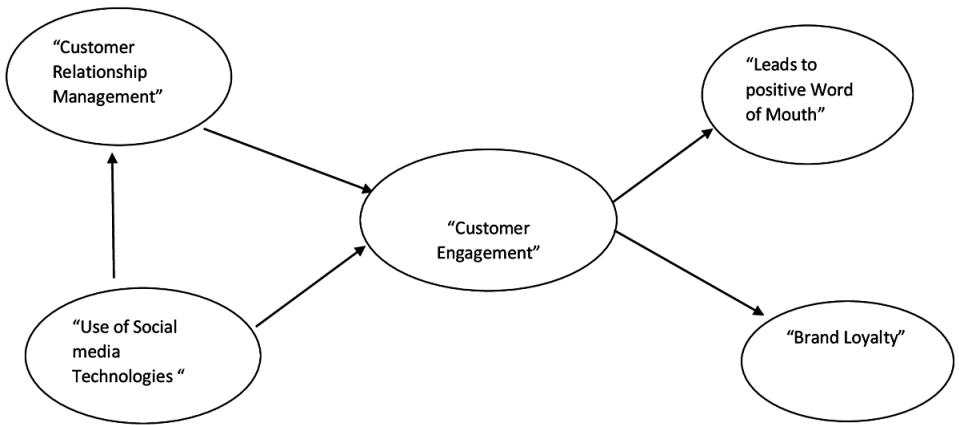
The study shows how the interaction between customer relationship management and social media technology leads to customer engagement, which leads to positive word of mouth and brand loyalty (see Figure 1).

In the suggested conceptual paradigm, CRM aspects and social media technologies are two constructs that work as enablers of customer connection. Positive word of mouth and brand loyalty are also shown to be outcomes of social media participation.

Companies can use social media platforms to interact and communicate with both current and potential customers. Customer participation leads to value co-creation, which can affect customer relationship outcomes such as brand loyalty and advocacy. The marketing communication environment is changing, as are the attitudes of more empowered digital consumers. This model has been tweaked to consider changes in consumer behaviour as well as market demands.

CONCEPTUAL FRAMEWORK OF SOCIAL CRM

Figure 1. Proposed social customer relationship management framework



Implications of Chapter

The proposed chapter would seek to bring together a diverse set of characteristics and research viewpoints on Social Customer Relationship Management. It will assist in comprehending that customer are co-creators of value and demands in all products and services, as well as how information and communication technologies are used to collect and analyse customer data to better understand the customer; it will also assist in comprehending how to develop customer touchpoints that are not only aimed at selling but primarily a customer experience. (Sigala, 2018).

The research will also reveal how Social CRM is aiding in the customer-organization relationship. A customer relationship management software that includes social media gives the organisation the same degree of insight as traditional channels, plus the flexibility to communicate internally using social media tools. Using standard tools, dashboards, and metrics, one can monitor, track, and benchmark the social media communications. The shift from CRM, which is based on a strategy centred on customer transactions, to Social CRM, which is centred on building interaction between the customer and the firm, has been enabled by the emergence of Web 2.0 technologies (Low, K. C. P., & Anshari, M. (2013). “Customer relationship management”, supported by a sophisticated technical solution for business administration such as Customer Relationship Management (CRM), is critical for business success in today’s dynamic, changing industry. Because of the influence of its deployment on the return on investment, it has shown to be one of the fastest-growing technology solutions. (Navarro, V., Gil-Gomez, H., Oltra-Badenes, R., & Sendra-García, J. (2021)

Companies must take a holistic approach to organisational change and revolutionise employee mindsets to realise the potential of CRM in social media fully. This study makes a significant contribution to emerging social CRM literature by identifying Innovation, technology and customer connection capacity as key variables in the social CRM process.

Identifying this key component adds to our understanding of building and implementing a social CRM strategy in the hotel business.

The multiple dimensions of CRM that are Customer Orientation, Firm Competence, Knowledge Management, and Innovation & Technology in CRM is linked to various performance perspectives like economic growth, consumer satisfaction, internal business, and learning and development industrywide. The highly competitive industry like hospitality, travel, luxury products, etc. can use these insights to boost their performance and assure their long-term survival. When managers think strategically about CRM, they should look at corporate structure and culture, personnel capabilities, and technology to build long-term relationships with customers. In addition, using only CRM technology probably will not boost the

learning and growth performance of the business. However, the more one interacts with the various components of CRM, the more effective they will be. Therefore, managers should take this information into account while designing their CRM system. Social CRM helps a lot in building brand Loyalty. These days customers are well connected with service providers, everything is being communicated.

STRATEGIES FOR ACHIEVING SUCCESS OF SOCIAL CRM

Respond to Customer Queries Promptly

In order to have a successful SCRM, the organisation should respond to their queries at the earliest, because if a delay happens, it will lead to negative word of mouth.

Use Social Incentive to Encourage Brand Loyalty

The company's social media followers, who are the most loyal, loud, and active, are valuable assets. Developing relationships with these devoted consumers and individuals with the most social clout can aid in the transformation of the online presence into communities.

Analytics Helps an Organisation to Boost Social CRM

Once it is identified a particular customer, analytics can help the business learn more about them. Analytics could be the key to a customer conversion if it sends a user's profile and specific facts about them through the CRM pipeline to marketing or salesperson at the organisation.

Keep It Personal

Social CRM is not meant to be a generic venue for advertising content. Instead, it is an opportunity to add a personal touch to specific articles and influencers. Focus on direct communications and comments rather than marketing.

Train People

Involving both sales and customer service professionals in the process is critical to a successful social CRM strategy. Training the social media team to think like customer care representatives and the brand voice will soar.

Contribution to Book and Originality of Chapter

In the current scenario where we are leading towards Web 4.0, where we are more focused on customer engagement and getting more connected with customers via various new technologies, firms still need Social-CRM to connect with customers. The influence of Marketing 4.0 on customer satisfaction and purchase intent is more. Marketing 4.0, which replaces Marketing 3.0 and 2.0, strives to incorporate the impact of brand interaction in the digital age. (Dash, G., Kiefer, K., & Paul, J. -2021). The chapter will access the valuable information of Social-CRM and its contribution to Web 4.0. A complete understating of Social-CRM will help the firms to strategies the actions to reach out to customers. To put it another way, the chapter will assist scholars in comprehending how Social-CRM will contribute to Web 4.0, which focuses on customer interaction using various technologies.

CONCLUSION

After conducting an extensive review of CRM concepts and literature on social media marketing, the study proposes an integrated conceptual model that merges CRM effectiveness dimensions with social media technologies to generate engagement, which is a critical component for achieving financial performance in the form of brand loyalty. Marketing professionals can assess their current CRM and online marketing strategy by looking at their customer orientation management process, firm competence in terms of working environment, knowledge management processes, and technology-based CRM and identifying pitfalls before investing resources in new CRM. Plan 2.0. These days, customers are not passive customers who interact and look onto the information available on the Internet and then buy a product or service. Social media technologies have really empowered customers a lot, the further customer interacts with service providers and narrates their experience, which further leads in making of a better experience. Social CRM has also helped in engaging customers more, which further leads to brand loyalty. Co-creation of unique service experiences can result in favourable word of mouth, lowering marketing costs while increasing income. Furthermore, brand promotion in the form of electronic word of mouth can build trust and confidence.

Because engaged customers are less inclined to take risks and have a greater lifetime value, all firms aspire to have loyal customers who emotionally connect to their brand. On the other hand, negative word of mouth is an important construct that this paradigm ignores. Customer-brand partnerships on social media platforms don't always provide positive results.

This research gives a comprehensive methodology that will assist businesses in making more informed decisions when implementing Social CRM initiatives.

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Chapter 12

Social Network Customer Relationship Management for Orchestras: A Case Study on Hong Kong Philharmonic Orchestra


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ABSTRACT

The COVID-19 pandemic and quarantine policies have caused the Hong Kong Philharmonic Orchestra (HKPhil) to significantly reduce offline concerts and ticket revenue, while increasing reliance on government funding. With the advancement of internet and mobile technologies, social media greatly help disseminate information and connect to customers. Thus, this study investigates HKPhil's social customer relationship management (CRM) by surveying its website and social media. Quesenbery's 5Es usability model was used to analyze the orchestra's social media usability and the 7Ps marketing mix model to explore the current opportunities and risks faced by HKPhil. The findings indicate the limitations of HKPhil's current approach to social CRM and suggest changing concert formats, enhancing social network promotions, and providing online education resources to help HKPhil attract a wider audience of different age groups. Scant studies focus on orchestras in East Asia, and this study offers some social CRM development strategies and actionable recommendations.

DOI: 10.4018/978-1-7998-9553-4.ch012

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INTRODUCTION

Modern orchestras are experiencing various challenges and opportunities in their development as the digital age arrives and corresponding adjustments in their operations are necessary (Sigurjonsson, 2010; Yu, Chiu, & Chan, 2022). Unlike popular arts that attract broad public interest, orchestras promote classical music, representing society's top aesthetic taste with a smaller audience (Hauser, 1999). Recent common problems include fewer offline concerts, online performances, and video viewing, causing over-reliance on government funding (Chandler, 2019). Also, a highly homogenized performance market leaves less room for regional orchestras and a lukewarm attitude toward orchestral music among the younger generation (Erica, 2021). As a result, orchestras have recently started to use social media to attract the younger generation and reach a broader audience with various interests and needs to promote classical music.

The orchestra selected for this case study is the Hong Kong Philharmonic Orchestra (HKPhil), the most funded Hong Kong orchestra by the Hong Kong Government (Annual report, 2021). This study evaluates the orchestra's social media and website to recommend more substantial social media strategies for developing customer relationship management (CRM). HKPhil was established in 1947 and was previously known as the Chung Ying Orchestra. As the orchestra grew, it became independent in 1957 and was renamed the Hong Kong Philharmonic Orchestra, and then professionalized in 1974 (Smith, 2008). HKPhil is a non-profit organization supported by the Hong Kong government and other sponsors (HKPhil, 2021). According to the HKPhil's website, HKPhil was the first orchestra from Asia to win the prestigious *Gramophone Orchestra of the Year Award* in 2019. Besides, HKPhil is dedicated to developing local talent through various educational and outreach programs (HKPhil, 2020).

This study aims to use the 5Es usability model (Quesenbery, 2001) and 7Ps marketing mix model to examine the HKPhil's social media marketing behavior, identify its existing strengths and shortcomings in CRM, and give recommendations to assist HKPhil in improving its social media usability and CRM development strategies.

LITERATURE REVIEW

Social Network Marketing for Orchestra

Classical music contains a wealth of cultural and spiritual value, and listeners must be familiar with both classical music and culture and history to appreciate it (Chandler,

2019). Because music education in Hong Kong is somewhat low compared to other parts of the world, the populace lacks the musical literacy necessary to appreciate Western classical music (Ho, 2006). The difficulty for orchestras to market themselves through social media is that the public's love for classical music is generally low (Hauser, 1999), especially in East Asia (Ho, 2006). As a result, expanding the user base to cash in after marketing is challenging. Social media is not conducive to marketing the classical genre because of the low barrier to entry, the different user bases and operating methods of each platform, and the instability of traffic, as the classical genre is a relatively unique audience (Tuten & Solomon, 2015; McKenzie et al., 2020; Yu, Chiu, & Chan, 2022). Classical music will be relatively inefficient in the realization of social media, especially for the younger generation (Erica, 2021).

According to Rafiq & Ahmed's definition (1995), the 4Ps marketing hybrid concept has been criticized for too limited and straightforward. The 7Ps approach expands on the 4Ps framework and is widely accepted in the marketing field for its comprehensive nature (Rafiq & Ahmed, 1995; Ivy, 2008). The 7P's of marketing include product, price, promotion, place, people, process, and physical evidence (Gheorghe & Polixenia, 2018). The 7Ps marketing mix model assists users in developing a solid marketing mix and translating marketing strategy into improved sales and successful marketing campaigns (Pantano et al., 2019).

User Experience in Social Media

With the development of mobile Internet technologies, social media has become an integral part of the user experience (Ni et al., 2021; Cheng et al., 2020; Fong et al., 2020). In particular, social media offers access to music content and information anytime, anywhere, and the younger generation has changed their habits in information search and content consumption (Yu et al., 2021; Lau et al., 2020; Dong et al., 2021). However, users often switch between multiple social media channels and use them for different purposes (Tsang & Chiu, 2022; Lam et al., 2019). According to Erica (2021), many orchestra websites do not pay good attention to social media operations, such as customer service without immediate response, fewer promotional videos, and comment message interaction. Besana & Esposito (2019) mentioned that the role of a website is to bring together social media communication content. Also, social media can be an excellent way to drive traffic to a website, and orchestras need to think about retaining users and turning that traffic into revenue (Goyal & Kar, 2019; Al Qudah et al., 2020).

According to Al Qudah et al. (2020), user experience requires an analysis of users' usability needs. The dimensions of usability can be analyzed using the 5Es usability model, including five dimensions: effective, efficient, engaging, error-tolerant, and ease of learning (Quesenberry, 2001). Each dimension has equal importance, and

by thinking about the value usability brings, it can be used in user research and improve the products or services. Besides, due to classical music culture, user sticky marketing strategies are not always applicable (Crawford et al., 2014). However, social media can be effective in audience development efforts and can enhance the engagement of the online public, especially music learners and teachers (Huang et al., 2018; Lei et al., 2021).

Online Marketing and CRM

Social media has a much larger reach and is less expensive to spread than traditional channels (Ni et al., 2021). According to HKPhil's (2021) annual report, HKPhil's official website was voted the best music website in 2020, with more than 80 online programs and 1,500,000 online views, showing the number of online views already more significant than the number of offline concert viewers. Social media allows for widespread exposure, precise targeting of customer segments for marketing, and sales conversion through Big Data (Zhu & Chen, 2015).

At present, Hong Kong orchestras are primarily promoted through metro billboards and offline posters, with little social media marketing and visibility (Chandler, 2019; Erica, 2021). Sales conversion necessitates an examination of customers' purchasing habits. Orchestras must increase their awareness of each social platform's user base to adapt their social advertising and prevent expenditure wastage (Li et al., 2020).

Research Gap and Methodology

A literature review reveals scant studies on orchestras' marketing, particularly applying the 5Es and 7Ps models. So this study can illustrate the methodology of such applications together and provide a basis for subsequent research on how classical music can be better promoted in the mobile Internet age. This study addresses such research gaps through a case study on HKPhil, the oldest orchestra in Hong Kong (Annual report, 2015). Therefore, it has high visibility and representation and a good audience base for social media marketing research.

This study adopts a media examination approach through the HKPhil's official website, annual reports, and related literature. The collected information is analyzed through the 5Es and 7Ps models to develop a suitable social media marketing strategy for the orchestra.

THE 5Es MODEL ANALYSIS OF SOCIAL MEDIA USABILITY FOR ORCHESTRAS

The 5Es model is primarily used to analyze the user experience and the usability of a product or service. The 5Es model has five dimensions of usability, including effective, efficient, engaging, error-tolerant, and ease of learning (Quesenbery, 2001). This study analyzes HKPhil's current social media usability to summarize its strengths and weaknesses for making targeted marketing recommendations.

Effective

Effectiveness refers to the ability of HKPhil's social media accounts to help users achieve their goals accurately, such as watching online programs and accessing orchestra information (Quesenbery, 2001; Belanche et al., 2012). Taking HKPhil's YouTube account as an example, the channel currently has around 10,000 subscribers and a total of 15,303,314 views. According to the information displayed on the channel, the channel has created ten playlists, with an average of 1,000 to 3,000 video views. The videos are mainly clips of musicians playing, interviews with musicians, and recital videos. In addition, the frequency of video uploads by the HKPhil is around once a week, which is not quite frequent. This shows that HKPhil does not run its Youtube channel very well, and there is little information on the channel to promote recent events, though the total number of views on the whole channel is still substantial. As a result, HKPhil's social media platforms failed to meet users' requirements for up-to-date information on events, and the effectiveness of social media was low. More attractive content is thus necessary (Fong et al., 2020; Chen et al., 2020).

Easy to Learn

Ease of learning refers to the ability of users to quickly learn and use the features of these marketing platforms (Lee & Kozar, 2012). Except for HKPhil's official website, all other promotional accounts are built on existing social media, such as Instagram and WeChat (HKPhil, 2021). As using popular social media is generally considered easy, this study investigated HKPhil's official website. The findings indicated that the official website is well-informed, with a functional partition linking all social media together. Users can jump to the corresponding social media pages with the click of a button. Thus, HKPhil's social media performs well in terms of ease of learning.

Error Tolerant

Error tolerance refers to the extent to which social media pages prevent errors and how quickly they help users recover from them (Palmer, 2002). Currently, the only function on HKPhil's website that requires users to enter their personal information is "Instant Ticketing," which allows users to order tickets on the official website through the URB TIX website or its mobile ticketing application *My URB TIX* (<https://www.hkphil.org/what-s-on/tickets/order-now>). However, there are no refunds for online and mobile ticketing applications, and the error tolerance rate is considered relatively low (Fung et al., 2016).

Efficient

Efficiency is a more subjective judgment and is usually judged by the speed of customer service response and the time it takes to get the information you need (Ani et al., 2019). HKPhil provides three main ways of contacting customer service on social media: email, phone, and comment messages. In November, this study sent an email to HKPhil's customer service email address and did not receive any response. While the customer service phone number can be reached during working hours, customer service rarely responds to comment messages. There are also not many responses and conversions on their Youtube or Facebook accounts. Thus, HKPhil is inefficient in terms of customer service response speed. Yet, regarding the efficiency in providing users' required information, HKPhil's official website provides a clear schedule of events and activities. In contrast, the information on social media platforms is not updated on time, and users need to click on the website URL from HKPhil's social media to access relevant information.

Engaging

Engagement is defined as the level of satisfaction and interest that a social media account page brings to the user. According to Goyal & Kar (2019), an attractive interface increases the number of clicks from users. The content and quality of videos and images determine the level of attractiveness of a social media account.

Referring to HKPhil's Instagram, the posts feature posters and short videos that quickly grab users' attention, which is especially welcomed by the younger generation (Lam et al., 2022; Chan et al., 2020). However, it is worth noting that most of the posts are classical music concert clips, which may only attract a specific group of classical music lovers and perhaps cannot contribute to expanding its user or fan base. To attract more users, HKPhil should push more interesting instructional posts

such as how to enjoy classical music or more popular pieces to help users who do not understand classical music learn to appreciate it (Lam et al., 2022).

7Ps MARKETING MIX MODEL ANALYSIS OF SOCIAL MEDIA MARKETING

Product

Products are at the heart of the marketing mix and are divided into tangible and intangible products (Njegomir & Rihter-Demko, 2018). In HKPhil's social media, tangible products include videos, pictures, and event promotions posted by HKPhil. Intangible products are services and ideas, such as classical music appreciation teaching and customer services. HKPhil's products are mainly recital videos, and orchestra members describe the limitations of these classical music products in terms of engaging users. Suryaningsih & Nohong (2019) points out that the audience for classical music is a tiny one, as appreciating classical music requires an understanding of its cultural and compositional context to listen to it. The majority of the public in Hong Kong is currently not interested in classical music, resulting in social media marketing not being very effective in expanding the user base.

HKPhil currently provides regular school performances and adult education to overcome this problem. According to HKPhil's (2021) annual report, school performances include in-school performances and instructional workshops with a total attendance of 543; adult education is the Swire Music Appreciation Concerts with an audience of 625. Both events aim to teach students and adults how to appreciate classical music. However, the figures show that the number of participants in these events is minimal compared to the Hong Kong population. Such meager attendance is probably due to offline events, limited seats and space, and the ineffective spread of classical music knowledge (Chandler, 2019). Therefore, HKPhil should launch relevant classical music teaching activities on social media to promote classical music in general and promote such information to schools as outreach activities to increase the classical music literacy level of the younger generation (Tse et al., 2022).

Price

There are several factors to consider when pricing a product, including market pricing, costs, and what customers are willing to pay (Singh et al., 2013). Price is an essential factor in the marketing mix, and price largely influences consumers' willingness to buy a product (Hanaysha, 2017). Many products have membership policies that offer price discounts to members to build a long-term stable customer base to increase

user loyalty. At the same time, establishing a membership system also allows for identifying user needs and precise marketing, thus significantly reducing customer acquisition costs (Wieseke et al., 2014). However, HKPhil currently does not have an effective membership marketing system, and customers purchase tickets on the ticketing apps or ULTRIX platform, which cannot attract the target customer base to buy tickets on a long-term basis.

In addition, tickets for recitals are not expensive compared to pop concerts, and sometimes free performances are available on social media. Free performances attract many users of all ages to watch, but if they are not interested in the content of the performance, users may quickly close the video (Erica, 2021). Launching knowledgeable paid videos is an effective way to boost the audience's benefit from free shows. In a knowledge-based video, HKPhil can provide teaching resources for users interested in learning more about classical music, expanding its customer base, and generating revenue simultaneously (Lei et al., 2021).

Promotion

Promotion is a series of communication activities to encourage consumers to buy a product and includes advertising, direct marketing, and social media promotions (Lewis, 2004). Hanaysha (2017) suggests that digital promotion is very diverse and can include social media groups, live streaming, and online events. HKPhil's promotions are mainly offline advertising, with fewer views of online promotional posters (e.g., only 88 likes on the Instagram poster for the recital). Therefore, HKPhil needs to increase the diversity of its promotional formats, such as regular online live streams, where renowned performers are invited to answer audience questions and perform their repertoire online.

In addition, creating a positive image of the orchestra can also bring positive benefits to promotions (Huang et al., 2018). HKPhil has seven social media channels, each of which has a different frequency of posting information at a lower frequency. To enhance the orchestra's exposure on social media platforms, the frequency of information posting should be increased to several times a week to attract more user traffic.

Place

Place refers to the ease with which consumers can find and purchase products from social media (Lewis, 2004). HKPhil has created a detailed product category on the official website to quickly find the information and products they need. Among other things, concert tickets are provided through ticketing agents, and users can choose to purchase tickets offline or online. Recital CDs and teaching materials are sold

on other websites such as Schott Music (<https://en.schott-music.com>) and Naxos Records (<https://www.naxos.com>).

People

People in the 7Ps marketing mix refers to the people in the organization (Rafiq & Ahmed, 1995). As an orchestra, the orchestra's well-known conductors and performers influence consumers' perceptions of the orchestra and their willingness to purchase tickets to attend a concert. Therefore, the official website of HKPhil clearly lists the music directors, principal guest conductors, and performers of the orchestra. These well-known musicians can attract audiences who love their music to come and listen to the concerts (Sigurjonsson, 2010). However, HKPhil's social media focus more on the performances, musical pieces, and events than on its people.

Process

Processes refer to how products or services are delivered to consumers and remain efficient and reliable (Gheorghe & Polixenia, 2018). With the rise of online shopping, digital partnerships and social media platforms are an essential part of the marketing mix. HKPhil (2015) has two main products: concert tickets and classical music publications. Through the links on HKPhil's website, users can get information on ticketing and choose to purchase tickets in person at offline ticketing outlets or using mobile ticketing software.

On the other hand, the website lists the types of publications but does not provide links to purchases and prices. Thus, users have to search for their purchase options, which is less efficient. Worse still, HKPhil does not place links to purchase tickets and publications on its social media. Shopping through social media, such as online shops, is already a prominent shopping method in today's online era, especially for the younger generation (Mariana et al., 2018; Ni et al., 2021).

Physical Evidence

Physical evidence includes a wide range of concepts and entities, including branding, offline concert venues, and the presentation of products on websites and social media (Ivy, 2008). Physical evidence influences users' perceptions of the quality of products and services, affecting their desire to buy and their satisfaction with the product (Belanche et al., 2012). HKPhil (2020) is one of the leading orchestras in Hong Kong and has a high international reputation. HKPhil's conductors and musicians have won awards internationally and have an overwhelming strength and reputation, and these accolades form an integral part of HKPhil's physical evidence. HKPhil's

fame raises the level of audience expectation for the orchestra's performances, and in marketing, brand fame is an essential factor in promotional success (Erica, 2021).

In addition, HKPhil has an official website and seven social media accounts, providing the latest news on all major social media accounts to give users confidence in the reliability of the orchestra's performances and products (Smith, 2008; Lam et al., 2022). At the same time, HKPhil (2021) is funded by the government and several significant corporate sponsors, with good funding sources and guarantees of integrity so that customers can buy the orchestra's services and products with confidence.

SUGGESTIONS AND CONCLUSION

Based on the analysis results of the 5Es usability and 7Ps marketing mix models, this study has analyzed HKPhil's limitations and shortcomings in its social media marketing. Therefore, summarizing the suggestions made above, two strategic directions are recommended to enhance its marketing and CRM capabilities on social media.

Expanding Online Channels to Provide More Online Performances and Recordings

Recently, impacted by the COVID-19 pandemic, most performance venues have been closed, and many concerts and outreach activities had to be canceled (Yu, Lam, & Chiu, 2022; Huang et al., 2021; 2022). Travel and quarantine restrictions made performing with international and mainland Chinese soloists and conductors extremely difficult. Facing the epidemic, HKPhil needs to take a combination of online and offline approaches currently and perhaps also in the future. In particular, with the current digitalization trends, increasing online performances and recordings on social media not only provides more choices for audiences but also contributes to the preservation of musical culture (Mak et al., 2022; Sun et al., 2022).

Provide More Classical Music Educational Content

Adding and modifying products is the primary requirement to expand the user base. Many people are not interested in classical music because they do not understand it and cannot empathize with the performances. The products (mainly concert tickets and sold media) should be accompanied by extra educational components on social media, such as videos on classical music appreciation, interesting classical music facts and history, regular news updates, and classical music culture (Lei et al., 2021). HKPhil's user base can be expanded by educating the public and creating a demand

for classical music. Further, such education content can contribute to classical music education aids and for discussions and practice of community of practice on social media comprising music teachers and students (Lei et al., 2021; Leung et al., 2022).

Launching a Paid Knowledge Channel

Due to the specific nature of classical music, the target customer base is more confined and, therefore, very suitable for knowledge payment-related marketing (Zhang et al., 2020). Paid knowledge marketing on social media can include videos and illustrations of classical music knowledge and history and culture, broadcast live or recorded to spread knowledge and cash in on the social media customer base (Su et al., 2019). At the same time, paying for knowledge can provide teaching resources for users who do not know about classical music but want to learn. Users who learn about classical music will be more willing to buy concert tickets, thus expanding HKPhil's customer base and improving their classical music literacy.

Fostering Discussion on Social Media to Improve the Audience's Music Experience

Social website interactivity influenced price premium and buying intentions through music experience and music choice (Yu, Chiu, & Chan, 2022). Enhancing social networking is a good way to improve the music experience because music is a source of peace, healing, and unity. People are likely to generate emotions, and they are willing to share them with others. Building its music community can attract more music lovers to participate and strengthen their understanding of music (Lei et al., 2021).

Browsing HKPhil on Facebook shows very few discussions, reflecting a low level of interaction between HKPhil and its audience. Therefore, various discussion groups about HKPhil should be set up to increase the topic. HKPhil can educate its audience and provide listening and viewing suggestions, like recent virtual reference services offered by libraries (Tsang & Chiu, 2022). Under the COVID-19 lockdown, as many concerts cannot occur (Yu, Lam, & Chiu, 2022), HKPhil can foster discussion and suggestions on social media to arouse the audience's interest in listening to or watching their different online performances and recording.

Using Data Analysis Tools for Social Media Platforms

By analyzing the usage data on different social media platforms, HKPhil can better determine the dynamic trend of the audience's interest and needs to amplify the impact of social media marketing and CRM strategies (Deng & Chiu, 2022). Such

analysis can help better understand social media marketing and CRM effectiveness, such as posts, content, products, concerts, outreach activities, online recordings, and audience feedback. For example, Facebook Analytics is Facebook's built-in analytics engine that helps collect and analyze post-related parameters. These metrics can provide valuable information such as page views, peak page views, and visiting demographics, which can be transformed into marketing and CRM reports for enhancing marketing strategy strategies on social media (Deng & Chiu, 2022; Chan & Chiu, 2022). HKPhil and its products can also increase their reach by updating posts automatically.

Innovation by Integrating More Oriental Elements

HKPhil is a long-established international orchestra with a combination of Chinese and Western cultures. With China being one of the earliest ancient civilizations, Chinese culture is unique and exerts profound influence worldwide. In addition, Chinese music, dance, literature, martial arts, and visual arts have a global influence. Thus, following the successful strategies of many recent online games, new compositions and arrangements sponsored or commissioned by HKPhil can include more oriental cultural elements that further enhance its uniqueness and audience attraction worldwide (He et al., 2022). HKPhil can also cooperate with such games in providing background music and events advertisement.

Final Comments and Future Work

Developing an effective marketing strategy is not straightforward, even for a well-funded classical orchestra. These orchestras still need to adapt their marketing strategies to meet the challenges and opportunities of the contemporary knowledge-based globalized economy, especially under the COVID-19 pandemic (Yu, Chiu, & Chan, 2022). The marketing strategies proposed in this study can help orchestras to expand their user base and enhance their long-term revenue with social media, and provide the foundation to support subsequent in-depth research. HKPhil should also consider future analytics and automation for customer relationship management (Chan & Chiu, 2022).

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KEY TERMS AND DEFINITIONS

5Es Usability Model: A model for analyzing the usability of products and services, including five dimensions: effective, efficient, engaging, error-tolerant, and ease of learning. Each dimension has equal importance, and by thinking about the value usability brings, it can be used in user research and improve the products or services.

7Ps Marketing Mix Model: A widely accepted model in the marketing field for its comprehensive nature, including product, price, promotion, place, people, process, and physical evidence. It assists users in developing a solid marketing mix and translating marketing strategy into improved sales and successful marketing campaigns.

COVID-19 (Coronavirus Disease 2019): A contagious disease caused by a virus called the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019, and the disease spread worldwide, leading to the COVID-19 pandemic.

Customer Relationship Management: A combination of practices, strategies, and technologies for organizations to manage and analyze customer interactions and data throughout the customer lifecycle, aiming to improve customer service relationships and assist in customer retention and increase sales revenue.

Digitalization: A process of moving the libraries to provide services digitally, using digital technologies to alter the mode of library services and enhance the quality of services to users in the case of libraries.

Hong Kong Philharmonic Orchestra (HKPhil): The most funded Hong Kong orchestra by the Hong Kong Government was established in 1947. HKPhil was the first orchestra from Asia to win the prestigious *Gramophone Orchestra of the Year Award* in 2019.

Social Media: Interactive network technologies and digital channels that facilitate the creating and sharing of information, ideas, interests, images, videos, links, and other information.

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