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**ASSOCIAÇÃO DE POLITÉCNICOS DO NORTE (APNOR)**  
**INSTITUTO POLITÉCNICO DE BRAGANÇA**

**Innovation Management in Business: How Digital Management is  
Used to Increase the Firm Reputation and Customer Response**

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Final Dissertation submitted to *Instituto Politécnico de Bragança*

To obtain the Master Degree in Management, Specialisation in Business  
Management

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***Bragança, December 2022.***



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## Abstract

The current study has been designed to study the concept of innovation management. As digitalization is the biggest creation of innovation, its role in improving or affecting the firm's reputation and customer response is analysed. The study's objectives were to analyse how digitalization affects firm reputation and how it has been used to improve customer response service. The study was focused on analysing the data from inside the organization. Mixed method research methodology was utilized to collect both quantitative and qualitative data. Both questionnaire and qualitative open-ended interview were utilized for the collection of data. The research sample consist 50 employees and 10 managers from five manufacturing companies. The questionnaire was filled by employees and interview was conducted with managers. For quantitative analysis frequency distribution and percentage analysis, Pearson coefficient correlation analysis and linear regression were applied. Strong positive correlation was found between digitalization and variables of customer care with values obtained as Service Frequency ( $r=.866$ ), Reliability ( $r=.841$ ) and Convenience ( $r=.890$ ). Similarly, strong positive correlation was also found between the digitalization and variables of firm reputation. The values obtained were Product Innovation ( $r=.795$ ), Corporate Culture ( $r=.881$ ), Firm Performance ( $r=.907$ ) and Product Value ( $r=.881$ ). Linear Regression was applied to test the hypotheses and to check the impact of independent variables on the dependent variable. For firm reputation, the regression analysis indicated that digitalization positively impacts firm performance, product value and corporate culture. For customer response variables regression analysis indicates that digitalization has positive impact on convenience and service frequency offered by customer care. On the other hand, regression analysis indicated that digitalization has no impact on the reliability of customer care services. Thematic analysis was applied to the qualitative data gathered from the managers of the selected companies. The results indicated that all the managers believed in the potential of digitalization in improving firm reputation and customer care service. However, managers mentioned limitations like meeting shareholder expectations, budget constraints, and the investment required for training and development. Digitalization was not found to be utilized for product innovation. The study recommended that provided the scope and benefits of digitalization in all aspects of businesses, organizations must carefully design their digital strategies and allocate more budget to digital activities

**Keywords:** Digitalization, Firm reputation, Customer Care, Digital Strategies, Innovation.

## Resumo

O presente estudo foi desenhado para analisar o conceito de gestão da inovação. Como a digitalização é a maior criação de inovação, analisou-se o seu papel em como melhorar ou afetar a reputação da empresa e a resposta do cliente. Os objetivos do estudo assentaram em analisar como a digitalização afeta a reputação da empresa e como esta tem sido usada para melhorar o atendimento ao cliente. O estudo centrou-se em analisar os dados dentro da organização. Recorreu-se a uma metodologia de método misto para recolher dados quantitativos e qualitativos. Tanto o questionário quanto a entrevista qualitativa aberta foram utilizados para a recolha de dados. A amostra final compreendeu 50 funcionários e 10 gestores de cinco empresas. O questionário foi preenchido pelos trabalhadores e foram realizadas entrevistas com os gestores. Na análise quantitativa, utilizou-se a técnica descritiva exploratória, a análise de correlação e a regressão linear. Foi encontrada uma forte correlação positiva e direta entre a digitalização e as variáveis de atendimento com valores obtidos como Frequência de Atendimento ( $r=.866$ ), Confiabilidade ( $r=.841$ ) e Conveniência ( $r=.890$ ). Da mesma forma, também foi encontrada uma forte correlação positiva entre a digitalização e as variáveis de reputação da empresa. Os valores obtidos foram Inovação do Produto ( $r=.795$ ), Cultura Corporativa ( $r=.881$ ), Desempenho da Empresa ( $r=.907$ ) e Valor do Produto ( $r=.881$ ). A regressão linear foi aplicada para testar as hipóteses formuladas e verificar o impacto das variáveis independentes na variável dependente. A análise de regressão indicou que a digitalização tem um impacto positivo no desempenho da empresa, valor do produto e cultura corporativa. Por outro lado, para inovação de produto o valor de prova obtido foi superior a 0.05 (nível de significância), concluindo-se que a digitalização não tem impacto na inovação de produto. Para as variáveis de resposta ao cliente, a análise de regressão indica que a digitalização tem impacto positivo na conveniência e na frequência do serviço oferecido pelo atendimento ao cliente. Por outro lado, a análise de regressão indicou que a digitalização não tem impacto na confiabilidade dos serviços de atendimento ao cliente. A análise de conteúdo foi aplicada aos dados qualitativos recolhidos junto aos gestores das empresas selecionadas. Os resultados indicaram que todos os gestores acreditam no potencial da digitalização para melhorar a reputação da empresa e o atendimento ao cliente. Porém, limitações como atender às expectativas dos acionistas, restrições orçamentais e esforços e investimentos necessários para treinamento e desenvolvimento foram mencionados pelos gestores. A digitalização não foi utilizada para inovação de produtos. O estudo recomendou que, considerando o escopo e os benefícios da digitalização em todos os aspectos dos negócios, as organizações devem projetar cuidadosamente as suas estratégias digitais e alocar mais orçamento para atividades digitais.

**Palavras-chave:** Digitalização, Reputação da empresa, Atendimento ao cliente, Estratégias digitais, Inovação.

## **Acknowledgement**

First of all, I like to thank God for all his blessings that I have been able to successfully complete my research work. It has indeed been a very hard very learning and meaningful experience for me.

Secondly, I like to express my deep gratitude to both my research supervisors Miss Ana Sofia Cardim Barata and Miss Paula Odete Fernandes for their continuous support and guidance. Their insight, vision and sincerity had greatly motivated me and I was able overcome my shortcomings and was able to grow both as a student and person as well. Their help was extremely important as I was unable to successfully conduct my analysis but they guided me at every step.

I also want to thank my friends and colleagues and some of my respected seniors who were also there to guide and help me out whenever I felt struck. In the end, I would definitely mention my parents and family back in Pakistan. Their constant support and prayers were the reason that I am able to continue and complete my degree program.

## Acronyms

BM	Business Model
BMI	Business Model Innovation
BVS	Biometric Verification System
CC	Corporate Culture
CRM	Customer Relationship Management
CV	Convenience
F	Frequency
FP	Financial Performance
L	Linear Regression
PV	Product Value
$r$	Correlation Coefficient
RB	Reliability
R&D	Research and Development
SF	Service Frequency
SMS	Small Message Service
TIM	Total Innovation Management

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## Introduction

The 21<sup>st</sup> Century marked the accelerated development in innovation, and the essential feature is the development of digital technologies. Digital technologies have made the business environment unpredictable and turbulent, which promises prosperity and creates uncertainty for the continuation of businesses. In order to survive in this competitive, innovative business environment, any business needs to be adaptable and flexible in the changing and progressive business environment. Adaptability and flexibility are not only the challenges for businesses today; they face problems like tougher competition, increased customer awareness, new business strategies, innovation adaptability and more convenient and convincing ways to cooperate and communicate with their shareholders. The penetration and rapid development of digital technologies in the business process and society have also made organizations rethink and explore new methods through which digital technologies can effectively improve all aspects of businesses, especially productivity and quality of products. The emerging concept of digital transformation has been proving itself to be not one of the possible solutions but essential for the organizations for the expansion and excellence of their business. Today, innovation is central to designing any new or competitive business model. However, innovation alone is not necessary to guarantee market position and performance success. It must be accompanied by active guidance and leadership to integrate modern digital technologies in organizational structure, culture, processes, changing products and the business model as a whole. The main focus of all the innovative activities must be the optimal satisfaction of consumer needs.

A significant amount of research has been done to understand the consumer behavior and attitude towards an organization and how digital technologies have affected the perspective and image of organization from customer's point of view. Numerous surveys were conducted that collect data from consumers on how digital technologies and software has enhanced their relation with the customer care services of any organization. The main objective of the study is to investigate and explore that how digitalization has affected the firm reputation and consumer service. However, for empirical analysis, this study took an alternative turn to study the employee's perspective on how digitalization has affected their firm reputation and customer response. The study results will be a valuable addition to the extent to which employees are satisfied with their company's digital strategies and policies and whether they think digitalization helps improve their business image and customer response.

The pattern of the study is as follows. The first section is the introduction part that discusses the background of the study problem, a brief introduction of research objectives and the study's rationale. It is followed by a literature review covering the related theories and literature and highlighting innovation and digitalization's significance. Then the research methods are presented in which the researcher explains the research design, research approach, data collection tools and procedures and a brief introduction of data analysis. After that, data analysis and interpretation of results are provided. The results are provided in the form of

tables and figures and interpretation is provided for better understanding of the reader. In the end based on research findings, a conclusion and recommendations are presented.

# 1. Theoretical background

This section presents the related theories and theoretical research on the topic under study. The literature comprehensively covers the concept of the adoption and adaptation of innovation in business management and how innovation has impacted different aspects of the business.

## 1.1 Innovation Management

### 1.1.1 What is Innovation?

Kanter (1984) defines innovation as a "process of coming up with a new idea to solve a problem". Roger (1983) describes innovation as "new practice, idea or object perceived by individuals or an organization to solve their issues". In a broader aspect, Smith and Ainsworth (1989) explain innovation beyond just perceiving a new idea. According to the innovation, anything that offers novel unique and usable solutions to the challenges, opportunities, and problems people or institutions face. These challenges can be on a small or large scale. Alum and Drucker (1986) further added that innovation is a continuous process that requires focus and a systematic approach to acquiring new knowledge. According to him, innovation is not just a genius product but also requires much hard work (Kogabayev & Maziliauskas, 2017).

Under the organizational context, Higgins (1996) categorizes innovation into four groups. These include process innovation, management innovation, product innovation and marketing innovation. Process innovation helps to improve an organization's internal processes, like re-engineering and product innovation involves adding new updated versions of products and services. Management innovation helps better manage organizations, and marketing innovations improve the ways of promoting, distributing, and pricing products (Mohd Zawawi et al., 2016).

### 1.1.2 Impact of Innovation on Organizations

The studies on innovation in organizations emphasized that it is not merely a science but a form of art that could have both materialistic and psychological outcomes. The outcomes also vary based on the nature and type of organization undertaking an innovation. Researchers have identified two primary outcomes of innovation in an organization: tangible and intangible. Innovation helps achieve tangible outcomes like corporate success by increasing the organization's value, growth rate, and overall profitability. Innovative strategies help better market penetration increase the number of products and quality of service to the customers (The Express Wire, 2022).

It also increases efficiency by utilizing a structural approach to develop products and services. It helps improve the focus of the management and the employees and increases the chances that the organization will be involved in better processes and management practices, resulting in improved efficacy and effective changes. Innovation also results in happier and more productive employees as it enables them to work with flexibility and new methods that can positively excite them to improve their work performance (Tohidi & Jabbari, 2019). Organizations that practice innovation tends to have loyal employees who feel valued and vital by participating in innovative processes. Innovation also decreases employee turnover, fewer ascents,

flexible working environment and increases employee productivity. A high-tech working environment helps organizations modernize their working methods and utilize new technologies and approaches to improve production processes' and employees' efficiency and effectiveness. This practice also increases the employee's morale. Further innovation is also associated with continuous improvement. Innovative products result from innovative procedures and processes; therefore, organizations strive to be effective and more productive all the time and try to incorporate innovation at all levels (Chenhall & Moers, 2018). On the other hand, intangible outcomes are psychological and are observed in the beliefs and attitudes of the management, employees, and the customers towards an organization. The impact of innovation has been observed on the management as an innovative working environment. Managers exhibit a high level of confidence, better judgment and comfort. Additionally, they tend to take more risks and achieve things that may not be possible to achieve through traditional methods (Sviatnenko, 2021). Employees are also positively affected by innovation. Studies indicate that utilization of innovation develops an interest in a company's activities and positively impacts employees' opinions about their firm. Employees tend to become more aware, open and possess the comprehension to question new threats and opportunities. Team cohesion also improves at the organization level. Intangible outcomes of innovation are also observed in leadership styles. Innovative managers exhibit leadership traits like encouragement, understanding and mentoring of employees where they give their employees liberty to present their opinions and solutions for an issue.

## 1.2 Theory of Innovation Management

### 1.2.1 Trends in Research Theory

The evolution of innovation management theory was published by different researchers over time, like (Nakamori, 2004) and Michael (2005). Table 1 below presents a timeline of how innovation management theory has evolved and the main approaches focused on that period.

**Table 1:** Evolution of Innovation Management Theory.

Years	Theory
1970	Corporate R&D units as sources of innovation pushed technologies
1980s	Marketing departments instigated demand through promotion campaigns to generate market pull
1990s	Balanced Push-pull Innovative systems that integrated and aligned both efforts
2000s	Scholars started to investigate innovative ecosystems that contain self-driven innovative systems and interactions with their surrounding environment.
2010s	Strong influence from digital transformation and digital platforms that will further integrate current innovation management theory into open digital innovation ecosystems

Source: Bouwer (2017, p 21).

The Table 1 above indicated that in the beginning, the main source of corporate innovation was Research and Development, which pushed technology-driven products into the market. Later in the 1980s, innovation was utilized majorly by the marketing departments to generate market pull through their promoting campaigns. In the 1990s, the corporate created a balance and aligned both R&D and marketing efforts.

The beginning of the 20<sup>th</sup> Century marked the development of the innovation ecosystem when scholars started to argue that corporations should be self-driven in developing an innovative corporate system and interact with their surrounding environment in the same way. Since 2000, as this era is marked by digitalization, the influence of digital platforms has been well recognized, and researchers have focused on using innovation through the digital transformation of their business processes, especially marketing (Ortt & Van Der Duin, 2018).

### 1.2.2 Innovation Capabilities and Competencies

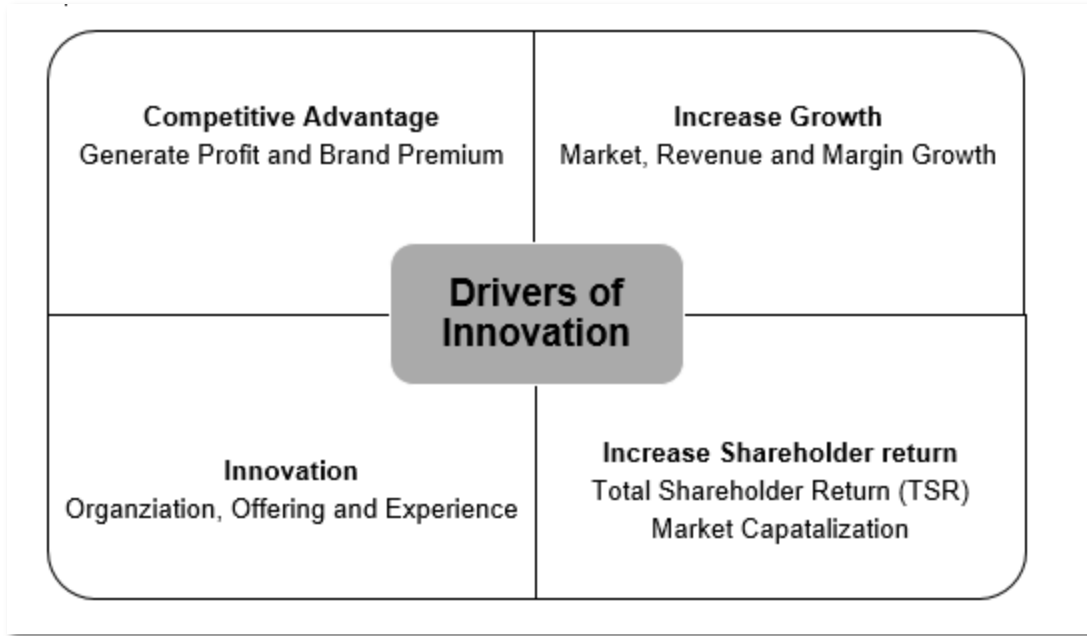
The main agenda of the corporate shareholders is to generate revenue and wealth through increased market share, market capitalization, profit margins and shareholder return. Since the past few decades, the strategies adopted by organizations to grow and gain competitive advantage have shifted tremendously from achieving merely production management, quality and fair priced products to dynamics like gaining economies of scale; and continuous development of capabilities through innovation to ensure that they will be able to introduce new innovative products steadily in this turbulent competitive global market (Björk et al., 2020). Table 2 below demonstrates a well-explained concept of innovation capabilities by Silverstein. et al. (2007). The figure illustrates how innovation acts as a structural system as an organization's exceptional capability and demonstrates the concepts developed over time.

**Table 2:** Innovative capabilities.

<b>Structured Productivity</b>	<b>Structured Quality</b>	<b>Structured Innovation</b>
Scientific Management (1910, Tylor)	SPC (1924, Shewhart)	TRIZ (1950s, Alshuller)
Mass Production )1920s, Ford	TQC (1950s, Demin, Juran, Crosby)	Strategic Thinking and Planning (1970s, Tofler, Duckler)
Toyota Production System (1950s, Onho Shingo)	Baldrige, TQM, Balanced Score card (Early 1990's, US congress, Norton, Kaplan)	Strategic thinking (1990s, Hamed, Christensen, Chesbrough)
Lean Production (1990s, Womack)	Six Sigma (Late 1990s Smith, Hary)	

Source: Silverstein et al. (2017, p.16).

Silverstein et al. (2007) believed that all the theories and concepts of innovation laid the basis of structured innovation. He argued that a well-structured innovative corporate system is the only way to gain a competitive advantage. It also allows the corporations to come up with valuable solutions to the problems of their consumers and customers in a predictable way that facilitates the achievement of brand recognition, shareholder satisfaction, the wellbeing of employees and increased profits (Brdulak et al., 2021). Figure 1 below summarizes the benefits of the structured innovation system. These benefits are also considered motivational drivers of innovation.



**Figure 1:** Motivational Drivers of innovation.

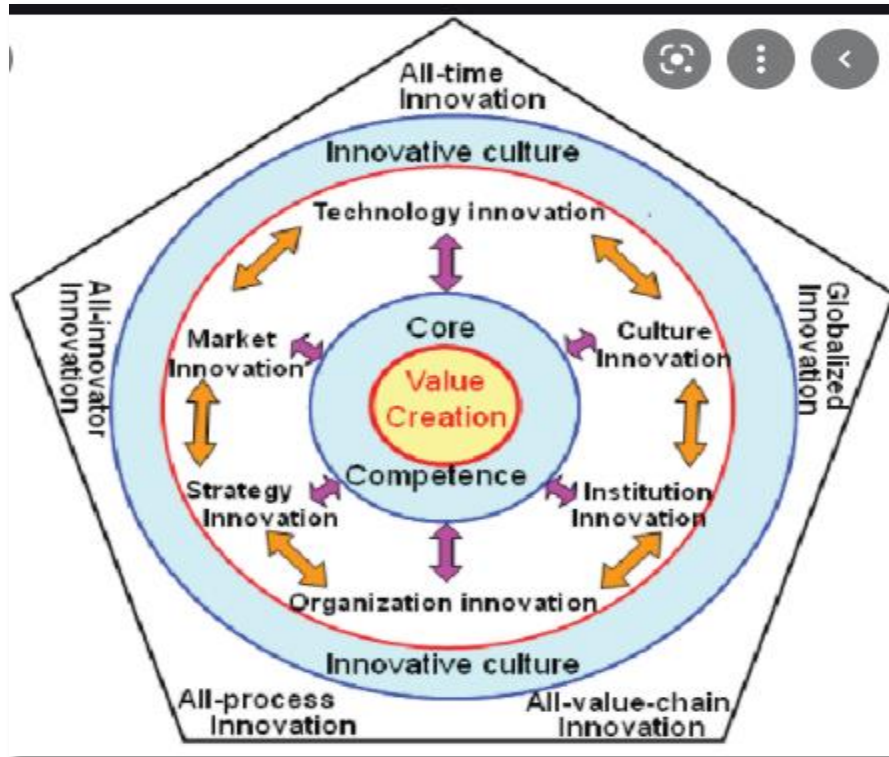
Source: Author's own elaboration based on Louis Bouwer (2015, p.32).

### 1.2.3 Capabilities driven Innovation Management Framework

The innovation capabilities and competencies were backed up by theories like (Silverstein et al., 2017)) which Teece and Pisano (1994) further elaborated in their Dynamic Capabilities Theory. Both these theories outline the strategies and methods that companies should adopt to gain a competitive advantage (Brdulak et al., 2021). In the 20th Century, researchers packed these theories into advanced innovative frameworks like Total Innovation Management (TIM) and (BVS) innovation. (Luo et al., 2022) defined TIM as “*An Innovation Synergy among Technology, Organization and Culture and oriented to build innovative competencies for an organization*”.

The Pentagon model of TMI is shown in the Figure 2 below.

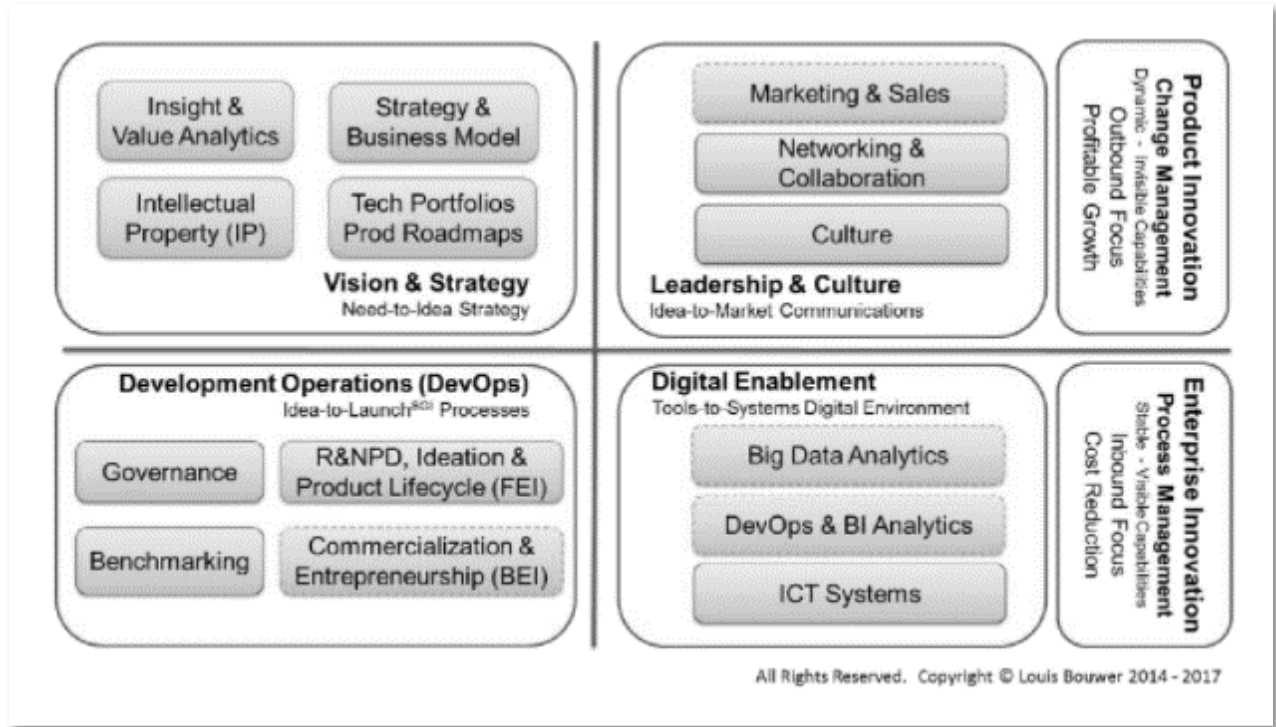




**Figure 2:** Pentagon Model of TMI.

Source: Yao and Li (2019, p.44).

The centre focus of this model is value creation through linking innovative capabilities of different departments of organizations (Yao & Li, 2019). The scope of this model is not limited to just mobilizing and operating in the local market, but it enables organizations to compete globally. Organizations adapt to some variations in the innovative operating frameworks depending upon their field, research scope and the market they are targeting. The latest model that integrates different theories and innovative management framework is developed by Bouwer (2022), known as the Capabilities Driven Innovation Model demonstrated in Figure 3 below. This framework helps organizations identify and define their targets where the companies should practice their innovation capabilities. Additionally, this framework helps to obtain and measure the metrics regarding the innovative framework implementation programs (Yao & Li, 2019).



**Figure 3:** Capabilities Driven Innovation Management Framework.

Source: Louis Bouwer (2022, p.112).

The model's scope is vast as it starts to form the beginning, such as how to incorporate innovation in the vision and strategy of a company, such as identification and management of the intellectual property and value analytics for developing the business model. Secondly, the framework covers the development operations such as governance and benchmarking and the development of innovative organizational culture and collaboration of networks for marketing and sales of the products. Options like Big Data analytics, ICT systems and BI analytics are offered for the digital enablement of the company (Marle, 2020).

## 1.2 Digital Management and Firm Reputation

Besides sales, reputation and business value are also some of the most significant preferences of any business. Reputation is usually measured as an intangible asset and can become a business liability too. Stakeholders perceive reputation as the level of trust the business has in itself. However, customer loyalty is the most significant brand identity and recognition factor. The use of digital channels for communicating and delivering organizational messages plays a significant role in establishing a positive relationship with consumers to develop an organizational image and to create brand equity (Lebron, 2022). Digitalization opens a wide scope for organizations to work in different areas to increase their brand reputation. Firm reputation covers variables like financial performance, product or service innovation, corporate culture and value for cost for the products or services acquired. The changing role of "Business Models" (BM) over the past few decades is continuously becoming a source of innovation and competitive advantage (Alvarado-

Vargas and Kelley, 2019) Over the years, researchers like (Capo, Brunetta and Boccardelli, 2014) have advocated why businesses require to develop innovative business models, which is also referred to as Business Model Innovation (BMI). The effect of BMI has been visibly noticed in practice towards customers and to meet the shareholder's expectations. BMI enables companies to integrate digital technologies into their production processes. The modernized product lifecycle is developed on digitalization's novel application and potential. These result in offering customers innovative, cost-effective, reliable products and better productivity. Innovative products are a great source of competitive advantage as consumers will develop trust in the organization (Norhaznan, 2021).

Research on the relationship between digitalization and financial performance are mostly focused on the industrial consulting corporation (Olurinola et al., 2021). These industries invested in extensive surveys to determine how their operational strategies affect their financial performance. Earlier, researchers claimed that having a single digital technology helps in increasing the firm performance, but later studies indicated that innovation and different types of digital technologies help organizations to increase their financial performance (Olurinola et al., 2021). Digitalization helps improve the communication among the different departments, but it also reduces the cost of finance management by utilizing modern software and Big Data Analysis. Further, the utilization of modern production technologies like the Internet, 3D printing, robotics and machine learning, and virtual relating have helped organizations reduce their production cost significantly. In this way, they are able to provide value for cost or price to the customers for their products and services. These significantly contribute to developing brand identity and equity, resulting in improved brand reputation (Lenka et al., 2016).

Corporate culture is also a well-debated variable when studying the firm's reputation. A firm's corporate culture determines how trained and skilful employees are. Further, it also reflects whether the environment is employee-friendly and if employees are satisfied and content with the firm. The reputation of an organization's corporate culture helps attract skilful employees to the company and improves employee retention. Companies whose corporate culture is built on digital technologies have better inter-department communications, better integration of their operations, a reflection of the better commitment to the organizational goals and efficient leadership practices. One of the leading digital organizations, Google's success depends upon their operations' innovation and digital transformation. Together, all these elements improve and establish a good brand reputation.

### **1.3 Digitalization and Consumer Care**

Another critical element in organizational success is establishing an effective customer care department. The past few decades in business studies have emphasized the importance of customer relationships in gaining competitive advantage and creating brand identity. The focus on business was mainly on production, sales, and profits. Less significance had been given to the customers' needs, wants, and satisfaction. However, modern businesses have given considerable importance and value to their customers as empirical studies indicates that positive customer relationship among firms and consumers

significantly impact the image of a company and can affect consumer behavior and attitude towards an organization (Matt et al., 2022). Previously, the customer care and response departments were not developed. Consumers utilized letters or e-mails to complain about their issues regarding the product and service and the solution could take up to weeks or months. Researches indicate that adequate customer support can result in customer loyalty, so companies should continuously improve this service (Patsavellas & Salonitis, 2019). Currently, leading organizations worldwide are utilizing Customer Relationship Management (CRM). CRM is software that facilitates businesses to develop a positive relationship with consumers, resulting in their retention and loyalty. Both these attributes are known for increasing the company's revenue. CRM also enables organizations to utilize the user interface to collect data that helps determine and develop better customer communication strategies (Matt et al., 2022).

Digitalization has revolutionized the way company's responsibility and care for their customers. With online and offline Internet channels, telephonic complaints, catboats, e-mail, complain registration through SMS or call and most importantly companies launching their mobile applications have made access to the management and the concerned department relatively easy for the customers. Additionally, as discussed above, CRM helps companies manage their customer relationship. Other than CRM, various customer care software like automatic generated messages, SMS and other similar software enables the firms to sort out their customers based on their concerns and complaints. In this way, they will be able to resolve their customer's issues in a timely and ineffective way because they know to whom the concern is directed and who can solve it (Meena, 2019).

Research in consumer studies has indicated that effective customer care and response positively affect consumer attitude. Customers satisfied with the service response are likely to develop a positive image for the organization. This, in return, affects their perception and attitude towards organizations and ultimately affects their purchasing decisions. Therefore, digitalization has helped organizations improve their customer response and service, contributing to their positive brand reputation and increased sales (Rachinger et al., 2019).

## **2. Methodology and Methods**

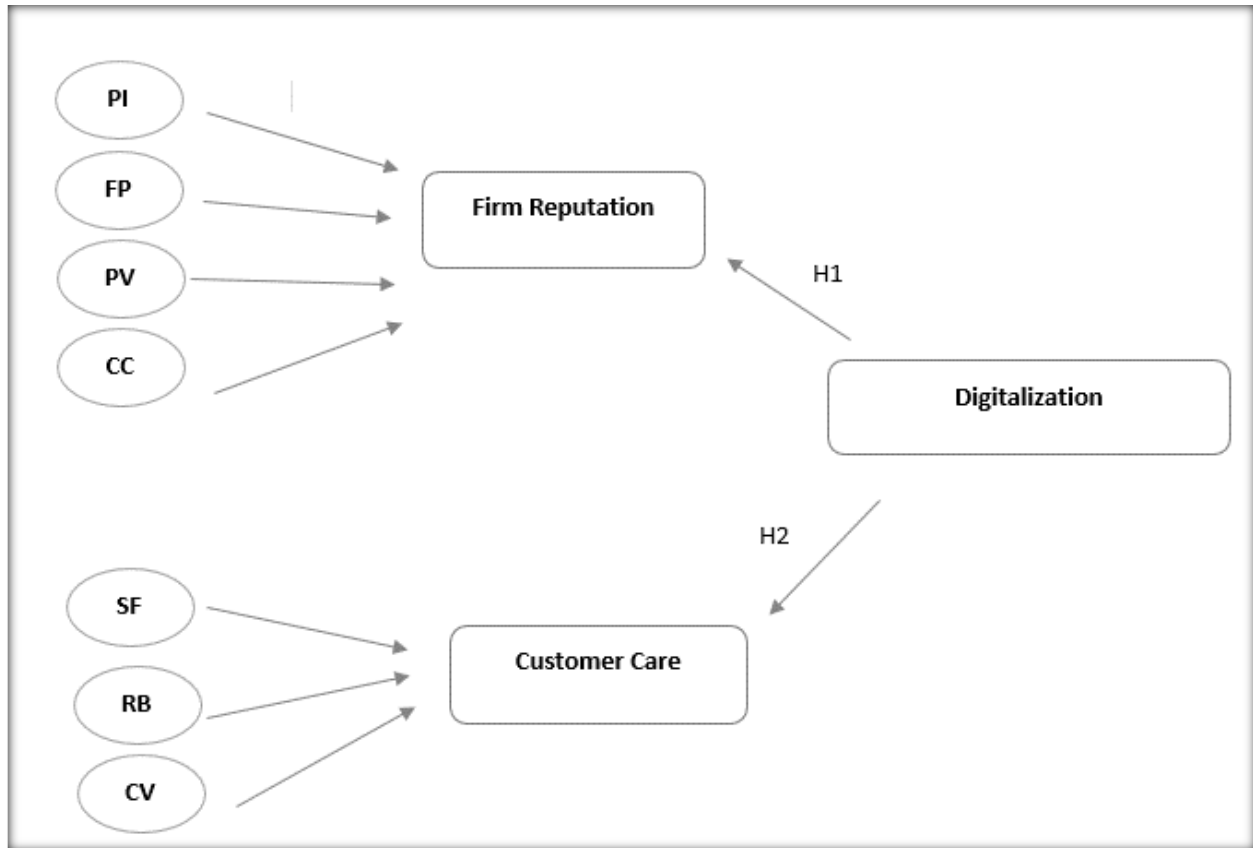
### **2.1 Objectives of the study**

The objectives of the current study are:

- To critically analyse the concept of innovation management in business and how it revolutionized over time;
- To study the effect of digitalization on the firm reputation;
- To study the effect of digitalization on the consumer care system of organization.

### **2.2 Research Model and Research Hypothesis**

The research model's main variables are digitalization, an independent variable, and the dependent variables are Firm Reputation and Customer care. The terms firm reputation and Customer Care are broad. To be more specific about what this research measures, we use the variables of firm reputation and customer response as defined and used by different researchers. The study measures these variables from organizational point of view. Therefore, customer care is utilized as a variable viewed by organizations that how well they utilize digitalization and other customer care innovations to improve their service. The most critical goal for any organization in their customer care is to gain customer satisfaction. Customer satisfaction is essential to driving consumer attitude and behavior towards an organization. Fornell et al., (2017) used variables like reliability, responsiveness, assurance and convenience to measure customer satisfaction. For this study, for Customer Care, the researchers use three variables which are Service Frequency/responsiveness (SF), reliability (RB) and Convenience (CV). Similarly, Firm Reputation is also measured through different variables used by researchers over time. Lim et al. (2015) used brand identity, corporate culture and ethics to measure and assess the level of firm reputation. On the other hand, Lee and Hall Jr (2014) studied financial performance to measure firm reputation. Harlia (2022) used variables like corporate social responsibility, the value offered, financial performance and shareholder's perspective to measure the Firm Reputation. For the current study, for the Firm Reputation, the researchers used variables Product Innovation (PI), Financial Performance (FP), Product Value (PV), and Corporate Culture (CC). The research model is shown in the Figure 4 below.



**Figure 4:** Research Model.

Source: Author's own elaboration.

Based on the research model the research hypotheses developed are as follow:

H<sub>1</sub>: Digitalization has a positive impact on Firm reputation

H<sub>2</sub>: Digitalization has a positive impact on Customer care

H<sub>3</sub>: Product Innovation has a significant impact on firm reputation

H<sub>4</sub>: Financial performance has a significant impact on firm reputation

H<sub>5</sub>: Product value has a significant impact on Firm reputation

H<sub>6</sub>: Corporate Culture has a significant impact on firm reputation

H<sub>7</sub>: Service Frequency has a significant impact on customer care

H<sub>8</sub>: Reliability has a significant impact on customer care

H<sub>9</sub>: Convenience has a significant impact on customer care

## 2.3 Research Methodology

Mixed method research is described as a research that involve collecting and analyzing and integrating the findings drawn from both quantitative and qualitative methods. The traditional data collection methods do not limit this type of research; however, the similar approach and guidelines used in both types of research methods are used as the foundation to collect data. Mixed methods research demonstrates qualitative and quantitative dimensions, and the issue only arises how these two elements can be appropriately related. Different researchers have different points of view regarding mixed method research. Some believe that mixed methods involve analyzing qualitative and quantitative data, while others argue for integrating these two approaches (Sommer Harrits, 2011). Creswell (2006), on the other hand, argued that mixed research is an evolving method and it should be open for discussion. Johnson et al. (2007) also argued that traditional approaches should not limit the scope of mixed method research. There is a lot that can be achieved by combining these research methods. On the other, researchers like Cooksey (2020) believed that quantitative and qualitative are two different paradigms, and combining these two paradigms is impossible.

Some researchers, like Edwards et al. (2018), shared that the debate on mixing qualitative and quantitative research approaches is far from comparing and integrating these two approaches. They believed that mixed method research provides an opportunity to maximize the study's strengths and limit each approach's weaknesses. They suggested that mixed method research allows the researchers to design their study so that it can answer the research questions more clearly and in an authentic way. Ramlo (2015) suggested that combining two pragmatic types of research can facilitate inquiring about all the possibilities that might lead to productive ends. Combining qualitative and quantitative methods can help focus on methodological concerns rather than metaphysical ones.

The mixed method approach is led by philosophical conventions that allow the mixing of qualitative and quantitative approaches in a research process. The research pragmatism today focuses on the notion that consequences are more significant than the process; therefore, any process that justifies the results can be utilized. The supporters of the mixed method approach advocate that it enables researchers to adopt a need-based or contingency approach for the concept and method selection (Dawadi et al., 2021). Further, it was argued that the scope of mixed method research is beyond the argument of qualitative vs. quantitative. Instead, it focuses on the usefulness of both methods. Researchers have identified the following benefits of mixed method research:

- Triangulation: this offers greater validity to the qualitative and quantitative data;
- Completeness: this offers to help in eliminating the errors and weaknesses of both approaches and provides a comprehensive picture of the results;
- Answering different research questions: Planko and Creswell (2006) advocated that researchers can answer research questions from a mixed method that cannot be answered by using a single approach (Cooksey, 2020).

For the current study, quantitative and qualitative research approaches are used as the researcher desires to understand the different dimensions of adopting and implementing digitalization.

## **2.4 Data Collection Tools**

As mentioned above, qualitative and quantitative data are collected for the study. Therefore, the researcher developed an open-ended interview and a questionnaire for the study.

Interviews are considered one of the most useful methods in a qualitative study. It is utilized for psychological and social science studies where a phenomenon has to be studied from a different perspective, and in-depth understanding is required. There are a lot of benefits of using interviews. First, it doesn't limit the response option for the participants. They can add or tell as much or as less as they desire. Secondly, a skilled interviewer can extract information by adding prompts, asking relevant questions, and getting involved in positive discussions. It enables the researcher to get information on a topic from different participants' perspectives.

For the current study, the researcher had developed an interview based on the variables identified in the study and analysis of the literature review. The design of the questionnaire was inspired by the work of Mohapatra and Anusree (2014). A total of seven questions were developed. The focus of these questions was that they help answer the research objectives or questions. The interview questionnaire is attached in Appendix 1.

Questionnaires are widely used in quantitative studies because of their various benefits. These questionnaires provide options to the participants from which they have to choose, thus reducing the error of getting deviated responses. Additionally, they are cheaper to develop, and people are more comfortable providing information or answers because of the confidentiality of their identity. The researcher developed a five-point Likert scale questionnaire for this study, with options expanding from 'Strongly Agree' to 'Strongly Disagree'. The questionnaire is attached in Appendix 2.

## **2.5 Sample Size**

The current study sample comprises managers and employees from manufacturing companies. The companies were shortlisted based on the research on how much they have incorporated and planned to incorporate digitalization in their business processes. These companies were selected based on their availability and permission to collect data from their managers and employees. As the current research is based on mixed research design, both quantitative and qualitative data are collected. For quantitative analysis, 50 employees were randomly chosen from the selected companies (See Table 3 below). The only selection criteria are set for employees who must have or serve in the customer care or marketing department.



**Table 3:** Sample companies.

<b>Company Name</b>	<b>Location</b>
Engenharia Líquida - Tecnologias de água	Portugal
Anglo Prisma, Import/Export, Ltd	Portugal
Greslar - Cerâmica Rústica	Portugal
Motivavence, Lda.	Portugal
Dudi, Indústria de Plásticos, Lda.	Portugal

For the interview, 10 managers were also selected from the above mentioned companies. Two managers, one marketing and one customer care manager were selected from each respective company, so ten managers were interviewed.

## **2.6 Statistical Techniques of Analysis**

### **2.6.1 Descriptive analysis**

The first analysis applied was frequency distribution and percentage analysis. The frequency distribution is a set of data organized to show the frequency of responses for each possible outcome and occurrence of an event repeated over time. They are usually represented in the form of tables, graphs or pie charts. It is a simple yet significant way of presenting data sets. A well-constructed frequency distribution enables the researcher to analyse the population under different characteristics

### **2.6.2 Correlation Analysis**

The second analysis applied was correlation analysis is utilized to determine the existence of relations among different variables. It helps to identify whether there exists a positive or negative relation among variables; and is measured by applying Pearson's correlation coefficient or Spearman's, if Pearson's coefficient cannot be produced. A positive relationship indicates that if one variable increases, another also increases; the negative relationship indicates that if one variable increases, another decreases. The value of correlation varies between 1 and -1. If the correlation value is 0, there is no relation among the variables. The value 1 means a perfect positive relationship exists among variables, and the value -1 means that a perfect negative relationship exists (Prematunga, 2012).

### **2.6.3 Regression Analysis**

The researcher also applied regression analysis to test the research hypothesis. It is a mathematical technique used by businesses to study one variable's impact on another. It helps identify parameters that have to be promoted and factors that can be ignored as they don't have any impact. To calculate the latent variables and to proceed with the application of linear regression it was necessary to calculate the respective means, transforming them into quantitative variables.

### **Simple linear regression:**

Simple linear regression model is used when a single explanatory variable X is analysed; whether it has a relationship with a response Y is a straight line. This simple linear regression model can be expressed as

$$\hat{Y}_i = \beta_0 + \beta_1 X_i + \varepsilon_i \quad (i = 1, 2, \dots, n) \quad \text{Equation (1)}$$

Where the intercept  $\beta_0$  and the slope  $\beta_1$  are unknown constants and  $\varepsilon$  is a random error component (Pardoe, 2012).

### **Multiple linear regression:**

When more than one regressor is used to check the response on Y, the multiple linear regression model is used. Normally, the response variable Y may be correlated to k regressors,  $X_1, X_2, \dots, X_k$ , so that

$$\hat{Y}_k = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \varepsilon_k \quad (k = 1, 2, \dots, n) \quad \text{Equation (2)}$$

Where the intercept  $\beta_0$  and the slope  $\beta_k$  are unknown constants and  $\varepsilon$  is a random error component (Johansen & Nielsen, 2016). In the current study, the multiple linear regression model is used to check digitalization's impact on a firm's reputation and consumer responses.

#### **2.6.4 Thematic Analysis**

The research also collects qualitative data to interpret that “Thematic analysis” was applied. It is one of the most suitable analysis techniques used for qualitative research. The thematic analysis enables the researcher to organize the raw data and identify the themes that can be applied to the whole data set. This helps to offer accuracy and add more meaning to the data. This analysis technique is flexible and suitable for complex data and allows the reader to understand and summarise the data collected.

### **2.7 Ethical consideration**

Ethical consideration refers to adhering to the set of rules and ethics necessary for conducting scientific research. It involves utilizing fair and authentic means for conducting research without harming any person or institute physically or emotionally. Additionally, the results should be reliable and authentic and should not mislead the reader about the actual facts. Most importantly, the work presented in research should be authentic and must not be copied or stolen from any other source. For the current research, all the ethical considerations were addressed. Consent of the participants were taken in advance (See Appendix 3), and their personal information was kept confidential. All the data presented is authentic, and proper referencing is provided wherever required.

### 3. Presentation and Analysis of Results

#### 3.1 Respondent profile

Demographic information of participants of a quantitative survey. Table 4 shows that majority of the participants were male (78%) and from age 25-35 (48%).

**Table 4:** Demographic Information of the Participants.

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	39	78%
Female	11	22%
<b>Total</b>	<b>50</b>	<b>100%</b>
<b>Age</b>	<b>Frequency</b>	<b>Percentage</b>
25-35	24	48%
35-45	10	20%
45-55	12	24%
Above 55	4	5%
<b>Total</b>	<b>50</b>	<b>100%</b>

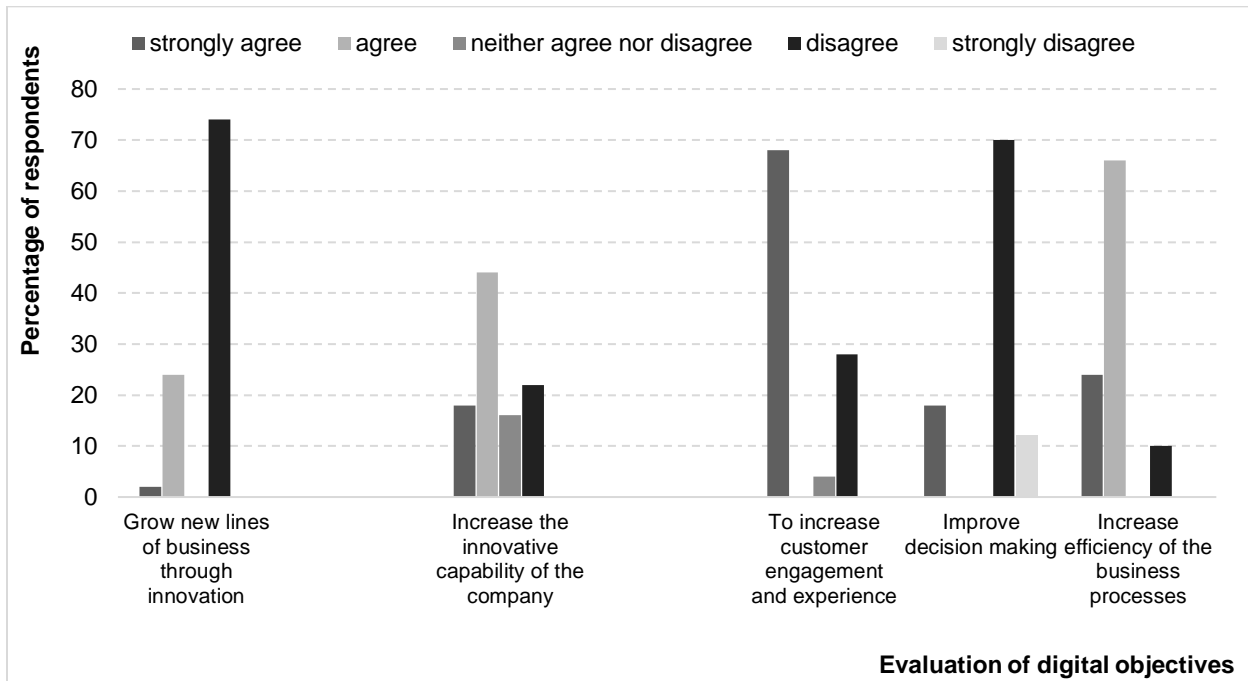
#### 3.2. Descriptive Analysis

Table 5 represents that the majority of the participants (42%) agree that their organization has clear and coherent digital management. On the other hand, a considerable number of participants (30%) disagree with the statement.

**Table 5:** Frequency and Percentages Distribution.

<b>Clear and Coherent Digital Management</b>	<b>N</b>	<b>%</b>
Strongly Agree	4	8.0
Agree	21	42.0
Neither Agree Nor disagree	5	10.0
Disagree	15	30.0
Strongly disagree	5	10.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

The researcher also gathered data to determine the major digital objectives of the companies selected. Figure 5 below demonstrates that most of the participants indicated that the major objective of their organization's digital strategies is to increase customer engagement and experience and increase business processes' efficiency. Decision making and growing new lines of business through innovation were the least selected options by the participants.

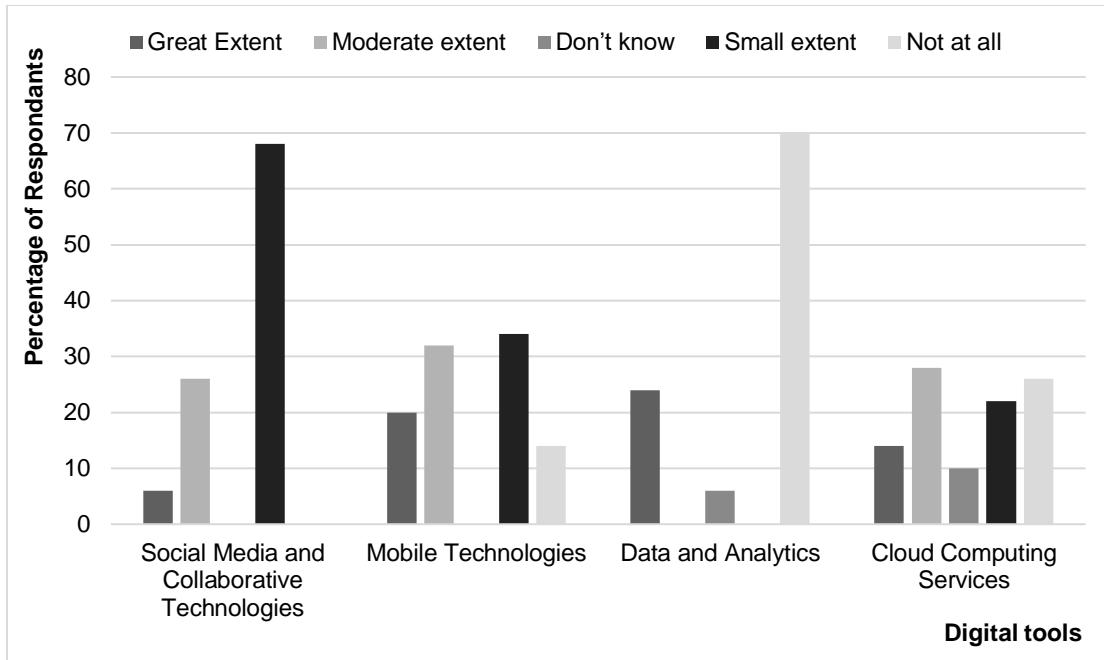


**Figure 5:** Digital Objectives of the organization.

### 3.3 Digital Technologies

Data was also collected on what types of digital technologies were used by the companies and to what extent.

The Figure 6 below shows the extent to which different digital technologies are used by the selected companies. None of the technologies were reported to be used in greater extent. Use of mobile technologies, social media collaborative technologies and cloud computing was indicated to be used moderately or to a small extent. Data analytics which are bringing revolution in businesses was found to be least utilized digital technology.



**Figure 6:** Digital technologies utilized by the companies.

The Table 6 shows that majority of the participant's (68%) agree that their organization see digital technology as an opportunity to grow and develop in business

**Table 6:** Frequency and Percentage analysis.

<b>Digital technology as an Opportunity</b>		
	Frequency	Percentage
Strongly Agree	8	16.0
Agree	34	68.0
Disagree	8	16.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

When asked whether their firm is ready to respond to new and innovative digital trends, mixed responses were obtained from participants. The Table 7 above shows that the responses were more on the negative side as 34% and 26% participants disagreed and strongly disagreed with this statement. Only 20% agree that their organization is ready for new digital trends.

**Table 7:** Firms readiness towards digital trends.

<b>Readiness to respond to digital trends</b>		
	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	2	4.0
Agree	10	20.0
Neither Agree Nor disagree	8	16.0
Disagree	17	34.0
Strongly disagree	13	26.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

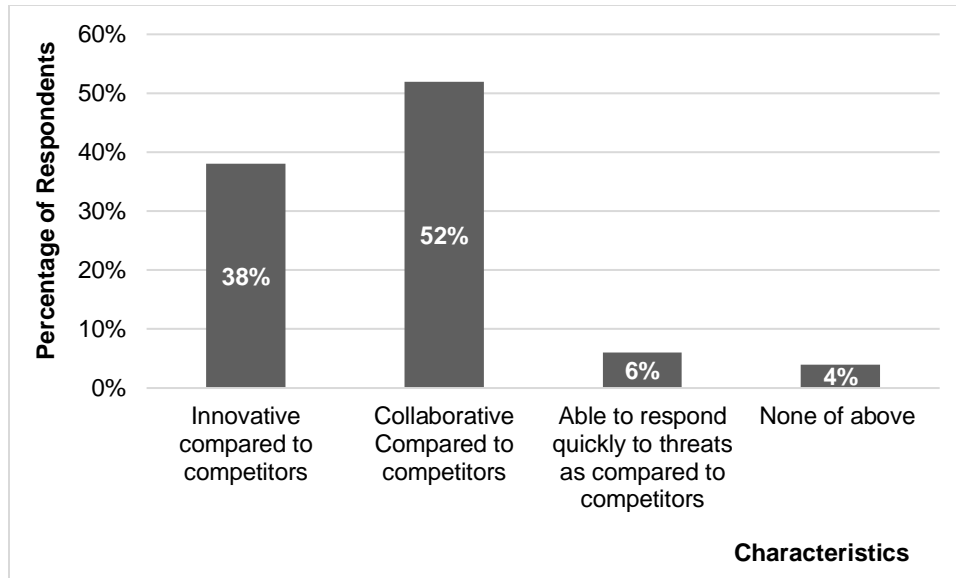
The Table 8 indicated that all the participants disagree and strongly disagree with the statement that their organization consider or sees technologies and digitalization as a threat.

**Table 8:** Frequency and percentage analysis.

<b>Technologies as a threat</b>		
	<b>Frequency</b>	<b>Percentage</b>
Disagree	34	68.0
Strongly disagree	16	32.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

The researcher also asked the participants to characterize their organization based on their prime objectives or operating strategies. The options provided asked participants to tell how their organization is better than its competitors, in their opinion.

Figure 7 shows that most of the participants (52%) indicated that their organization is collaborative compared to their organization that indicated a good corporate culture. 38% of participants believed that their organization is innovative compared to their competitors. Only 6% believed that their organization can respond quickly to the threats and opportunities compared to their organizations.



**Figure 7:** Organizational Characteristics.

Participants were also asked to articulate who manages the digital strategies in their organisation. They were asked to indicate the highest level or rank. This information helps to get an insight that how much significance and value does an organization give to their digital operations and digitalization as a whole.

**Table 9:** Management of digital strategy.

<b>Manage digital strategy</b>		
	Frequency	Percentage
VP level	6	12.0
Director level	5	10.0
Manager level	32	64.0
Staff-level coordinator	7	14.0
<b>Total</b>	<b>50</b>	<b>100.0</b>

The information presented in table 9 shows that the majority of the participants (64%) indicated that the highest level of administration to control and manage digital strategies is the manager level. 14 % indicated that the coordinator supervises their digital operations and activities, while 12% said that directors are involved, and 12% stated that it is managed at VP level.

### 3.4 Correlation Analysis

In this section of analysis, correlation is applied to the variables. First, the correlation between digitalization and customer response variables was obtained to indicate whether digitalization and variables of customer response like Service Frequency (SF), Reliability (RB) and Convenience (CV) are positively correlated or negatively correlated. These variables were obtained from the research model and questionnaire was divided under these variables. The correlation is applied on the related questions for each variable.

**Table 10:** Correlation of digitalization and Customer Care.

		SF	RB	CV
Digitalization	Pearson Correlation	.866	.841	.890
	p-value	<.001	<.001	<.001
	n	50	50	50

The Table 10 shows that the Pearson Correlation value between the digitalization and service frequency SF is 0.866, indicating a strong positive relationship between service frequency and digitalization. Similarly, reliability RB and convenience CV also have a strong relationship with digitalization. The correlation value of both variables is close to +1, indicating a strong relationship. It can be concluded that digitalization and customer response are positively related. CV demonstrates the highest correlation value ( $r=.890$ ), indicating that digitalization facilitated convenience in customer care.

### 3.5 Digitalization and Firm reputation

The correlation was also applied on digitalization and variables of firm reputation. The correlation indicates that whether digitalization has a positive or negative relation with Product Innovation (PI), Firm Performance (FP), Product Value (PV) and Corporate Culture (CC). The Table 11 shows the correlation value of digitalization and variables of Firm reputation. All the variables show a strong positive relation with digitalization, indicating that digitalization helps improve product innovation, firm performance, product value, and corporate culture. The value of financial performance is the greatest ( $r=.907$ ), which means that digitalization can significantly improve firm's financial performance.

**Table 11:** Correlation of Digitalization and Firm Reputation

		PI	FP	PV	CC
Digitalization	Pearson Correlation	.795	.907	.881	.881
	p-value	<.001	<.001	<.001	<.001
	n	50	50	50	50



### 3.6 Regression analysis

Lastly, the regression analysis was applied to study the impact of digitalization on customer response and firm reputation. The regression analysis results determine whether digitalization positively or negatively impacts customer response and firm reputation and test the research hypotheses.

**Table 12:** Model summary and ANOVA analysis.

<b>Model Summary</b>						
	<i>r</i>	<i>r</i> Square	Adjusted <i>r</i> Square	Std. Error of the Estimate		
	.971	.942	.937	.210		
<b>ANOVA</b>						
Model		Sum of Squares	df	Mean Square	F	p-value
Regression		32.281	4	8.070	182.348	<.001
Residual		1.992	45	.044		
Total		34.273	49			
<b>Coefficients</b>						
Model	Unstandardized Coefficients		Standardized Coefficients		t-Student	p-value
	<i>B</i>	Std. Error	Beta			
(Constant)	.293	.118			2.495	.016
PI	.039	.086	.047		.450	.655
FP	.573	.062	.564		9.272	<.001
PV	.430	.097	.034		.312	.006
CC	.406	.099	.413		4.079	<.001
Dependent Variable: Digitalization						
Predictors: (Constant), CC, FP, PI, PV						
Note: PI (product Innovation), FP (Financial Performance), PV (Product value), CC (Corporate Culture).						

The value of adjusted *r* square in the above model is 0.937, which shows that the correlation between digitalization and variables of firm reputation is good enough for further analysis. The p-value of the ANOVA is less than 0.05, indicating a significant relationship between the variables. The p-values of variables of firm reputation in the regression analysis indicate the null hypothesis is accepted.

The above regression analysis was used to test the Research Hypotheses. The Table 13 below demonstrates whether the null hypotheses developed for firm reputation is accepted or rejected.

**Table 13:** Hypothesis testing of variables of firm reputation.

Independent variables	Hypothesis Testing Result at 95% confidence interval	Results
PI	Null hypothesis not rejected as 0.655 > 0.05	Not Rejected
FP	Null hypothesis rejected as 0.005 < 0.05	Rejected
PV	Null hypothesis rejected as <0.001 < 0.05	Rejected
CC	Null hypothesis rejected as <0.001 < 0.05	Rejected

The Table 13 above shows that for product innovation Null hypothesis is not rejected as 0.655 > 0.05, which indicates that digitalization has no impact on product innovation. However, for firm performance, product

value and corporate culture Null hypothesis were rejected as  $0.005 < 0.05$ , indicating that digitalization positively impacts all these variables.

The value of adjusted r square in the above model is 0.860, which shows that the correlation between digitalization and variables of customer response is good enough for further analysis, and indicates that the model is adequate to determine the relationship between digitalization and customer care. The p-value of the ANOVA is less than 0.05, which shows that there is a significant relationship between the variables. The coefficient values of variables of customer response in the regression analysis are less than 0.05, which is significant.

**Table 14: Model Summary and ANOVA Analysis.**

<b>Model Summary</b>						
Model	<i>r</i>	<i>r</i> Square	Adjusted <i>r</i> Square	Std. Error of the Estimate		
1	.932 <sup>a</sup>	.868	.860	.313		

<b>ANOVA</b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.753	3	9.918	100.939	<.001
	Residual	4.520	46	.098		
	Total	34.273	49			

<b>Coefficients</b>						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.213	.194		1.097	.279
	SF	.397	.079	.480	5.002	<.001
	RB	-.160	.142	-.168	-1.130	.265
	CV	.822	.167	.667	4.931	<.001

Predictors: (Constant), CV, SF, RB

Dependent Variable: Digitalization

Note: CV (Convenience) SF (Service Frequency), RB (Reliability).

The above regression analysis used to test the hypothesis developed for customer care.

**Table 15:** Hypotheses testing for variables of customer care.

Independent variables	Hypothesis Testing Result at 95% confidence interval	Result
SF	Null hypothesis rejected as $<0.001 < 0.05$	Rejected
RB	Null hypothesis not rejected as $0.265 > 0.05$	Not Rejected
CV	Null hypothesis rejected as $<0.001 < 0.05$	Rejected

Table 15 above shows that the null hypothesis is rejected for service frequency and convenience as the value obtained is  $<0.001 < 0.05$  which indicates that digitalization positively impacts service frequency and convenience offered by customer care. However, on the other hand, the null hypothesis for reliability of customer care is not rejected and digitalization was found to have no impact on the reliability of customer care services.

### 3.7 Thematic analysis

In this section the thematic analysis for the interview is presented. From the interview responses major themes were identified and then they were explained reflecting the core ideas and information obtained from the participants

**Table 16:** Thematic Analysis.

Question	Themes Identified	Explanation
How would you characterize your organization in terms of digitalization	"Pursuing innovation"	Managers expressed that their organizations are willing to learn and adapt to new innovative digital systems. As one of the managers states, <i>"We are continuously looking for new innovative solutions for our products and other functional operations."</i> All the managers expressed that their organizations are interested in pursuing innovation in all departments.
	"Willingness to incorporate digital technologies"	Managers also expressed that they are well aware of the benefits of integrating digital technologies for their operations. As one of the managers states, <i>"In board meetings, we raise the point that a proper digital setup should be established and the presence of a common communication channel. This will facilitate the development of a productive working environment."</i> However, some managers address the concerns and limitations in integrating digital technologies like approval from top management, budget restriction, employee training and development, etc.
	"Value the significance of digitalization"	The managers also expressed that their organization value the significance of digitalization for improving their work efficiency as well as delivering quality products and services to the customers.
	"Long term impact"	The managers' responses reflect that they are not entirely convinced that digitalization can bring immediate financial

To what extent do digital technologies improve your financial performance and how?	"Burden on the Budget"	<p>benefits. As one of the manager's states, <i>"well, they do improve efficiency, but it does not mean that you instantly start making double money."</i></p> <p>Managers believed that the impact of digitalization is long-term. It took time to align with digital strategies thoroughly, and gradually, the work environment and employees got along with the digitalized setup. As one of the managers states,</p> <p><i>"The impact of digitalization on our profits cannot be ignored; it not only reduces resource utilization in production but also increases communication and enable us to offer better and latest products. However, the whole process took time and required much responsibility from leadership and top management only then the financial goals can be achieved."</i></p>
To what extent your company is utilizing digitalization for product and service innovation? Does it have an impact on firm reputation?	"Limited utilization"	<p>Most of the managers were not entirely convinced of the financial benefits of digitalization because they considered it a financial burden, especially if the scale of the business is small or medium. As one of the managers states,</p> <p><i>"We cannot totally rely on digitalization to improve our profits; establishing a digital setup itself requires much investment."</i></p> <p>Another manager states,</p> <p><i>"In a small business setup, we usually do not have many resources to integrate digital technologies, plus it also requires maintenance training and development, which is not possible for us."</i></p> <p>However, managers expressed that they use online and other simpler digital technologies to improve their efficiency.</p>
To what extent your company is utilizing digitalization for product and service innovation? Does it have an impact on firm reputation?	"Higher product quality higher the brand image"	<p>Mixed responses were obtained to determine the extent to which companies utilise digitalization in their product and service innovation. Some managers indicated that their companies had adopted an automatic and computer-based system for their production process to ensure error-free and high-quality products. One of the managers states, <i>"we are utilizing machines that operate with automated and code-based systems. This helps us in minimizing the number of employees and save our time as well"</i></p> <p>All the managers agree that innovative products result in better quality and reliability. This helps affect customer perception about an organization and helps achieve brand identity. A manager states</p> <p><i>"We are well aware of the fact that customers today demand innovative and new products that offer maximum value to their money. Utilization of digital networks for designing, production and distribution of our products helps in offering high-quality products that attract existing and new customers."</i></p> <p>Managers expressed that they are trying their best to utilize digitalization to offer high-quality and valued products to their customers. In this way, they will be able to establish a positive reputation and can gain a competitive advantage over their customers</p>
Do you think digitalization helps in developing a better corporate culture? If	"Better communication"	The managers' most common response was that digitalization is very helpful in facilitating communication among the organization.

yes? What benefits you see.	<p><i>“Digital technologies are of course improving and enhancing the way we communicate and deliver our message, which of course is good for our organizational culture,”</i> says a manager. Further, they expressed that it also helps in dispute management. As one of the manager states, <i>“when communication is better, there are less disputes and things get sorted in a mature way”</i></p>	
“Efficiency of service”	<p>The managers also expressed that digitalization is a source for increasing the efficiency of service within the departments. As one of the manager states, <i>“digital technologies are surely increasing the speed and reliability of our operations.”</i></p> <p><i>“Human error is obvious, the use of technologies allows us to reduce the error in our operations and execution of service”.</i></p> <p>Managers believed that integrating digital technologies in their business processes helps to improve the business performance in terms of employee and financial performance.</p>	
“Frustrating for employees if not well trained”	<p>On the other hand, managers also pointed out that digital technologies can be a draw back for an organization if the staff is not well prepared and trained to utilize the innovative technologies.</p> <p>As one of the manager’s states, <i>‘adopting and implementing a new innovative system is always a challenge, there is lit of prep, along with training of the employee...!’</i></p> <p>Another manager states, <i>“It can be frustrating for employees and for the leaders if there is not sufficient readiness for the use of the implementing technology.”</i></p>	
To what extent you are using digitalization for customer response and care? What are the technologies you are utilizing?	<p>Managers expressed that they are trying their level best to incorporate modern technologies to improve their customer response services.</p> <p><i>“I think we are doing pretty good, we don’t have a lot of complaints in line so we are managing it sufficiently”</i></p> <p>On the other hand organizations were found out to be using different technologies for their customer care. The most common told by managers were telephonic complaints, e-mails, chat boxes and few also mentioned taking complaints on their company’s website. Mobile application was mentioned to be the pipeline project of many organization.</p>	
“Budget limitations for better and upgrade software”	<p>Managers also expressed their concerns and limitations regarding the use of latest technologies in their customer care and communication channels. The main issue identified is the budget restriction and requirements for setting up a digital and innovative customer care department. As one of the manager states,</p> <p><i>“We are aware that there are new and effective software available that can help us significantly to improve our customer response but it needs a lot of investment, convincing investors to put a lot of money alone on software are usually challenging provided it has guaranteed financial outcomes”.</i></p>	
How would you characterize your	“Pursuing innovation”	<p>Managers expressed that their organizations are willing to learn and adapt to new innovative digital systems. As one of the managers states,</p>

organization in terms of digitalization	<p><i>"We are continuously looking for new innovative solutions for our products and other functional operations."</i></p>
"Willingness to incorporate digital technologies"	<p>All the managers expressed that their organizations are interested in pursuing innovation in all departments.</p> <p>Managers also expressed that they are well aware of the benefits of integrating digital technologies for their operations. As one of the managers states,</p> <p><i>"In board meetings, we raise the point that a proper digital setup should be established and the presence of a common communication channel. This will facilitate the development of a productive working environment."</i></p>
"Value the significance of digitalization"	<p>However, some managers address the concerns and limitations in integrating digital technologies like approval from top management, budget restriction, employee training and development, etc.</p> <p>The managers also expressed that their organization value the significance of digitalization for improving their work efficiency as well as delivering quality products and services to the customers.</p>
To what extent do digital technologies improve your financial performance and how?	<p>The managers' responses reflect that they are not entirely convinced that digitalization can bring immediate financial benefits. As one of the manager's states, <i>"well, they do improve efficiency, but it does not mean that you instantly start making double money."</i></p> <p>Managers believed that the impact of digitalization is long-term. It took time to align with digital strategies thoroughly, and gradually, the work environment and employees got along with the digitalized setup. As one of the managers states,</p> <p><i>"The impact of digitalization on our profits cannot be ignored; it not only reduces resource utilization in production but also increases communication and enable us to offer better and latest products. However, the whole process took time and required much responsibility from leadership and top management only then the financial goals can be achieved."</i></p>
"Long term impact"	<p>Most of the managers were not entirely convinced of the financial benefits of digitalization because they considered it a financial burden, especially if the scale of the business is small or medium. As one of the managers states,</p>
"Burden on the Budget"	<p><i>"We cannot totally rely on digitalization to improve our profits; establishing a digital setup itself requires much investment."</i></p> <p>Another manager states,</p> <p><i>"In a small business setup, we usually do not have many resources to integrate digital technologies, plus it also requires maintenance training and development, which is not possible for us."</i></p> <p>However, managers expressed that they use online and other simpler digital technologies to improve their efficiency.</p>

<p>To what extent your company is utilizing digitalization for product and service innovation? Does it have an impact on firm reputation?</p>	<p>“Limited utilization”</p>	<p>Mixed responses were obtained to determine the extent to which companies utilise digitalization in their product and service innovation. Some managers indicated that their companies had adopted an automatic and computer-based system for their production process to ensure error-free and high-quality products. One of the managers states, <i>“we are utilizing machines that operate with automated and code-based systems. This helps us in minimizing the number of employees and save our time as well.”</i></p>
	<p>“Higher product quality higher the brand image”</p>	<p>All the managers agree that innovative products result in better quality and reliability. This helps affect customer perception about an organization and helps achieve brand identity. A manager states</p> <p><i>“We are well aware of the fact that customers today demand innovative and new products that offer maximum value to their money. Utilization of digital networks for designing, production and distribution of our products helps in offering high-quality products that attract existing and new customers.”</i></p> <p>Managers expressed that they are trying their best to utilize digitalization to offer high-quality and valued products to their customers. In this way, they will be able to establish a positive reputation and can gain a competitive advantage over their customers.</p>
<p>Do you think digitalization helps in developing a better corporate culture? If yes? What benefits you see.</p>	<p>“Better communication”</p>	<p>The managers' most common response was that digitalization is very helpful in facilitating communication among the organization.</p> <p><i>“Digital technologies are of course improving and enhancing the way we communicate and deliver our message, which of course is good for our organizational culture,”</i> says a manager. Further, they expressed that it also helps in dispute management. As one of the manager states,</p> <p><i>“when communication is better, there are less disputes and things get sorted in a mature way”.</i></p>
	<p>“Efficiency of service”</p>	<p>The managers also expressed that digitalization is a source for increasing the efficiency of service within the departments. As one of the manager states,</p> <p><i>“digital technologies are surely increasing the speed and reliability of our operations.”</i></p> <p><i>“Human error is obvious, the use of technologies allows us to reduce the error in our operations and execution of service”.</i></p> <p>Managers believed that integrating digital technologies in their business processes helps to improve the business performance in terms of employee and financial performance.</p>
	<p>“Frustrating for employees if not well trained”</p>	<p>On the other hand, managers also pointed out that digital technologies can be a draw back for an organization if the staff is not well prepared and trained to utilize the innovative technologies.</p>

<p>To what extent you are using digitalization for customer response and care? What are the technologies you are utilizing?</p>	<p>"Incorporating digitalization sufficiently"</p>	<p>As one of the manager's states, <i>'adopting and implementing a new innovative system is always a challenge, there is lit of prep, along with training of the employee...!</i></p> <p>Another manager states,</p> <p><i>"It can be frustrating for employees and for the leaders if there is not sufficient readiness for the use of the implementing technology."</i></p>
	<p>"Incorporating digitalization sufficiently"</p>	<p>Managers expressed that they are trying their level best to incorporate modern technologies to improve their customer response services.</p> <p><i>"I think we are doing pretty good, we don't have a lot of complaints in line so we are managing it sufficiently"</i></p> <p>On the other hand organizations were found out to be using different technologies for their customer care. The most common told by managers were telephonic complaints, e-mails, chat boxes and few also mentioned taking complaints on their company's website. Mobile application was mentioned to be the pipeline project of many organization.</p>
	<p>"Budget limitations for better and upgrade software"</p>	<p>Managers also expressed their concerns and limitations regarding the use of latest technologies in their customer care and communication channels. The main issue identified is the budget restriction and requirements for setting up a digital and innovative customer care department. As one of the manager states,</p> <p><i>"We are aware that there are new and effective software available that can help us significantly to improve our customer response but it needs a lot of investment, convincing investors to put a lot of money alone on software are usually challenging provided it has guaranteed financial outcomes".</i></p>



## **Conclusion, Limitations and Recommendations**

The study was designed to analyse how companies utilize innovation management and digital strategies to improve their customer response services and firm reputation. The literature presented in section two provides enough empirical and theoretical evidence to support the fact that innovation and digitalization if incorporated and utilized effectively, can bring numerous benefits to the companies. The literature also suggested that researchers have developed several business models based on innovation to increase the productivity and performance of organizations based on its significance. It was comprehended that innovation gradually helps organizations improve their product quality and quality of services, increasing their efficiency and performance. These attributes build a positive firm's reputation and increase customer loyalty.

For the current study, an empirical analysis was conducted in which qualitative and quantitative data were obtained to determine to what extent digitalization improves a firm reputation and customer response. The questionnaire analysis indicated that most of the organizations had a clear and coherent digital management system, with the main focus of the digital strategies being to increase the efficiency of their operations and improve customer experience. The companies moderately utilized digital technologies like collaborative networks, social media tools and cloud computing. Data analytics was found to be used by only a few companies. Digital technologies were observed as a new opportunity. However, it was not found to prepare organizations to respond quickly to changing digital trends. The organizational culture was collaborative and innovative for most organizations, where most of the digital management is handled at the managerial level. The correlation analysis indicated a strong positive relation between digitalization and variables of customer response. This means that digitalization was positively correlated with service frequency, reliability and convenience. A positive correlation was also found between digitalization and a firm's reputation. A strong positive relationship is found between digitalization and product innovation, firm performance, product value and corporate culture. The impact of digitalization on customer care and firm reputation was analysed for regression analysis. It was found that digitalization has a positive impact on corporate culture, firm performance and product value; however, digitalization was found to have no impact on product innovation. On the other hand, for customer response, digitalization was found to impact service frequency and convenience offered to customers positively. Digitalization was found to have no impact on the reliability of customer service.

The thematic analysis was applied to the data collected by managers. The analysis indicated that managers believed that their organizations are willing to incorporate digital technologies and pursue innovation in all departments as they value the significance of digital management. Managers express that impact of digital technologies can be long-term and require much investment in the initial phases, which is usually a burden on finances if the business setup is not on a large scale. Digitalization was not found to be utilized for product innovation. However, managers believed that high-quality products facilitate the positive image of the firm. The thematic analysis also indicated that the significance of digitalization and the latest innovations

in the customer care department could significantly improve customer response. However, most of the participants indicated the restraint of the budget for purchasing and implementing new technologies. It is recommended that organizations and managers truly understand the effectiveness of innovation in their business process, and to make it successful, an appropriate business innovation model must be adopted. Today, innovation frameworks like “Doblin 10 types of innovation” offer businesses multiple innovative business models classified based on their goals and business objectives. In this way, they will not only be able to manage their innovative finances but can also convince or satisfy shareholders with their performance.

The study's limitation is that it does not consider the customer's perspective and presents only an organizational perspective on digitalization. Customers are drivers for a firm reputation, and how well an organization improve its customer response can be better analyzed through customer feedback. Future research could include this aspect to further add to the study findings.

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# Appendix 1

## Interview Questions

Q1. How would you characterize your organization in terms of digitalization?

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Q2. To what extent do you think digital technologies are improving your financial performance and how?

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Q3. To what extent your company is utilizing digitalization for product and service innovation? Does it have an impact on firm reputation??

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Q4. Do you think digitalization helps in developing a better corporate culture? If yes? What benefits you see?

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Q5. To what extent you are using digitalization for customer response and care? What are the technologies you are utilizing?

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Q6. How do you think digitalization helps in improving your firm reputation?

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Q7. Do you believe that your customer care departments are reliable and efficient? How do you collect data to measure its efficiency and performance?

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## Appendix 2

### Demographic Information

Gender	Male	Female

Age	
25-35	
35-45	
45-55	
55 and above	

My organization has a clear and coherent digital management strategy

Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
1	2	3	4	5

To what extent do you believe that following are the digital objectives of your organization?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly disagree
To grow new lines of business through innovation	1	2	3	4	5
Increase the innovative capability of the company	1	2	3	4	5
To increase customer engagement and experience	1	2	3	4	5
Improve decision making	1	2	3	4	5
Increase efficiency of the business processes	1	2	3	4	5

Does your organization use the following digital technologies?

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly disagree
Social Media and Collaborative Technologies	1	2	3	4	5
Mobile Technologies	1	2	3	4	5
Data and Analytics	1	2	3	4	5

Cloud Computing Services	1	2	3	4	5
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My organization views digital technologies as an opportunity

Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
1	2	3	4	5

I am confident in my organization's readiness to respond to digital trends.

Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
1	2	3	4	5

My organization views digital technologies as a threat.

Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
1	2	3	4	5

How would you characterize your organization?

- Innovative compared to our competitors
- Collaborative compared to our competitors
- Able to respond quickly to threats or opportunities compared to our competitors

What is the highest level/rank of the individual(s) whose job it is to oversee/manage your organization's digital strategy?

- C-suite
- Director level
- Manager level
- Staff-level coordinator
- VP level, business unit president or other top level executive but below C-suit

How is your organization implementing digital initiatives? (

- Use of experiments or pilots
- Cross functional team
- Bottom up from pockets of groups across enterprise
- Top down from a central senior leadership team

#### Variables of Customer Care

	Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
SF1.I am satisfied with frequency of our customer service	1	2	3	4	5
R1 Our customer service is reliable because of modern tools	1	2	3	4	5

CV1Customers can easily contact us through different communication channels	1	2	3	4	5
RS1We have abundant customer care stations for responsiveness	1	2	3	4	5
SF2 we use computer technology integration for customer response	1	2	3	4	5
CV2 we have in call center, telephonic response and e-mail response management	1	2	3	4	5
CV2 we have virtual assistants for consumer response	1	2	3	4	5
We offer mobile customer service application to our customers	1	2	3	4	5

#### Variables of Firm's Reputation

	Strongly Agree	Agree	Neither Agree Nor disagree	Disagree	Strongly disagree
PF1Digital technologies are helping us to improve our profit margins	1	2	3	4	5
FP2Our financial performance is a strong indicator for our firm reputation	1	2	3	4	5
PI1We offer a wide variety of innovative and latest products to the customers	1	2	3	4	5
PV1Our company has a reputation of offering highly valued products and services	1	2	3	4	5
PVDigitalization helps us in developing a positive attitude in consumers about our services	1	2	3	4	5
CC1Our corporate culture is based on digital technologies	1	2	3	4	5
CC2Our corporate culture attract skillful employees	1	2	3	4	5

# Appendix 3

## Consent form

### Research Informed Consent

#### TITLE OF STUDY

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#### PRIMARY RESEARCHER

Name - \_\_\_\_\_

Department - \_\_\_\_\_

Address - \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Phone - \_\_\_\_\_

Email - \_\_\_\_\_

#### PURPOSE OF STUDY

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#### PROCEDURES

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#### RISKS

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#### BENEFITS

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## **CONFIDENTIALITY**

Please do not write any identifying information.

Every effort will be made by the researcher to preserve your confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents
- Keeping notes, interview transcriptions, and any other identifying participant information in a locked file cabinet in the personal possession of the researcher.

Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

## **COMPENSATION**

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## **CONTACT INFORMATION**

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Researcher directly by telephone at \_\_\_\_\_ or at the following email address \_\_\_\_\_.

## **VOLUNTARY PARTICIPATION**

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Note: Please delineate the "Consent" section of the Informed Consent Form by drawing a line across the page (like this - Example). This delineation is important because the consent form grammar shifts from second person to first person, as shown in the example.

## CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

**Participant's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Researcher's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_