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Master in Business Administration (MBA)

Postgraduate Dissertation

Digital Transformation as a Strategic Tool for Business Competitiveness

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Digital Transformation as a Strategic Tool for Business Competitiveness

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Abstract

Over the past decades, due to the rapid technological advancements, the companies are drastically reshaping the way they operate, innovate and compete. Nowadays, digital transformation is inevitable and is the main factor for further innovation and growth of the firms.

Innovations such as data analytics, automation, Artificial Intelligence (AI), Internet of Things (IoT), Digital Marketing and other digital platforms help the businesses that have adopted them enhance performance, agility and achieve sustainable competitive advantage. Competitiveness among firms drives efficiency, innovation, and productivity and is crucial for their growth and resilience. The organizational enablers and barriers will be examined, as well as the impact on productivity, customer experience, innovation and overall efficiency of the companies.

This dissertation will combine theoretical frameworks via the collection of data from known sources as well as primary research through questionnaires distributed to the staff of firms of the private sector. It will be conducted mainly due to the fact that the digital technologies nowadays have evolved to the point where the biggest companies rely on them to stay ahead and gain a sustainable competitive edge.

Keywords

Digital Transformation, Strategic Management, Artificial Intelligence, Digital Marketing, Digital Platforms, Business Competitiveness

Περίληψη

Τις τελευταίες δεκαετίες, λόγω των ραγδαίων τεχνολογικών εξελίξεων, οι εταιρείες αναδιαμορφώνουν δραστικά τον τρόπο λειτουργίας, καινοτομίας και ανταγωνισμού τους. Στις μέρες μας, ο ψηφιακός μετασχηματισμός είναι αναπόφευκτος και αποτελεί τον κύριο παράγοντα για περαιτέρω καινοτομία και ανάπτυξη των επιχειρήσεων.

Καινοτομίες όπως η ανάλυση δεδομένων, ο αυτοματισμός, η Τεχνητή Νοημοσύνη (AI), το Διαδίκτυο των Πραγμάτων (IoT), το Ψηφιακό Μάρκετινγκ και άλλες ψηφιακές πλατφόρμες βοηθούν τις επιχειρήσεις που τις έχουν υιοθετήσει να βελτιώσουν την απόδοση, την ευελιξία και να επιτύχουν βιώσιμο ανταγωνιστικό πλεονέκτημα. Ο ανταγωνισμός μεταξύ των επιχειρήσεων οδηγεί στην αποτελεσματικότητα, την καινοτομία και την παραγωγικότητα και είναι κρίσιμος για την ανάπτυξη και την ανθεκτικότητά τους. Θα εξεταστούν οι οργανωτικοί παράγοντες και τα εμπόδια, καθώς και ο αντίκτυπος στην παραγωγικότητα, την εμπειρία των πελατών, την καινοτομία και τη συνολική αποδοτικότητα των εταιρειών.

Η παρούσα διατριβή θα συνδυάσει θεωρητικά πλαίσια μέσω της συλλογής δεδομένων από γνωστές πηγές, καθώς και πρωτογενή έρευνα μέσω ερωτηματολογίων που θα διανεμηθούν στο προσωπικό των επιχειρήσεων του ιδιωτικού τομέα. Η συγκεκριμένη διπλωματική διεξάγεται κυρίως λόγω του γεγονότος ότι οι ψηφιακές τεχνολογίες στις μέρες μας έχουν εξελιχθεί σε σημείο που οι μεγαλύτερες εταιρείες βασίζονται σε αυτές για να αποκτήσουν βιώσιμο ανταγωνιστικό πλεονέκτημα.

Λέξεις-κλειδιά

Ψηφιακός Μετασχηματισμός, Στρατηγική Διοίκηση, Τεχνητή Νοημοσύνη, Ψηφιακό Μάρκετινγκ, Ψηφιακές Πλατφόρμες, Ανταγωνιστικότητα Επιχειρήσεων

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Introduction

1.1 Brief Description

Digital transformation is the restructuring of a firm using digital tools continuously in order to create value, improve customer experience, and lower cost. A coherent digital transformation strategy that targets particular areas of a business and is enabled by required capabilities is vital for firms if their goal is to stay competitive and survive in the long run. Digital transformation is not a one-time project, but a continuous journey that the majority of business executives will have to go through during their careers (McKinsey and Company, 2024).

The continuous character of digital transformation arises from the fast pace of development of new technologies and their implementation into business. For instance, the ever-growing role of artificial intelligence (AI) in gaining business insights and making decisions implies that any digital transformation needs to be considered an AI transformation as well. (McKinsey and Company, 2024).

Environmental factors include external variables like competitive pressure, regulation, and market dynamics. Competitive pressure can be the source of motivation for digital transformation. The process of digital transformation refers to major transformations that take place within a company due to the use of new digital technologies that increase customer satisfaction and make operations more efficient and innovative. The technologies used include artificial intelligence, machine learning, big data analytics, and Internet of Things (IoT), which allow businesses to reengineer their processes and enhance their competitive advantages (Wroblewski, 2018; Straková et al., 2022). Environmental factors refer to external variables like competitive pressure, regulation and market dynamics that may affect digital transformations of organizations. Competitive pressures may be considered the source of motivation of companies, forcing them to innovate and adapt to maintain their competitive position.

1.2 Importance of the topic

The phenomenon of digital transformation has become wide-spread among companies. Digital transformation or “digitalization” is “*the integration of digital technologies into business processes*” (Liu et al., 2011). The use of digital technologies allows companies to merge products and services across functional, organizational, and geographical borders boundaries (Sebastian et al., 2017). As a consequence, due to the implementation of digital technologies the speed of change and transformations in various industries has been increased substantially (Bharadwaj et al., 2013; Ghezzi et al., 2015), as traditional approaches to conducting business have been changed and technological innovations have been made possible (Bharadwaj et al., 2013).

Therefore, digitalization has decreased the division between technology and management by offering new digital capabilities and concepts of the digital environment that are shifting radically the way companies react to managerial challenges, innovate, interact with stakeholders, and manage their operations (Verma et al., 2012; Bresciani et al., 2018)

1.3 Aims and objectives

This dissertation aims at presenting and evaluating the impact that digital transformation has on the firms by revealing the ways it has assisted them to grow and compete. It explores how digital technologies and appropriate technological infrastructure can achieve competitiveness for a company. Moreover, it critically analyzes digital transformation as a strategic tool for the firms. Finally, through the questionnaires, it is revealed if the staff of firms of the private sector believe that digitalization has assisted with the firms’ management and competitiveness.

1.4 Structure of dissertation

The dissertation is structured in seven chapters as follows:

Chapter 1 serves as an introductory chapter to the dissertation subject. The concept of digital transformation is defined, as well as the concept of business competitiveness. It presents the importance of this topic and the objectives of this research.

Chapter 2 provides a systematic literature review, covering the definition and the different digital technologies that support the digital transformation. It outlines the different strategies that can be used by the firms to achieve a sustainable competitive advantage. This chapter also examines the challenges and risks that the companies might come across during the digitalization process.

Chapter 3 includes the conceptual framework and the research hypotheses. It explores the key concepts, variables, relationships, and assumptions that guide this academic inquiry.

Chapter 4 presents the research methodology used in this dissertation. It outlines the questionnaires that are distributed to the staff of firms of the private sector. It analyzes the design, research questions, sampling approach, and quantitative analysis to ensure data reliability and validity

Chapter 5 includes the necessary statistical analysis of the questionnaires.

Chapter 6 interprets the results of the questionnaires. It synthesizes findings from both the literature review and the questionnaires to provide an understanding of the topic.

Chapter 7 concludes the dissertation by summarizing and discussing the main findings of the research.

After the main chapters, a reference list and an appendix section are provided.

2. Background and Definitions

2.1. Definitions

In order to properly comprehend the subject of this dissertation, it is crucial to know the definition of the following terms:

Digital transformation: Digital transformation, both as a business process and as a term describing IT-related organizational activities, has its roots in the mid-20th century. The appearance and evolution of the first computers and the shift from analog to digital content marked a turning point in technological progress.

The term of digitization dates back to 1954, referring to the conversion of analog data into digital format. This process entails the conversion of data kept in physical form to digital format. According to Boratyńska (2019), digitization involves representing information as '0' and '1', which computers use to store, process and transmit as information. Essentially, digitization is all about the transition from analog to digital activities, involving the integration of IT into present business processes. It facilitates the execution of these processes and can effectively affect resource costs (Verhoef et al., 2019; Khanra et al., 2020). Moreover, digitization can result in changes in the current business models to enhance value creation for all stakeholders involved (Heilig et al., 2017).

Digital transformation is the process of enhancing productivity, value generation and social well-being through the implementation of revolutionary technologies. It reshapes firms through the digitization of business processes with information systems (Imran et al., 2021). Digital transformation fundamentally changes business models, introduces new ways to monetize products and services, considerably impacts long-term savings in production and antecedes the process of digital optimization. Digital transformation also becomes the foundation for further digital optimization, with its degree of optimization becoming a ground for further innovation.

Digital transformation's objective is to increase the competitive position by constantly adopting large-scale technologies, with the ultimate goal of increasing user satisfaction and

decreasing expenses (Lamarre E. et al., 2023). Digital transformation involves incorporating new technological advancements into a company's products and strategies. In unstable organizational environments, digital initiatives offer new operational possibilities but also introduce risks, requiring immediate adaptation to manage new and complex technologies (Xu J., Youngyuan M., 2018).

The aim of digital transformation is about achieving better organizational efficiency and increased agility with an end goal of delivering greater value for all employees, users and shareholders (Accenture, 2023). By implementing advanced technologies like artificial intelligence and cloud computing, companies are capable to boost their growth and improve performance and gain a competitive edge (Marr, 2023). Enhancing efficiency and reducing costs are some of the main objectives of digital transformation, while technological advances enable organizations to combine current products and services in innovative ways to create new digital offerings (Moor, 2023).

Digitalization: Digitalization is a broader concept than digitization and became widely adopted several years after the term “digitization”. While digitization focuses on converting analog information into digital form, digitalization extends beyond this process by transforming existing production methods and business operations. Digitization is a socio-technical process that utilizes digital methods to ameliorate social and institutional contexts (Seth H. et al., 2020). In contrast, digitalization not only focuses on lowering the costs but also contains procedures that enhance the experience of citizens. (Verhoef P. C. et al., 2019).

Essentially, digitization refers to the conversion of analog technology to a digital form, whereas digitalization refers to the effect of digital technology on the current process – it defines the manner in which it converts the current business process (Verhoef P. C., 2021). Digitalization encompasses the integration and consumption of digital technologies, platforms, and services. The concept implies a digitally-oriented world, where digital optimization is regulated in order to ensure stability of the system, decrease production expenses, make effective usage of available resources, and build competitive advantage in the long-run. Achieving digital optimization provides the foundation for the digital transformation of the entire model of business activity. While digitalization drives changes in existing business and production activities, it also enables new ways of using modern technologies (Surender & Khan, 2022).

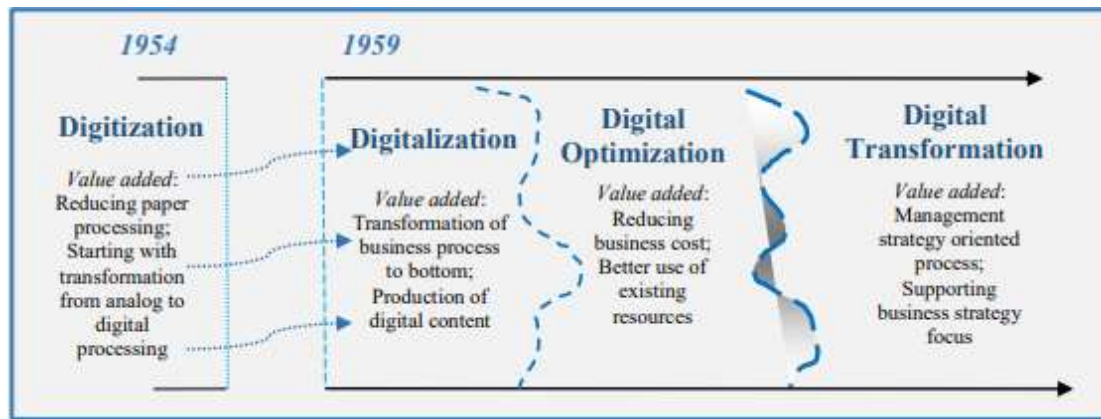


Figure 2.1.a: Digitization

(Source: Lozić, Fotova Cikovic, 2024)

Business Competitiveness: Business competitiveness has become a crucial factor for the advancement and survival of organizations. In an international context characterized by globalization, fast-paced technological advancement and growing financial instability, companies face the issue of preserving and improving their competitive position in increasingly dynamic and challenging markets (Halloui et al., 2022; Liao, 2021).

It has evolved beyond conventional factors such as costs and quality, to incorporate elements such as innovation, versatility, sustainability and human capital management (Bocken & Geradts, 2020; Kristoffersen et al., 2021). Digital transformation plays a vital role, with technologies such as artificial intelligence, big data and the Internet, reframing business models and value chains (Ghobakhloo & Fathi, 2020)

Business Strategy: A business strategy can be understood in several ways: as a planning document that is generated by the business on a regular basis, a process used to generate a plan, a broad concept explaining how an organization competes and interacts with stakeholders, or a deliberate set of actions designed to achieve long-term organizational objectives. A business strategy is both proactive and reactive, developing gradually over time. The effective crafting or development of strategy, combined with its successful implementation is considered to be effective management (Fleisher C. S., 2018)

Digital competitiveness: The digital economy and digital competitiveness are widely used terms for describing the socio-economic development perspectives of modern society. Digital

competitiveness is a complex, multidimensional structure that includes different aspects of the digital transformation process, such as the ability of learning and application of new technologies, the technological elements that enable digital transformation and digital readiness factors, which reflects how prepared both the economy and its citizens are to adopt these changes. (Stankovic et al., 2021).

In the following figure we can see the digital competitiveness method

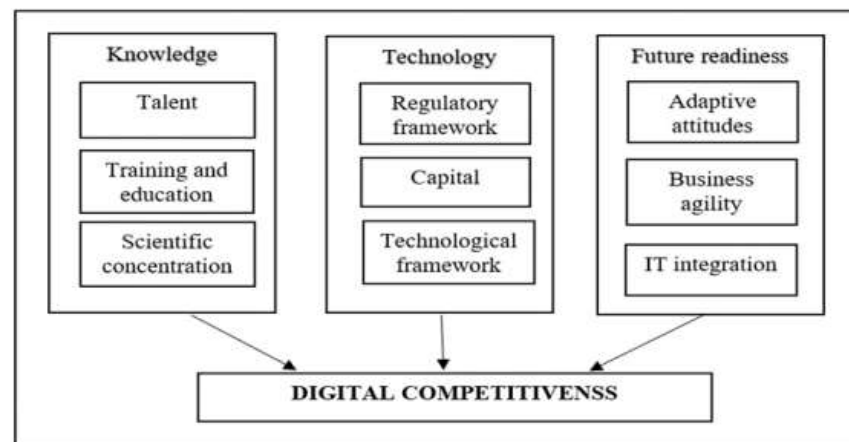


Figure 2.1.b: Digital Competitiveness Model

(Source: Martincevic, 2021)

Artificial Intelligence (AI): Artificial Intelligence (AI) refers to the branch of computer science and engineering focused on developing intelligent systems that support technological advancements. It imitates the functioning of human intelligence, although it does not necessarily follow biologically observable processes. AI55 can also be described as the study which deals with the analytical and algorithmic approaches to problem-solving through computational models. Its main objective is to incorporate up enhanced intelligence into a wide range of computer systems. (Mahato, 2022)

The definition of Artificial Intelligence (AI) has evolved over the years and continues to change. Kaplan and Haenlein define AI as “*a system’s ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation*” (Kaplan and Haenlein 2019). Poole and Mackworth describe AI as “*the field that studies the synthesis and analysis of computationalagents that act intelligently.*” (Pool and Mackworth, 2010). According to them, an intelligent agent acts appropriately according to its goals and circumstances, is flexible to changing environments

and changes its goals if needed, learns from experience and makes suitable choices despite perceptual or computational constraints. (Bartneck et al., 2021)

Similarly, Russell and Norvig define AI as *“the study of [intelligent] agents that receive precepts from the environment and take action. Each such agent is implemented by a function that maps percepts to actions, and we cover different ways to represent these functions, such as production systems, reactive agents, logical planners, neural networks, and decision-theoretic systems”* (Russell and Norvig 2010, p. viii)

Automation refers to the conversion of work processes, procedures, or equipment from manual human control to automatic operation. It involves more than simply replacing human functions with machines, as it requires a significant reorganization of the work procedure, during which both the human and the machine functions are restructured. While early forms of automation relied on mechanical and electromechanical control systems, computers gradually became the leading vehicle of automation over the past several decades. Modern automation is usually linked with computerization and digital technologies.

Automation is described as the use of technological systems and tools to function as substitutes for human actions and decisions (Nof, 2009). As organizations increasingly adopt automation, several forms of automation are required to fulfil the increased need for it.

One common type is fixed automation, which is based on rigid, hard-coded programming and cannot easily be modified or adapted. Other important forms of automation include:

- Programmable automation, which uses programmable logic controllers (PLCs) to automate control processes while allowing new programs to be added for different tasks.
- Integrated automation, where multiple automation technologies are combined into a single coordinated system.
- Business Process Automation (BPA), which automates repetitive and routine business processes through rule-based software programs.
- Robotic Process Automation (RPA), which uses software robots (BOTS) to simulate human actions and interact with other systems. (Rouse, 2024).

Digital marketing refers to the of products or services through digital technologies. It primarily takes place on the Internet. It also includes channels such as mobile devices, display advertising, and other forms of digital media.

Digital marketing encompasses all marketing activities that utilize electronic devices or the internet. Companies leverage digital platforms such as search engines, social media, email and websites to interact with both existing and potential customers. Often referred to as “online”, “internet”, or “web marketing”, digital marketing includes a range of digital methods and communication channels designed to reach consumers where they spend a significant amount of time—online. These strategies include websites, digital advertisements, email campaigns, online brochures, branding tools and many other digital marketing techniques that fall under the umbrella of “digital marketing”. (Desai, 2019)

The unique features of the digital environment and its appropriation for marketing have encouraged the development of new channels, formats and forms of communication, leading to innovative tools and strategies that would not be possible in traditional offline marketing. Nowadays, digital marketing is no longer viewed simply as a branch of conventional marketing, but rather as a distinct phenomenon that combines personalization with mass distribution in order to accomplish marketing objectives. (Pineiro-Otero, Martinez-Rolan, 2016)

Data analytics is the process of examining raw data to draw inferences about the available information. Data analysis techniques are mainly used to gain a deeper understanding that can further facilitate enhancement of the sector under consideration. These techniques help optimize processes, enhance overall system efficiency and reduce operational costs, thereby improving performance.

For organizations, data analytics plays a vital role in supporting better decision-making and understanding customer behavior, trends and satisfaction levels. This ultimately leads to the development of improved products and services, as well as more effective marketing strategies. Due to its wide range of benefits, data analytics is applied across many sectors and relies on various tools and technologies to perform analytical tasks. (Sayal, 2022)

ERP: The Enterprise Resource Planning (ERP) systems are integrated software solutions designed to unify an organization's core processes and functions in order to present a complete and coordinated view of the business from a single information and IT architecture. While most large organizations around the world have already adopted ERP solutions, small and medium-sized enterprises (SMEs) are also increasingly adopting them as they find it cost effective and essential for maintaining competitiveness. Although the extensive scope and close integration associated with modern ERP systems have emerged only in recent years, their origins can be traced back to large-scale packaged business software that has been widely used since the 1970s. (Klaus et al., 2000)

One of the major benefits of implementing ERP systems in organizations is the integration of various tasks and functionalities into a unified system. ERP also supports senior management in decision-making by providing different alternatives and showing the negative and positive outcomes associated with each option. ERP software is widely seen as a strategic tool that enables organizations to respond effectively to the demands and challenges of the current era that heavily depend on competition among organizations. By utilizing information systems such as ERP, organizations can strengthen their competitive advantage, enhance their productivity, adapt more efficiently to changing environments and periods of crisis, in such a way that encourages their growth and expansion. (AlBar et al., 2014)

2.2 Digital Transformation Objectives

The objectives of digital transformation represent particular goals that organizations want to achieve in order to enhance efficiency, innovation, and competitiveness. The most common objectives include the improvement of operational efficiency, reduction of expenses and process optimization through the implementation of digital technologies, as well as the strengthening of strategic alignment between organizational vision and information systems.

Other objectives include the adoption of innovative technology in order to increase agility, seek out novel solutions and enhance efficiency. It also aims to create a better experience for the customers, strengthen relationships and expand product and service offerings so as to ensure digital readiness and new business model creation. When aligned with organizational strategy,

such objectives would be useful in ensuring competitiveness and long-term sustainability. (Cavalcante et al., 2025)

According to Cavalcante's research, the results show that the highest-rated objectives were improving operational efficiency, adopting new IT, and reducing costs through technology. This suggests organizations prioritize immediate operational improvements in the early stages of digital transformation.

On the contrary, more transformative and market-oriented strategies — such as building new business models, creating new products or services and strengthening customer communication — were given lower scores. These goals emerge at later stages of digital maturity.

According to the above research, the statistical analysis demonstrates strong agreement among the participants about the efficiency and cost-related goals, while more innovative goals showed higher variance in responses. The open-ended feedback confirmed this pattern, by emphasizing priorities such as “improving internal communication”, “modernizing management platforms” and “increasing user trust”.

Overall, the findings suggest that organizations prioritize objectives with more immediate returns, associated with efficiency and internal modernization. Innovation and customer focus, although present, appear more moderate, indicating an approach that favors internal consolidation before exploring transformational opportunities.

2.3 Strategies that help achieve sustainable competitive advantage

Currently, digitalization is one of the most fundamental strategic challenges for both private and public organizations. Emerging technologies such as artificial intelligence (AI), machine learning, automation, smart technologies in materials and manufacturing, the Internet-of-Things (IoT) and cloud computing are shifting the way value is created, the organization and internal structure of the firms, as well as the interaction with external stakeholders. Consequently, the leaders of firms are facing a dual challenge, which includes both internal and external factors.

In order to manage digitalization, new competencies are required within both strategic and technology management. This means that leadership is facing new challenges. The pursuit of

digitalization not only requires new skills, but also impacts activities and actions undertaken in strategic work.

When digital technologies advance, they are revising the rules for strategy work in various aspects. Digital business strategy encompasses the changes companies undertake to create new or reconfigure existing value propositions and thereby gain a competitive advantage. This reveals that digital transformation is connected with strategy rather than just technology and this is the reason why leaders must manage the interlink between technological advancements and the expansion of new business models as a main focus of their strategy work (Warner and Wager, 2019).

According to the survey in 2025, the findings show that organizations that successfully incorporate digitalization into their strategic growth, they tend to prioritize the following five actions. They:

- discuss and communicate the vision and strategy
 - align resources and activities
 - ensure a continuous focus on operational improvements and efficiency
 - create an orientation toward customer or user needs and expectations
 - develop the competencies of top managers, middle managers and employees.
- (Kringelum et al., 2025)



Figure 2.2: Five strategic actions for digital transformation

(Source: Kringelum et al., 2025)

Based on the above figure, we can conclude to the following conclusions:

“Discuss and communicate the vision and strategy”

Effective communication is one of the biggest advantages a firm can have in order to successfully implement a digital strategy. Open discussions are crucial to ensure that every employee of the firm is familiar with the vision and strategy that have been adopted by the company. Also, a communication plan should be conceived that aligns the overarching ambitions of the organization. These steps will lead to a better understanding through increased employee motivation, they will promote greater participation, clear actions and the creation of consensus (Rapert et al., 2002).

According to the findings of this research, organizations that actively integrate digitalization into their strategy work tend to engage more widely in communication. This engagement is noticeable when firms involve employees in strategy development and are able to transform it into action plans at all levels of the firm. Furthermore, the findings show that when the employees at all levels of the company are familiar with the strategy, they are more inclined to adopt digitalization as part of their work. (Kringelum et al., 2025)

“Align resources and activities with the strategy”

Moreover, in order to achieve digital transformation, a significant allocation of resources is required. Leaders should pay close attention when ensuring the allocation of sufficient resources of the company. Digital transformation tends to directly affect the strategic content of the firm, since it could shift the value proposition or value creation process. *“As a consequence, managers must place their focus on aligning the internal context by leveraging existing resources and developing new resource configurations, as well as new processes. These changes are essential to align the internal context with the strategic content”*. (Correani et al., 2020).

Quite often, small and medium-sized companies, may face resource limitations that create serious challenges. In this case, the significance of managerial competencies to encourage the work is even greater.

“Develop employee, middle and top manager competencies”

As organizations need to stay aligned with customer expectations and the broader digital environment in which they operate, it is necessary that the role of the middle manager is reconsidered. This is crucial, since the digital transformation process involves everyone in the organization, whether they contribute intellectually or operationally (Volberda et al., 2021). Digital transformation often presupposes a meticulous revision of an organization’s activities and business models. This leads, without fail, to the emergence of new roles to be addressed and new digital transformation challenges that demand resolution. In order to take full advantage of digital opportunities, employees must develop the appropriate skills and capabilities (Kringelum et al., 2025).

The above-mentioned research highlights that digital transformation depends on organizational members possessing the competencies required to navigate strategic change. This is relevant for all hierarchical levels, including top management, middle management and employees. To begin with, referring to the top managers, their function is perceived as a key factor of success in organizational change. The top management is responsible for developing a clear digital vision and strategy, fostering engagement in the transformation process and continuously strengthening managerial skills—especially among middle managers.

The employees in a firm should have the digital competencies to support the strategic goals of the organization. This underscores the importance of digital literacy of the employees. The concept of digital literacy encompasses the knowledge, skills and abilities used by a social group or individuals while engaging with digital technologies (Kozanoglu and Abedin, 2021). Digital literacy signals the willingness of the employees for participating in digital transformation and therefore represents a vital dynamic capability of the company during the transformation process. It is crucial to consistently develop and enhance the digital competencies at both individual and collective levels.

“Ensure operational improvements and efficiency”

Strategic transformation driven by digitalization can follow either an offensive or a defensive approach. Choosing between these paths depends on numerous components, such as organizational barriers and inertia in the firm, causal uncertainty and the availability of financial resources for the transformation (Margiono, 2020). Determining the appropriate scale of change and the alignment with the present state of the company, is ultimately a leadership responsibility which requires deep insight into current operations, as well as a clear understanding of the organization’s future ambitions.

The planning and implementation of digital transformation require a careful balance between long-term strategic change and the management of everyday operations. As argued by Andriole and Barsky (2022), striving for this balance can potentially lead to conflicts in where an organization directs its attention. Placing excessive emphasis on operational efficiency may limit the digital strategy’s capacity to foster innovation and build the necessary competitive edge or advantage. Nevertheless, focusing on improving processes and efficiency lays the groundwork for effectively embedding digitalization into the organization’s strategy work.

Seeking to balance efficiency in existing activities and operations with the advancement of digital transformation necessitates maintaining oversight of the transformation process. This includes managing information effectively, resource distribution, an uninterrupted evolution of organizational structures and potential revision of strategic goals. Such measures support the development of structural, contextual, and leadership-driven ambidexterity (Wang et al., 2023).

“Create an orientation toward customer/user needs and expectations”

Organizations that integrate digitalization into their strategic planning prioritize a strong and continuous focus on customer and user needs. The digital revolution has accelerated the digitalization of market research, customer interaction and user participation across multiple industries. As a result, companies have developed products and services that enable easier access, greater customization, and more efficient interaction between companies and their customers (Correani et al., 2020). Within digital transformation efforts, reconsidering the business model is crucial for a company's value proposition, target markets, and value chain.

Digitalization has influenced corporate tactics and market approaches in four main areas: advertising products and services, executing business operations, enabling communication and information exchange, and managing resources (Cham et al., 2022). Technological advancements have also altered consumer patterns, particularly by embedding customers more directly into the procurement process.

The findings indicate that the firms that are making use of digitalization into their strategy work consistently conduct market analysis for determining future customer and user expectations. These insights are then actively used in the development of new products, services and internal processes to enhance customer or stakeholder value. Many companies from this study claim to have undergone significant transformations in customer value creation process within the last two years.

Digital interaction with customers and partners has impacted marketing and sales. It has also introduced new competitive elements and increased customer expectations. There is now a greater focus on service and customization (Martín-Peña et al., 2018). As Artificial Intelligence continues to create these opportunities, it is essential to align strategic efforts with a quickly evolving environment. Coordination requires advancements in technology, employee competencies as well as strong leadership, since it involves turning data into information and implementing new strategic initiatives.

Digital transformation is a procedure that transforms a company's strategy, structure, tactics and culture. The strategies that have been implemented tend to create a solid foundation for digital governance, setting priorities and adopting new initiatives. These strategies also contribute to developing trust among stakeholders and guiding the transformation journey with greater certainty. The strategic choices made depend on the company's goals, resources and

background and they must be adaptable and aligned with the company's level of digital maturity (Merten et al., 2024)

Furthermore, based on the existing literature some strategies for achieving digital transformation goals, such as refreshing business models, enhancing customer experience, optimizing operations through the use of data and building an innovation-driven culture. It is important to conduct a comprehensive review of existing technologies, creating roadmaps for technology and developing teams for making digital transformation motivations, objectives, and approaches effective. Not only does digital transformation strategies serve to communicate within the company, they are also strategic enablers in terms of making organizations transparent and credible. These strategies should reflect the firm's present stage and consider external factors.

2.4 Challenges of Digital Transformation

Research show that digital transformation faces various types of barriers in multiple in multiple different industries. In business contexts, studies prove that there are some difficulties arising from the process of digital transformation due to data security problems, lack of control, as well as poor integration with existing IT systems. Among the main obstacles of logistics service providers, there are challenges such us technology adoption problems, shortages of financial and skilled resources, complex logistics network structure, resistance to change as well as concerns about data protection. In addition to that, there could be more challenges such as limited organizational capabilities, technological constraints, goal ambiguity, skill mismatches and external pressures. Small service companies face similar problems, particularly with regard to insufficient digital capabilities, lack of qualified personnel, technical barriers and lack of funds.

When it comes to traditional companies, they usually run into a different set of barriers such as lack of clear vision, data security issues, organizational culture, inadequate skills, outdated infrastructure, tight budgets and lack of integration of systems across different departments of the company. Meanwhile, small and medium-sized enterprises frequently struggle with limited knowledge and scarce resources. Leadership challenges are also prominent, as managers often

lack the competencies required to operate effectively in digital environments. From a strategic management perspective, recurring problems include insufficient digital skills, the lack of integration between systems, budget limitations, and the implementation complexity.

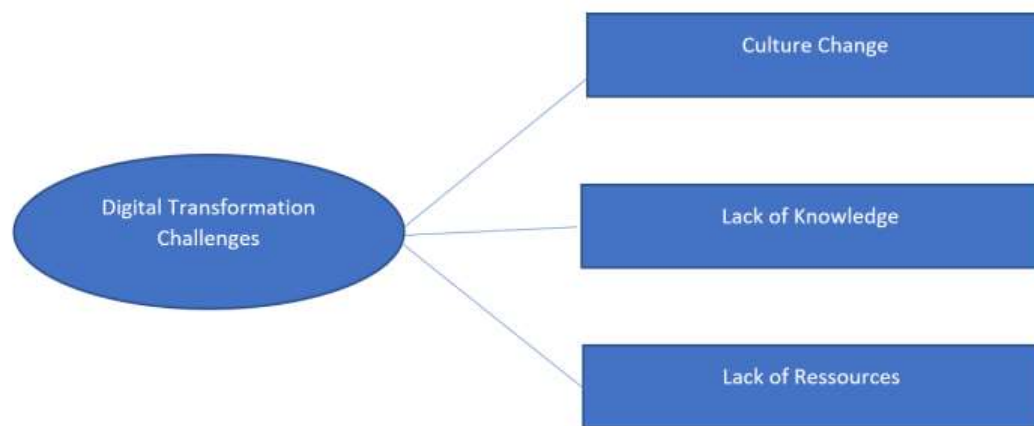


Figure 2.3.a: Main digital transformation challenges

(Source: Weerasingh and Nirere, 2022)

Investigating digital transformation challenges requires examining organizational change concepts, as the former goes in line with the latter. Using organizational culture insights can either facilitate or hinder change. For instance, when employees resist transformation, initiatives are more likely to fail. Leaders therefore are responsible when it comes to managing cultural resistance. Moreover, it is remarkable that upgrading digital systems may be relatively easier and straightforward, rather than altering employees' mindsets and behaviors is far more difficult. If individuals refuse to adapt, project coordination suffers, tasks remain incomplete, and transformation efforts may collapse.

The next challenge that needs to be mentioned in the discussion of digital transformation is related to the problem of knowledge. The success of the digital transformation process not only relies on information but also requires organizational knowledge. However, in many firms, critical knowledge is contained in employees rather than stored digitally. With that being said, if such experts quit the company, the organization could lose valuable knowledge. Therefore, it should be formalized and stored.

Additionally, limited resources, particularly those of skills, are another common problem that companies face. The firm has to upgrade itself from outdated technologies, invest in new

technologies and build its digital skills to cater for the requirements of transformation. Skill deficiencies pose serious threats to any digital strategy that an organization implements since lack of effective management and misallocation of tasks will jeopardize the projects. Furthermore, digital proficient staff will be far ahead compared to those with low or no digital skills. This implies that digital assets like digital expertise and leadership abilities need to be taken into consideration before making any digital investment. (Weerasingh L., Nirere B., 2022)

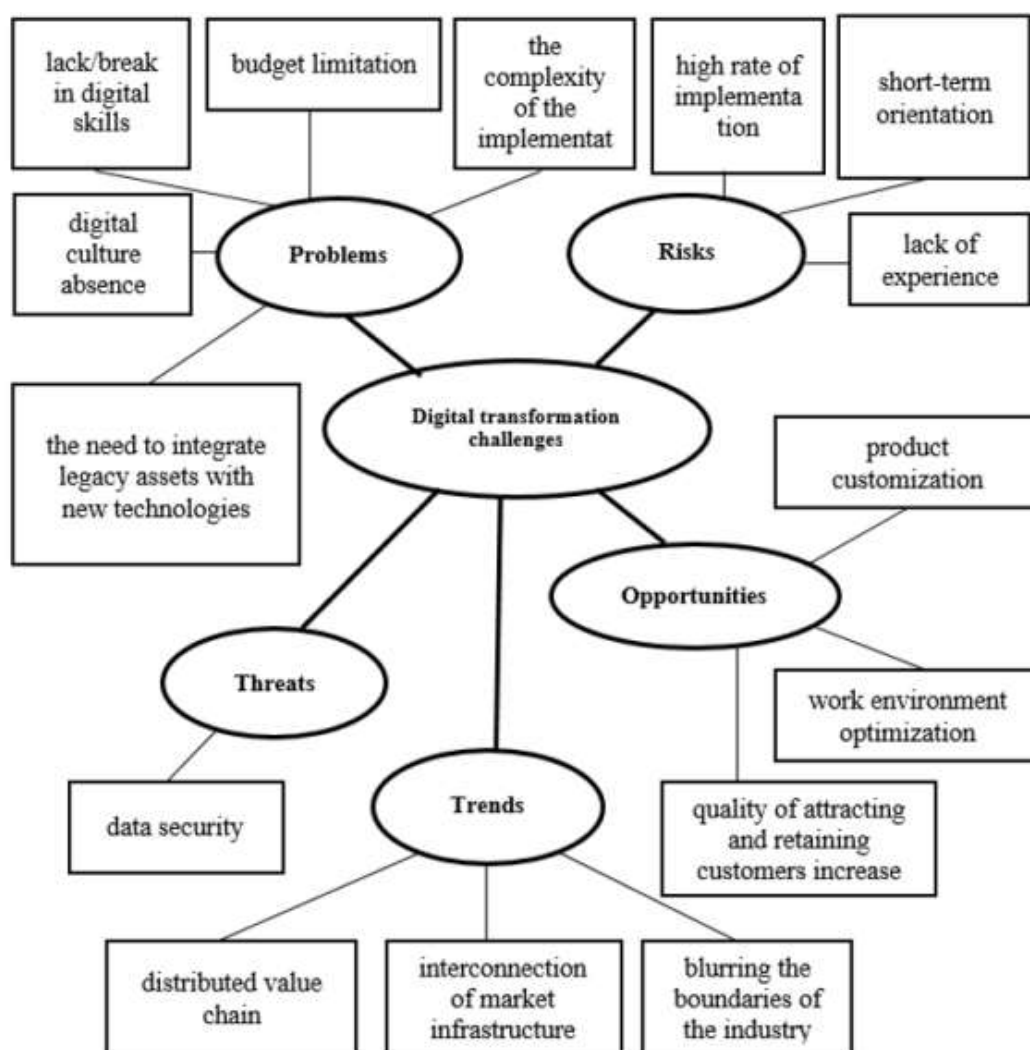


Figure 2.3.b: Digital transformation challenge map
(Source: Maksimenko et. Al, 2021)

In the figure above, we can see the problems, risks, threats, trends and opportunities the way Maksimenko describes them in her research.

According to their research, the problems of digital transformation, as analyzed in the previous paragraphs, include the lack in digital skills, the budget limitation, the complexity of the implementation and the digital culture absence.

The risks as explained in the research are the following:

- Short term orientation

The companies should avoid blindly beginning on digital transformation, as well as adding unnecessary technologies. They should also realize that this is not a one-time process. It's a continuous process that takes time, needs planning and resources.

- Lack of experience

Only a very small percentage of companies have adopted a strategy of corporate digital transformation. Most companies don't follow a corporate strategy or implementation plan,

- High rate of implementation

The capabilities of technologies such as Internet of Things (IoT), Big Data, Cloud computing are accelerating the overall pace of change. This fast and ever-ending digital environment is pushing managers to implement digital strategies faster than previously required.

As seen in the figure 2.3.b, the opportunities of digital transformation are the following:

- Product customization

Digital transformation has enabled the way companies receive customer feedback and the way they can utilize it. *It is possible due to hundreds of sensors aggregating data in real time. This dataset provides invaluable information to those responsible for product / service development* (Maksimenko et. al, 2021). This will result in better customer relationships and expanding brand reach.

- Work environment optimization

Adopting digitalization reshapes the work environment in companies in terms of work structure, job roles and workplace requirements. *“Digital collaboration enables flexible and networked teams to be built across multiple locations across a company's geographic map”* (Maksimenko et. al, 2021).

- Quality of attracting and retaining customers increase

Digital advancements are reshaping the activities of customer engagement tactics. Attracting customers nowadays requires digital omnichannel marketing, including social media, mobile apps, email to deliver a unified experience.

Furthermore, as Maksimenko analyzes in her research, digital transformation has the following trends:

- Distributed value creation

During digital transformation the value chain has become significantly more distributed. Two major changes stand out: first, digital technologies enable customers to actively participate in product creation alongside manufacturers, for example, through digital platforms. Second, value creation between companies is increasingly collaborative and reflected in a series of partnerships in value creation networks. As a result, it can be argued that network effects have emerged as a crucial factor behind the creation and capture in the digital economy. Thus, the focus from traditional value chains is shifting to value networks.

- Blurring the boundaries of the industry

Digital transformation is reshaping and blurring current industry boundaries. This leads, on one hand, to increased cross-industry competition – where the dominant industry no longer works, and even new small companies can become strong competitors. On the other hand, it drives digital convergence - where different network platforms merge to deliver similar types of services. From a supply perspective, digital convergence means multiple industries rely on the same knowledge base, while from a demand perspective, it erases the boundaries of markets.

- Interconnection of market infrastructure

The rise of digital platforms and networks has made market structures more interconnected, since there is a transition from control or participation in a linear value chain to work in an ecosystem or network. As innovation networks continue to evolve, firms should develop more flexible digital infrastructures capable of supporting these complex interactions and facilitating collaboration across networks. Thus, digital technologies contribute to greater diversity in the knowledge used across innovation networks. At the same time, we should mention that the ease with which digital products can be shared accelerates the destruction of property rights and heightens the risk of imitation.

Lastly, the main threat that is highlighted in Maksimenko's research is data security with several key areas of concern. First is cybernetics – the increasing number of connected devices with more advanced threat sources has increased the risk of cyberattacks significantly. Secondly, the adoption of cloud services, where the risks tied to operating systems in cloud environments continue to rise. Lastly, data privacy – the regulations and controls of personal information are becoming stricter and if they're not handled properly, they can undermine a firm's trust and reputation.

3. Conceptual framework and research hypotheses

Based on the previous literature review, we can base our expectations on the following hypotheses:

According to Cavalcante et al. (2025), operational efficiency is considered the most highly ranked goal among the goals of organizational digital transformation. Operational efficiency is one of the main factors through which the organization can start their digital transformation process. It allows the companies to see immediate benefits, which can then support the more comprehensive objectives of digital readiness, innovation and long-term sustainability. Improvements in the operational efficiency along with the adoption of IT innovations and cost reduction through technology can be useful for the customer experience improvement and product expansion.

Digital transformation implementation involves combining strategic changes over time and managing daily operations. As noted by Andriole and Barsky (2022), focusing too heavily on operational efficiency hinder the process of innovation and competitiveness. However, they also emphasize that process improvement and efficiency improvement are extremely important in order to create a solid basis for further digitalization.

Moreover, a number of researchers have shown that digital advancements have transformed business models through enhancing efficiency in operations and management systems as well as through providing innovative ways to interact with customers. By implementing digital technologies, companies can become flexible and utilize the available resources in an efficient manner (Kothapalli, 2022). Additionally, there is no doubt that automation leads to increased productivity because of fewer repetitive tasks. (Ying & Addimulam, 2022)

Hypothesis 1 (H1): The adoption of digital transformation practices is positively associated with the improvement of a firm's operational efficiency.

The concept of digital transformation entails a change in the company's strategy, structure, processes, and culture. The firm's strategic decisions will depend on its goals and resources of the organization and should be flexible and compatible with the company's digital maturity

level (Merten et al., 2024). The company's digital maturity has a direct impact on its digital transformation strategy, making sure that initiatives are achievable, resourceful and capable of reaching long-term goals.

The level of digital maturity of the company plays an important role in determining the strategy of the transformation process. Digital maturity determines the way a firm resolves organizational, informational, technological and cultural issues of digital transformation. The higher the maturity level, the better the organization copes with the digital age.

Hypothesis 2 (H2): The level of digital maturity of a firm positively influences its competitive position in the market.

Digital transformation is about change within companies, due to the implementation of digital technologies that help increase performance, efficiency, foster innovation and enhance the customer experience. By utilizing technologies including Artificial Intelligence (AI), Machine Learning (ML), big data, and the Internet of Things (IoT), it is possible for firms to completely restructure and redesign their operations and gain competitive advantage. (Wroblewski 2018, Straková et al. 2022).

Additional key goals include the introduction of new technologies to modernize operations, enhance agility and support innovation. It also focuses on improving the level of customer satisfaction through building stronger relations and offering more products and services. Other key objective includes improving the level of digital readiness of the organization and development of innovative business models. If these goals are in accordance with the organizational strategy, they will help improve the competitive position of the company. (Cavalcante et al., 2025)

According to Cavalcante's research, the findings indicate that the highest-rated objectives were enhancing operational efficiency, implementing new IT solutions and reducing costs through technology. This suggests that organizations prioritize immediate operational improvements during the initial phases of digital transformation.

As digital technologies evolve, they reshape the way strategic activities are carried out in several aspects. Digital business strategy encompasses the transformations organizations implement to develop new value propositions or adapt existing ones and thereby gain a competitive advantage. This reflects that digital transformation is closely tied to strategy, not

merely technology and this is the reason why leaders must manage the connection between technological progress and the expansion of new business models as a main focus of their strategic efforts (Warner and Wager, 2019).

Hypothesis 3 (H3): The strategic alignment between digital transformation and business strategy enhances long-term organizational performance.

Given that the companies strive to stay on par with their customer expectations and the overall digital environment around them, the role of middle management should be revisited. The importance of doing so lies in the fact that the process of digital transformation impacts everyone in the company, either strategically or operationally (Volberda et al., 2021). Additionally, digital transformation usually implies a complete reconsideration of organizational operations and business models. This inevitably results in the appearance of new roles that require attention and new challenges in terms of digital transformation. To make use of the opportunities that lie in the field of digitalization, employees should have the required skills and competences (Kringelum et al., 2025).

Moreover, conducted researches show that employee performance can be affected both directly and indirectly. Studies indicate that through the introduction of digital technology and automation, efficiency in carrying out the assigned tasks has increased, resulting in the reduction of employees' workload since repetitive processes become automated. In addition to this, digital transformation has also been found to increase productivity especially where employees are equipped with digital skills and training to perform well in a digital environment. However, it should be noted that even though digital transformation positively impacts the performance of employees, the degree of impact varies depending on aspects such as organizational readiness, training quality provided to employees and organizational culture (Grace T. et al., 2025).

Hypothesis 4 (H4): Digital transformation positively affects employees' skills, performance, and engagement.

The companies are often faced with the need to upgrade their old systems, invest in new software and acquire digital skills for the transformation. The absence of the requisite skills might negatively impact the process, while ineffective management or poor task distribution

may delay or derail projects. Moreover, discrepancies between digitally literate and illiterate employees might further widen gaps within the firm. Therefore, it is crucial to take into account such intangible resources as the skills of the workforce and management in order to make the right decisions regarding the digital investment. (Weerasingh L., Nirere B., 2022)

Furthermore, numerous researches suggest that investments in digital technologies become new possibilities for growth and enhanced competitiveness. By using digital technologies, companies have the opportunity to reshape their value proposition and optimize the business processes, which helps to achieve integration and collaboration within the value chain. These investments support the IT capabilities and business processes, enhance the performance of the business support functions and encourage innovation. (Nwankpa & Merhout, 2020)

Hypothesis 5 (H5): Investments in digital technologies positively contribute to product and service innovation.

Firms that implement digitalization into their strategic planning tend to place emphasis on understanding and addressing customer and user needs. The digital revolution has accelerated the digital transformation of market research, customer relationship building and user involvement in different sectors. As a result, companies have developed products and services that provide better access to customers, greater customization and more enhanced interactions between firms and their customers (Correani et al., 2020). When it comes to digital transformation strategies, revisiting the business model is fundamental in defining value propositions and value chains.

Additionally, one of the main goals of many firms is to build strong relations with customers, to increase customer orientation and improve marketing and financial performance of the company. The implementation of disruptive digital technologies has changed the nature of consumer engagement with businesses and decision-making. Customers nowadays are more likely to interact with companies via social media and other digital platforms and to participate in two-way communication. (Huseynli, 2022)

Hypothesis 6 (H6): The implementation of digital transformation improves customer experience, which in turn enhances business competitiveness.

4. Research Methodology

A structured questionnaire was developed based on the six research hypotheses outlined in the previous chapter. The questions were selected after following a thorough review of the relevant literature and a critical examination of questionnaires used in prior studies addressing similar variables. Additionally, several extra questions were included to ensure a more comprehensive coverage of the research topic.

The questionnaire was initially created in English, as HOU's MBA program is taught in English. Afterwards, to accommodate the primarily Greek-speaking respondents, the questions were translated into Greek. The Greek questionnaire was then inserted into a Google Form, in order to be electronically distributed to individuals currently employed in various sectors to gather their responses.

4.1 Questionnaire design and structure

The dissertation's structured questionnaire included seven main sections along with an introductory section. The introductory part provided the title of the study, explained the purpose of the dissertation, including information about what it involved and why it was being carried out. It also expressed appreciation to all participants who voluntarily and anonymously completed the questionnaire. In addition, it stated who should answer the questionnaire as well as how much time it would approximately take them to complete it.

The questionnaire was divided into the following seven sections:

- Section A: Entitled “Demographic Data and Occupational Position”. This section gathered information related to the participants’ demographic characteristics and their occupational roles.
- Section B: Entitled “Operational Efficiency”. This section aimed to provide an overview of how the respondents’ firm efficiently operate while using digital technologies.
- Section C: Entitled “Competitiveness”. This section collected data regarding the competitive advantage the respondents’ firms may have.
- Section D: Entitled “Organizational Performance”. This section consisted of questions related to the business strategies and performance of the respondents’ firms.
- Section E: Entitled “Workforce”. This section focused on the employees’ engagement and productivity.
- Section F: Entitled “Digital Investments”. This section provided information about the respondents’ firms digital investments and how these investments have contributed to innovation.
- Section G: Entitled “Customer Experience”. This section gave emphasis on the customer experience of the respondents’ firms and the way it affected the firms’ competitiveness.

The complete questionnaire, including both the English and Greek versions along with their introductory texts, is provided in the Appendix.

The following table provides the main sections of the questionnaire:

Section	Factor/Variable	Number of questions	Measuring scale	Sources (after necessary modifications, adjustments and additions)
A	Demographic Data and Occupational Position	11	-	
B	Operational Efficiency	5	5-point Likert scale	Cavalcante et al., 2025 Andriole & Barsky, 2022 Kothapalli, 2022 Ying & Addimulam, 2022
C	Competitiveness	5	5-point Likert scale	Merten et al., 2024
D	Organizational Performance	5	5-point Likert scale	Wroblewski, 2018 Straková et al., 2022 Cavalcante et al., 2025 Warner & Wager, 2019
E	Workforce	5	5-point Likert scale	Volberda et al., 2021 Kringelum et al., 2025 Grace T. et al., 2025
F	Digital Investments	5	5-point Likert scale	Weerasingh L., Nirere B., 2022 Nwankpa & Merhout, 2020
G	Customer Experience	9	5-point Likert scale	Correani et al., 2020 Huseynli, B. 2022
Total number of questions:		45		

Table 4.1: Questionnaire structure and sources

4.2 Data collection

Participants were recruited primarily through snowball sampling, a widely used method in which respondents are encouraged to share the questionnaire with additional participants. Due to the large number of personal and professional contacts, a large initial group of respondents was reached. These participants voluntarily contributed by forwarding the questionnaire to their own personal and professional contacts and encouraging further distribution. Since the questionnaire was circulated through various channels, including email, SMS, Viber groups and other social media platforms, it was not possible to determine the total number of individuals were invited to respond to the questionnaire.

The questionnaire was available from May 2 to May 5, 2026, during which a total of 135 individuals took part in the survey.

5. Data analysis

5.1 Introduction

In total 135 answers were gathered through the electronically distributed questionnaire. The questionnaire was completed by individuals currently employed in various sectors.

5.2 Sample characteristics

The following paragraphs present the information collected from the first section of the questionnaire, which included demographic details and general questions regarding the participants and their companies. All results presented below were analyzed using IBM SPSS statistical software, Version 26.

The majority of the respondents were women (86 out of 135), meaning that only 49 men answered the questionnaire.

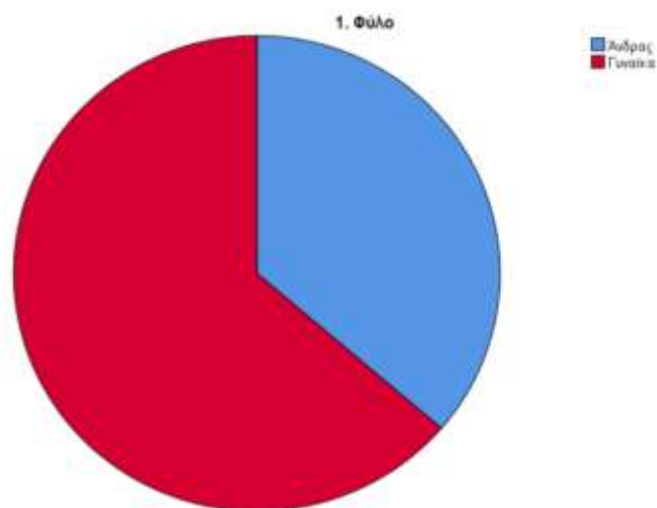


Figure 5.2.a: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
18-24	19	14,1	14,1	14,1
25-34	23	17,0	17,0	31,1
35-44	31	23,0	23,0	54,1
45-54	51	37,8	37,8	91,9
55-64	11	8,1	8,1	100,0
Total	135	100,0	100,0	

Table 5.2.a: Age

Regarding the higher completed educational level of the respondents, most of them (34,8%) have a bachelor's, while some of them (28,1%) hold a master's degree. (Table 5.2b).

	Frequency	Percent	Valid Percent	Cumulative Percent
Secondary level	22	16,3	16,3	16,3
Post-secondary level	28	20,7	20,7	37,0
Bachelor's degree	47	34,8	34,8	71,9
Master's degree	38	28,1	28,1	100,0
Total	135	100,0	100,0	

Table 5.2.b: Higher completed educational level

As far as the residential area of the participants is concerned, the majority of them (67,4%) are living in the region of Attica, while 11 of them (8,1%) are living in Thessaloniki. It is also worth mentioning that the questionnaire was also answered by 1 Greek participant living abroad (in the Netherlands).

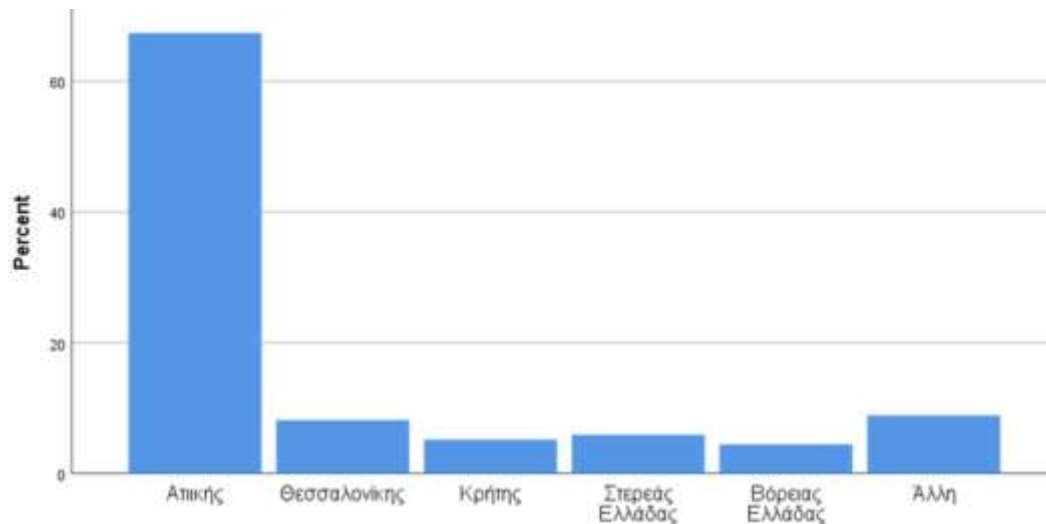


Figure 5.2.b: Place of residence (District)

Based on the following tables, the vast majority of the participants (88,9%) are full time employees mainly working as administrative personnel (45,2%). Most of the respondents work in the public sector (53,3% or 72 out of 135) and a large number of them (59 participants or 43,7%) work in a private company.

	Frequency	Percent	Valid Percent	Cumulative Percent
Full-time	120	88,9	88,9	88,9
Part-time	10	7,4	7,4	96,3
Occasional	3	2,2	2,2	98,5
Other	2	1,5	1,5	100
Total	135	100	100	

Table 5.2.c: Employment status

	Frequency	Percent	Valid Percent	Cumulative Percent
Manager	12	8,9	8,9	8,9
Administrative personnel	61	45,2	45,2	54,1
Working personnel	54	40	40	94,1
Other	8	5,9	5,9	100,0
Total	135	100,0	100,0	

Table 5.2.d: Occupational position

	Frequency	Percent	Valid Percent	Cumulative Percent
Private company	59	43,7	43,7	43,7
Non-governmental organization	4	3	3	46,7
Public sector company	72	53,3	53,3	100
Total	135	100	100	

Table 5.2.e: Type of company/organization

The next tables (Table 5.2.f and Table 5.2.g) provide an overview of the size of the companies and the industry sector of the participants. As we can see, most of the respondents (39,3%) work in relatively small companies of 10-50 employees. However, 23,7%– which translates to 32 participants - work in companies with over 500 employees. Additionally, 17,8% of the respondents work in the financial services sector and 17% of the participants work for Local Government Organizations. Only 1,5% of the respondents work in the construction sector.

	Frequency	Percent	Valid Percent	Cumulative Percent
<10	15	11,1	11,1	11,1
10-50	53	39,3	39,3	50,4
51-250	13	9,6	9,6	60,0
251-500	22	16,3	16,3	76,3
>500	32	23,7	23,7	100,0
Total	135	100,0	100,0	

Table 5.2.f: Size of company/organization

	Frequency	Percent	Valid Percent	Cumulative Percent
Education	8	5,9	5,9	5,9
Hospitality (accommodation, food services)	7	5,2	5,2	11,1
Financial services	24	17,8	17,8	28,9
Information Technology & Telecommunications	7	5,2	5,2	34,1
Healthcare	16	11,9	11,9	45,9
Media & entertainment	3	2,2	2,2	48,1
Transportation	4	3,0	3,0	51,1
Manufacturing/industrial sector	7	5,2	5,2	56,3
Construction sector	2	1,5	1,5	57,8
Local Government Organization	18	13,3	13,3	71,1
Public sector	23	17,0	17,0	88,1
Commercial sector	5	3,7	3,7	91,9
Other	11	8,1	8,1	100,0
Total	135	100,0	100,0	

Table 5.2.g: Industry sectors

5.3 Operational Efficiency

The next part of the questionnaire refers to the operational efficiency due to digital transformation practices. This section includes 5 questions. The results of the descriptive analysis are presented for each question in Table 5.3

	B1. Your company has integrated digital technologies into core operational processes.	B2. Digital technologies have reduced the time required to complete processes.	B3. The use of digital systems has improved your company's productivity.	B4. Digitalization has contributed to a reduction in operational errors.	B5. Implementing digital transformation has increased overall operational efficiency.
Mean	3,93	3,78	3,84	3,60	3,77
Std. Deviation	,878	,789	,693	,794	,680

Table 5.3: Operational Efficiency

It is observed that the mean score of all 5 questions is above the mean point 3 (neither disagree nor agree), that is on the positive side of the scale. The results indicate that respondents generally have a positive perception regarding the contribution of digital technologies to their companies.

In particular, the statement B1 (“The company has integrated digital technologies into its core operational processes”) received the highest mean score ($M = 3.93$, $SD = 0.878$), indicating a rather high level of agreement among participants. This suggests that majority of the companies have already integrated digital technologies into their operational processes.

Another highly rated statement is B3 (“The use of digital systems has improved the company’s productivity”) whose mean score is 3.84 ($SD = 0.693$). This shows that respondents believe digital systems have a positive impact on productivity. The low standard deviation testifies to the consistency of responses.

Similarly, the mean scores for statements B2 (“Digital technologies have reduced the time required to complete processes”) and B5 (“The implementation of digital technologies has increased the operational efficiency of the company”) are 3.78 and 3.77 respectively, suggesting a moderate to high level of agreement regarding the benefits of digital transformation on operational performance.

Finally, the statement B4 (“Digitalization has contributed to a reduction in operational errors”) had the lowest mean score ($M = 3.60$, $SD = 0.794$). The score indicates that although the respondents acknowledge the decrease in operational mistakes, their attitudes are somewhat more neutral than in relation to other aspects.

Overall, the responses are quite consistent, since the standard deviation values are rather low (less than 1). In this case, the standard deviation varies from 0.680 to 0.878, indicating a relatively low dispersion of responses and therefore a satisfactory level of consensus among participants.

5.4 Competitive Position

The next part of the questionnaire refers to the competitive position and more specifically how the level of digital maturity of a firm positively influences its competitive position in the market. This section also included 5 questions.

	C1. Your company has a clear digital transformation strategy.	C2. The level of digital maturity in your company is higher than that of your competitors.	C3. The digital capabilities of your company strengthen your market position.	C4. The technological advantage of your company provides a competitive edge.	C5. Digital transformation has improved your company's competitiveness.
Mean	3,27	3,01	3,50	3,24	3,47
Std. Deviation	,924	1,004	,937	,926	,888

Table 5.4: Competitive position

The results as presented in table 5.4 indicate a moderately positive perception among respondents regarding the strategic role of digital transformation in enhancing competitive advantage.

Among the evaluated statements, C3 (“The digital capabilities of your company strengthen your market position”) received the highest mean score ($M = 3.50$, $SD = 0.937$), meaning that

respondents believe that the digital capabilities help their companies enhance the market positions.

Likewise, the statement C5 (“Digital transformation has improved your company’s competitiveness”) achieved a relatively high mean value ($M = 3.47$, $SD = 0.888$). This score proves that participants perceive digital transformation as a factor that has helped the company become more competitive.

The statement C1 (“Your company has a clear digital transformation strategy”) got a relatively low mean value ($M = 3.27$, $SD = 0.924$). This means that despite the fact that some companies seem to have developed a digital transformation strategy, the agreement rate is not particularly high.

The statement C4 (“The technological advantage of your company provides a competitive edge”) also received an average level of agreement ($M = 3.24$, $SD = 0.926$). This result indicates that the people who participated somewhat recognize technology as a source of competitive advantage.

Finally, the statement C2 (“The level of digital maturity in your company is higher than that of your competitors”) showed the lowest mean value ($M = 3.01$, $SD = 1.004$). This means that respondents show a relatively neutral attitude towards whether their companies outperform their competitors in terms of digital maturity. Moreover, the high standard deviation indicates that there is greater variation in respondents' attitudes to this question.

Overall, the values of standard deviations lie between 0.888 and 1.004. This shows that there is a medium-to-high level of dispersion of respondents' attitudes. Thus, although respondents tend to have relatively positive perceptions of the strategic importance of digitalization, there is less consensus compared to the previous set of questions.

5.5 Organizational Performance

The next section of the questionnaire refers to organizational performance and how it is enhanced by the strategic alignment between digital transformation and business strategy. In this section the respondents had to answer 5 questions.

	D1. Digital transformation is fully aligned with your company's overall business strategy	D2. Digital investments support long-term organizational goals.	D3. Management integrates digital transformation into strategic decision-making.	D4. Strategic use of technology has improved the financial performance your company.	D5. Aligning strategy and technology contributes to sustainable business growth.
Mean	3,27	3,51	3,40	3,47	3,73
Std. Deviation	,956	,880	1,016	,896	,803

Table 5.5: Organizational Performance

According to table 5.5, we can see that the statement D1 (“Digital transformation is fully aligned with your company’s overall business strategy”) obtained a moderate mean value ($M = 3.27$, $SD = 0.956$). The mean score shows a moderate level of respondents’ agreement. The score implies that the connection between digital transformation and business strategy might not yet be fully developed in the organization. The standard deviation of 0.956 indicates moderate difference of opinions between the respondents, implying that employees had various views concerning the way digital transformation aligned with business strategy.

The statement D2 (“Digital investments support long-term organizational goals”) obtained a high mean score ($M = 3.51$, $SD = 0.880$) indicating that respondents generally agreed that investments in digital technologies help reach organizational objectives. The standard deviation of 0.880 implies a moderate degree of variability in responses. Even though most respondents positively evaluated digital investments, some of them might have had doubts concerning their effectiveness in the long term.

The statement D3 (“Management integrates digital strategic decision-making”) received a mean score of 3.40 and a standard deviation of 1.016. The mean score indicated the moderate level of agreement among respondents on the fact that management applies digital transformation in their decision-making process. Moreover, the standard deviation of 1.016 is the highest among all variables in this section and it shows the relatively high level of variability of respondents' views.

The statement D4 (“Strategic use of technology has improved financial performance”) achieved a relatively high mean score ($M = 3.47$, $SD = 0.896$). The mean score indicates the moderate level of agreement among respondents on the fact that the strategic usage of

technology has a positive impact on the financial performance of the firm. The standard deviation of 0.896 reflects moderate variability in responses.

The statement D5 (“Aligning strategy and technology contributes to sustainable business growth”) had the highest mean score within this section ($M=3.73$, $SD=0.803$). This shows that the respondents agree that there should be strategic alignment between business objectives and technology in order to sustain the business growth. The high mean score demonstrates that the respondents view technology as more than just a tool of operation, rather than an asset that promotes business sustainability and development. The standard deviation of 0.803 indicates relatively consistent responses among participants. This lower variability suggests stronger consensus regarding the importance of aligning technology with organizational strategy.

5.6 Operational Engagement (Workforce)

The next part of the questionnaire refers to the Operational Engagement (Workforce) and more specifically how digital transformation affects employees’ skills, performance and engagement. This section also consists of 5 questions.

	E1. Digital transformation initiatives implemented in your company have improved employee productivity.	E2 Training and development in digital skills increases employee engagement and satisfaction.	E3. Adoption of digital tools has enhanced communication and collaboration among employees	E4. Employees with higher digital literacy contribute more effectively to achieving strategic business goals.	E5. Digital workflows in your company have reduced employee turnover.
Mean	3,61	3,81	3,52	3,98	3,02
Std. Deviation	,773	,728	,752	,868	,805

Table 5.6: Operational Engagement (Workforce)

According to table 5.6, the results reveal that for statement E1 (“Digital transformation initiatives implemented in your company have improved employee productivity”) has quite a high mean score ($M = 3.61$, $SD = 0.773$). This shows that most respondents agreed that digital transformation initiatives contribute positively to employee productivity. Since the mean is quite higher than the middle point of the scale, it suggests that employees consider digital technology, systems and automated processes as tools that enhance their productivity. With the

standard deviation of 0.773, there was a moderate level of disagreement in the opinions of the participants regarding the influence of digital transformation on the improvement of productivity.

The statement E2 (“Training and development in digital skills has increased employee engagement and satisfaction”) received a high mean score ($M = 3.81$, $SD = 0.728$). This indicates strong agreement among the participants about the positive impact of digital skills training on the engagement and job satisfaction of the employees. The standard deviation of 0.728 is the lowest among all variables, indicating relatively high consistency in respondents’ opinions. This implies that most participants shared similar views regarding the positive impact of digital training and development.

The statement E3 (“Adoption of digital tools has enhanced communication and collaboration among employees”) recorded a mean score of 3.52 and a standard deviation of 0.752. The mean score indicates that respondents agree that the adoption of digital tools improves communication and collaboration within the company. The standard deviation of 0.752 shows moderately consistent responses. The majority of the participants have positive views about digital tools, however there is some variation in opinions that depends on employees’ technological knowledge and organizational communication practices.

The statement E4 (“Employees with higher digital literacy contribute more effectively to achieving strategic business goals”) received a high mean score ($M = 3.98$, $SD = 0.868$), which indicates high level of agreement among respondents about the role of digital literacy in the success of a company. This means that digital literacy is considered an important skill in firms. The standard deviation of 0.868 is the highest among the variables, indicating slightly greater variation in respondents’ opinions.

Finally, the statement E5 (“Digital workflows in your company have reduced employee turnover”) recorded the lowest mean score out of all statements ($M = 3.02$, $SD = 0.805$). This suggests that respondents were relatively neutral or somewhat agreed that digital workflows have some influence on reducing employee turnover. The low mean score could be seen as evidence that other organizational issues have much more impact on reducing employee turnover than digitization itself. These organizational issues include salary, leadership style, work environment, promotion opportunities, and organizational culture. The standard deviation

of 0.805 indicates moderate variability in responses, which means that opinions differed among respondents regarding the relationship between digital workflows and employee retention.

5.7 Digital Investments (Innovation)

The next part of the questionnaire refers to the Digital investments (Innovation) and more specifically how investments in digital technologies might contribute to product and service innovation. This section includes 5 questions.

	F1. Your company systematically invests in new digital technologies	F2. Digital technologies have led to the development of new products or services.	F3. Technology facilitates the creation of innovative solutions.	F4. The use of data analytics contributes to innovation.	F5. Digital investments have enhanced your company's ability to innovate.
Mean	3,30	3,52	4,01	4,03	3,54
Std. Deviation	1,001	,961	,773	,712	,780

Table 5.7: Digital investments (Innovation)

The statement F1 (“Your company systematically invests in new digital technologies”) received a medium mean value ($M = 3.30$, $SD = 1.001$). The medium mean implies the existence of the medium level of agreement between respondents concerning the systematic investment in new digital technologies by their firms. The standard deviation of 1.001 is the highest among all the variables measured. This indicates that there was a high level of discrepancy in views of respondents.

The statement F2 (“Digital technologies have led to the development of new products or services”) recorded a mean score of 3.52 and a standard deviation of 0.961. The mean implies the existence of a medium and rather high level of agreement between respondents concerning the role of digital technologies in the creation of new products and services. It seems like respondents agree that digital transformation is an important driver of product innovation and service improvements. The standard deviation of 0.961 indicates moderate variability among

responses. Despite the fact that many respondents agreed with the statement, there were still noticeable differences in perception.

The statement F3 (“Technology facilitates the creation of innovative solutions”) received a high mean score ($M = 4.01$, $SD = 0.773$). This shows strong agreement among respondents that technology facilitates the creation of innovative solutions. This is one of the highest-rated variables in the dataset, demonstrating that respondents clearly recognize technology as a key enabler of innovation within organizations. The standard deviation of 0.773 is relatively low, indicating a high level of consistency among respondents’ opinions. This suggests broad consensus across participants regardless of their organizational background.

The statement F4 (“The use of data analytics contributes to innovation”) achieved the highest mean score in the dataset ($M = 4.03$, $SD = 0.712$). This indicates strong agreement that the use of data analytics contributes significantly to innovation. This finding demonstrates that respondents perceive data analytics as one of the most important technological capabilities supporting organizational innovation. The standard deviation of 0.712 is the lowest among all variables, indicating very high consistency in responses. This means that respondents largely shared similar views regarding the importance of data analytics in driving innovation. The low variability strengthens the reliability of this finding and suggests widespread recognition of analytics as a valuable innovation tool.

Lastly, the statement F5 (“Digital investments have enhanced your company’s ability to innovate.”) received a mean score of 3.54 and a standard deviation of 0.780. These results indicate that respondents generally agree that digital investments have enhanced their company’s ability to innovate. This suggests that investments in digital infrastructure, technologies, and systems are perceived as positively influencing organizational innovation capabilities. The standard deviation of 0.780 indicates relatively low variability among responses, showing a fairly strong level of agreement across participants. Although opinions varied slightly, most respondents shared the perception that digital investments contribute positively to innovation outcomes

5.8 Customer Experience

The last part of the questionnaire refers to the customer experience and how it is affected by the implementation of digital transformation. This section includes 9 questions.

	G1. Digital technologies have improved the quality of customer service	G2 Your company uses digital channels for effective customer communication	G3. Your customers report high levels of satisfaction with our digital services	G4. Digitalization has improved response times to customer requests	G5. Use of digital customer service tools enhances customer loyalty
Mean	3,88	3,58	3,41	3,81	3,52
Std. Deviation	,847	1,033	,831	,821	,742

	G6. Personalized digital experiences improve the perceived value of your company's products/services.	G7. Leveraging digital channels has increased customer retention rates.	G8. Improved customer experience has strengthened your company's competitive position.	G9. Your company maintains a market advantage due to its digital capabilities.
Mean	3,69	3,54	3,61	3,39
Std. Deviation	,728	,770	,855	,914

Table 5.8: Customer experience

The statement G1 (“Digital technologies have improved the quality of customer service”) received a relatively high mean score ($M = 3.88$, $SD = 0.847$) indicating a relatively high level of agreement among respondents that digital technologies have improved the quality of customer service within their organizations. This finding suggests that respondents generally perceive digital transformation as having a positive impact on how companies interact with and support their customers. The standard deviation indicates moderate consistency among responses. Although respondents generally agreed with the statement, some variation in perception exists.

The statement G2 (“Your company uses digital channels for effective customer communication”) recorded a mean score of 3.58 and a standard deviation of 1.033. The mean score indicates moderate agreement that companies use digital channels effectively for customer communication. Respondents generally recognize the importance of digital communication platforms in maintaining interaction with customers and facilitating information exchange. However, the standard deviation of is the highest among all variables in

this section, indicating substantial variability in respondents' opinions. This suggests that the effectiveness and extent of digital communication differ significantly between organizations.

The statement G3 ("Your customers report high levels of satisfaction with your digital services") achieved a mean value of 3.41 and a standard deviation of 0.831. The mean score shows moderate agreement that customers are satisfied with the digital services provided by the organizations. This suggests that respondents perceive customer satisfaction with digital services as generally positive, although not exceptionally high. The standard deviation demonstrates moderate consistency among respondents. While many participants agreed that customers are satisfied with digital services, some differences in perception remain.

The statement G4 ("Digitalization has improved response times to customer requests") received a relatively high mean score ($M = 3.81$, $SD = 0.821$). This indicates strong agreement that digitalization has improved organizational response times to customer requests. This finding suggests that respondents perceive digital systems and technologies as effective tools for increasing operational speed and service efficiency. The standard deviation indicates relatively consistent responses among participants. Most respondents appear to share the view that digitalization positively affects service responsiveness.

The statement G5 ("Use of digital customer service tools enhances customer loyalty") achieved a mean score of 3.52 and a standard deviation of 0.742. suggests moderate agreement that the use of digital customer service tools enhances customer loyalty. Respondents generally believe that digital service technologies positively influence customer retention and long-term customer relationships. The standard deviation is relatively low, indicating a strong level of agreement among respondents. Compared with several other variables, this lower variability suggests that respondents consistently perceive digital service tools as beneficial for customer loyalty.

The statement G6 ("Personalized digital experiences improve the perceived value of your company's products/services") recorded a mean value of 3.69 and a standard deviation of 0.728. This indicates a relatively strong level of agreement among respondents that personalized digital experiences enhance the perceived value of their company's products and services. This finding suggests that organizations recognize the importance of personalization in improving customer perceptions and creating more meaningful customer interactions. The standard deviation is relatively low, indicating a high degree of consistency among

respondents. Most participants shared similar opinions regarding the positive impact of personalization on perceived value.

The statement G7 (“Leveraging digital channels has increased customer retention rates”) achieved a mean value of 3.54 and a standard deviation of 0.770. The mean score shows moderate agreement that the use of digital channels contributes to increased customer retention rates. The respondents generally perceive digital communication and engagement platforms as effective tools for maintaining long-term relationships with customers. The standard deviation indicates relatively consistent responses among participants. This suggests that most respondents shared similar perceptions about the role of digital channels in improving customer retention.

The statement G8 (“Improved customer experience has strengthened your company’s competitive position”) recorded a moderately high mean score ($M = 3.61$, $SD = 0.855$), indicating moderate-to-high agreement that improvements in customer experience have strengthened organizational competitive position. This finding suggests that respondents perceive customer experience enhancement as an important source of competitive advantage. The standard deviation of 0.855 indicates moderate variability in responses. While many respondents agreed with the statement, some differences in perception were observed.

The G9 statement (“Your company maintains a market advantage due to its digital capabilities”) showed a mean score of 3.39 and a standard deviation of 0.914. The mean value indicates moderate agreement that organizations maintain a market advantage because of their digital capabilities. Although respondents generally recognize the importance of digital capabilities, the relatively lower mean compared with other variables suggests that organizations may still face challenges in translating digital transformation into sustainable competitive advantage. The standard deviation indicates noticeable variability among responses. This suggests that the respondents differed in their perceptions of whether their organizations have achieved competitive advantage through digitalization.

5.9 Factors analysis

Factor analysis was performed with the help of the SPSS statistical software and its results demonstrate the validity and reliability of the measured items (see Anderson and Gerbing, 1988).

Statistical tool	Description	Selected references
First order factor analysis	It is used to reduce the questionnaire items to a smaller group of items	Buyss and Miller, 2012, p. 109
Second order factor analysis	It is used to identify probable constructs of higher order	Buyss and Miller, 2012, p. 109
Kaiser-Meyer-Olkin (KMO) value	It is used, as a goodness-of-fit measurement, to assess sampling adequacy. It should be $> 0,5$.	Nandagopal et al., 2008, p. 164; Buyss and Miller, 2012, p. 109; Dhillon et al., 2014; Hargreaves and Mani, 2015
Total Variance Explained (TVE)	It is used as a measure of the extent to which a certain factor interprets the variance of its items. Generally, it should be greater than 60.	Nandagopal et al., 2008, p. 164
Factor Loadings	These values are used to determine which variables belong to which factor (i.e., each variable may be assumed as a component of the factor with which it has the highest "loading"). Factor loadings greater than 0,6 are considered as acceptable values.	Nandagopal et al., 2008, p. 164; Chatzoglou et al., 2018
Cronbach's alpha coefficient	It is used to measure the internal consistency / correlation between the study's items. It should ideally be $\geq 0,7$. However, values > 0.60 are also considered as acceptable/good.	Chatzoglou et al., 2018; Tavakol and Dennick, 2011; Buyss and Miller, 2012, p. 109
Correlation analysis	It is used to identify possible -either positive (+) or negative(-)-relationships between the various pairs of variables. For this type of analysis, Spearman's correlation coefficient will be used (± 1 : strong correlation, 0: no correlation), accompanied by its p-value at a certain alpha level.	Nandagopal et al., 2008, p. 164; Darginavičienė and Navickienė, 2015
Analysis of	It is used to assess the probable impact of Part A's items (e.g.,	Lee, 2008

Variance (ANOVA)	demographic data) on the study's factors.	
Structural Equation Modelling (SEM)	It is used to define all the relationships between dependent and independent variables. The goodness-of-fit indices that is used are the following: a) Minimum Sample Discrepancy / Degrees of Freedom (CMIn/DF, acceptable value <5), b) Goodness-of-Fit Index (GFI, acceptable value $>0,9$), c) Comparative Fit Index (CFI, acceptable value $>0,9$), d) Normed Fit Index (NFI, acceptable value $>0,9$), e) Root Mean Square Residual (RMR, unacceptable values $>0,08$), and f) Root Mean Square Error of Approximation (RMSEA, unacceptable values $>0,08$). Moreover, SEM analysis, via IBM SPSS Amos, also gives two important values: a) path coefficient [-1 (strong negative correlation) to 1 (strong positive correlation)], and b) a value at the top right corner of each rectangular -in our case- box, which indicates the percentage of the variance of the certain factor (the one in the box) that is explained by other factors/elements which affect the factor in the box.	Arbuckle, 2007, p. 95; Chatzoglou et al., 2018; Yakubu and Dasuki, 2018; Madan, 2020

Figure 5.9: Statistical tools

Source: Maipas, 2022

The factor analysis results (Table 5.9.b) confirm that the measurement model demonstrates acceptable to excellent reliability and validity across all constructs. Most KMO values exceeded the minimum acceptable threshold of 0.60, indicating adequate sampling adequacy for factor analysis. The Total Variance Explained values for all constructs exceeded 50%, suggesting that the factors adequately represent the observed variables.

	Factors	Items	Mean	Std.D	KMO	TVE	FL	Cronbach a	CR	AVE
DM	Digital Maturity (C1, C2)	2	3,17	,865	,500	80,471	,897 ,897	,756	,892	,805
DT	Digital Transformation (F1, B1, D1-D3)	5	3,50	,769	,845	65,955	,818 ,813 ,824 ,789 ,816	,870	,906	,659
IN	Innovation (F2-F5)	4	3,78	,618	,640	58,494	,769 ,808 ,698 ,781	,758	,849	,585
CE	Customer Experience (G1, G3-G8)	7	3,62	,619	,872	57,207	,687 ,829 ,723 ,753 ,739 ,754 ,801	,874	,903	,572
WF	Workforce (E1, E3-E5)	4	3,53	,574	,703	51,762	,702 ,773 ,725 ,675	,686	,811	,518
CP	Competitive Position (C3-C5, G9)	4	3,40	,808	,845	77,854	,886 ,897 ,905 ,841	,905	,934	,779
OE	Operational Efficiency (B2-B5)	4	3,75	,603	,801	67,244	,862 ,845 ,706 ,857	,831	,891	,672

KMO=Kaiser-Mayer-Olkin index, TVE=Total Variance Explained, FL=Factor Loadings,
CR= Composite Reliability, AVE=Average Variance Extracted

Table 5.9.b: Factor analysis

More specifically, most constructs in the study showed KMO values above 0.70, indicating good sampling adequacy. Customer Experience (0.872) and Competitive Position (0.845) had the highest KMO value and therefore demonstrated excellent adequacy. On the other hand, Digital Maturity had the lowest KMO value (0.500), which is still acceptable but indicates weaker intercorrelations among items.

Furthermore, factor loadings were generally above 0.70, indicating strong relationships between observed variables and their respective constructs. Cronbach's Alpha and Composite

Reliability values largely exceeded recommended thresholds, confirming internal consistency and construct reliability.

To be more exact, loadings above 0.70 are considered strong and loadings between 0.60–0.70 are acceptable in research. Based on the results in table 5.9.b. most factor loadings exceeded 0.70, indicating strong item contributions. Only a few items (e.g., 0.675, 0.687, and 0.698) were slightly below 0.70 but they are still acceptable.

As far as Cronbach's Alpha is concerned, values above 0.70 indicate acceptable reliability and values below 0.70 are still acceptable. Almost every result is above 0.70, indicating acceptable to excellent reliability. The only result that recorded value lower than 0.70 is Workforce (0.686), which is still acceptable for research.

Regarding Composite Reliability, all constructs exceeded the recommended threshold of 0.70, which shows satisfactory reliability. Competitive Position recorded the highest value (0.934), indicating very strong reliability. Workforce had the lowest value (0.811), which still demonstrates acceptable reliability.

Finally, all AVE values exceeded 0.50, demonstrating satisfactory convergent validity. Digital Maturity recorded the highest AVE (0.805), indicating very strong convergent validity. Workforce had the lowest AVE (0.518), but it remained acceptable.

5.10 Correlation Analysis

Because most variables are hierarchical, we did not use Pearson's r index, but Spearman's r index and Sig. (2-tailed) value.

In general, what we observe in the first table is that all the factors are correlated to a fairly high degree with each other ($r=.447$ to $r=.743$). These results at an initial stage support our proposal to include most of these factors in the proposed research model since, as it results from this analysis, there is some degree of correlation between them and they are not completely independent. Moreover, this is also supported by the existing international bibliography.

	Factors	DM	DT	IN	CE	WF	CP
DM	Digital Maturity (C1, C2)	1					
DT	Digital Transformation (F1, B1, D1-D3)	,743** ,000	1				
IN	Innovation (F2-F5)	,472** ,000	,648** ,000	1			
CE	Customer Experience (G1, G3-G8)	,438** ,000	,468** ,000	,470** ,000	1		
WF	Workforce (E1, E3-E5)	,712** ,000	,713** ,000	,653** ,000	,448** ,022	1	
CP	Competitive Position (C3-C5, G9)	,447** ,000	,601** ,000	,498** ,000	,449** ,000	,587** ,000	
OE	Operational Efficiency (B2-B5)	488** ,000	,602** ,000	,654** ,000	,547** ,000	,728** ,000	,596** ,000

** . Correlation is significant at the ,01 level (2-tailed)

* . Correlation is significant at the ,05 level (2-tailed)

Table 5.10.a: Correlation Analysis (Between Factors)

	Variables	A1	A2	A3	A4	A6	A7	A8	A9
A1	Gender	1							
A2	Age	,324 ,000	1						
A3	Highest level of education completed	,037 ,666	-,042 ,631	1					
A4	Place of residence: (Municipality)	,013 ,885	-,008 ,926	-,121 ,163	1				
A6	Employment status	-,214 ,013	-,301 ,000	-,108 ,212	,088 ,310				
A7	Position in the company	-,141 ,103	-,487 ,000	,101 ,242	-,055 ,530	,363 ,000			
A8	Prior experience (in the company)	,193 ,025	,744 ,000	-,042 ,629	-,047 ,589	-,289 ,001	-,383 ,000		
A9	Company type	,311 ,000	,576 ,000	-,019 ,827	-,019 ,826	-,295 ,001	-,308 ,000	,601 ,000	
A10	Company size	,136 ,115	,305 ,000	,037 ,674	-,134 ,122	-,153 ,077	-,121 ,164	,265 ,002	,478 ,000

** . Correlation is significant at the ,01 level (2-tailed)

* . Correlation is significant at the ,05 level (2-tailed)

All the Other non-significant

Table 5.10.b: Correlation Analysis (Between Demographic Characteristics)

In the table 5.10.b, we see that the demographic characteristics also have some degree of correlation with each other, with the exception of the level of education (A3) and the place of residence (A4). Also, the gender of the respondents (A1) is correlated with only a few characteristics, as is the size of the businesses (A10).

	Variables	DM	DT	IN	CE	WF	CP	OE
A1	Gender	-,021 ,807	,043 ,621	,078 ,370	,001 ,993	-,013 ,878	-,018 ,837	,036 ,680
A2	Age	,153 ,076	,098 ,257	-,061 ,479	,081 ,353	-,005 ,950	,015 ,860	-,062 ,475
A3	Highest level of education completed	-,110 ,205	-,002 ,982	,076 ,378	-,003 ,971	,054 ,532	,048 ,577	,039 ,657
A4	Place of residence (Municipality)	,040 ,647	,064 ,460	-,002 ,979	-,066 ,446	,068 ,435	-,044 ,612	,014 ,868
A6	Employment status	-,025 ,774	-,117 ,176	-,052 ,550	-,102 ,241	,017 ,846	,007 ,933	-,075 ,387
A7	Position in the company	-,102 ,239	,004 ,963	,110 ,205	-,116 ,180	-,022 ,799	-,036 ,676	,040 ,647
A8	Prior experience (in the company)	,048 ,583	,039 ,657	-,059 ,495	-,009 ,918	,009 ,913	,005 ,950	-,045 ,604
A9	Company type	-,130 ,134	-,197 ,022	-,149 ,084	-,110 ,204	-,270 ,002	-,237 ,006	-,266 ,002
A10	Company size	-,019 ,830	-,020 ,821	-,001 ,992	,034 ,691	-,106 ,222	,069 ,424	-,074 ,394

****.** Correlation is significant at the ,01 level (2-tailed)

***** Correlation is significant at the ,05 level (2-tailed)

All the Other non-significant

Table 5.10.c: Correlation Analysis (Between Demographic Characteristics and Factors)

Finally, the table 5.10.c shows that of all the demographic characteristics (A1-A10) only the type of business (A9) has a small correlation with four of the seven factors of the model (B, C, D and G).

5.11 ANOVA analysis

The Analysis of Variance (ANOVA) was conducted to determine whether statistically significant differences exist between demographic groups regarding the main study constructs: Digital Maturity (DM), Digital Transformation (DT), Innovation (IN), Customer Experience (CE), Workforce (WF), Competitive Position (CP) and Operational Efficiency (OE).

In general, the respondents' answers to the various questions in the questionnaire do not differ according to the demographic characteristics of the respondents. In detail, only the type of company they work for seems to differentiate the value of two factors (Customer Experience and Competitive Position), as does the level of education for two others (Competitive Position, Organizational Efficiency).

As we can see in table 5.1, respondents holding university-level education (UNI) reported the highest perception of competitive position (Mean = 3.7). This suggests that individuals with higher educational attainment may better recognize how digital capabilities contribute to organizational competitiveness and market advantage. Conversely, respondents with lower educational qualifications reported comparatively lower perceptions of competitive positioning. This finding may indicate that higher educational backgrounds are associated with greater awareness of strategic organizational capabilities and digital competitiveness. These results suggest that educational attainment influences perceptions of organizational competitive position, with university-educated respondents demonstrating stronger recognition of competitive advantages.

Regarding Organizational Efficiency, respondents with university education (UNI) reported the highest mean score (4.0), suggesting stronger perceptions regarding the effectiveness and efficiency of organizational operations. This result may indicate that higher educational attainment is associated with stronger perceptions of operational efficiency within organizations.

Finally, the place of residence seems to differentiate one factor (Workforce). Respondents from Crete reported the highest workforce-related perceptions (Mean = 3.9), followed by Central Greece (Mean = 3.8). In contrast, Thessaloniki reported the lowest mean score (3.1). This result

essentially indicates that it is not necessary to incorporate any of these variables related to demographic characteristics into the model.

	Variables	DM	DT	IN	CE	WF	CP	OE
A1	Gender							
A2	Age							
A3	Highest level of education completed						SE=3,3 PSE=3,2 UNI=3,7 MD=3,3 ,041	SE=3,7 PSE=3,6 UNI=4,0 MD=3,6 ,011
A4	Place of residence (Municipality)					ATT=3,6 SKG=3,1 CR=3,9 CG=3,8 NG=3,3 OTHER=3,5		
A6	Employment status							
A7	Position in the company							
A8	Prior experience (in the company)							
A9	Company type				PC=3,8 NGO=3,3 PS=3,5 ,004		PC=3,7 NGO=2,8 PS=3,2 ,003	
A10	Company size							

Table 5.11: ANOVA (Between Demographic Characteristics and Factors)

5.12 Structural analysis

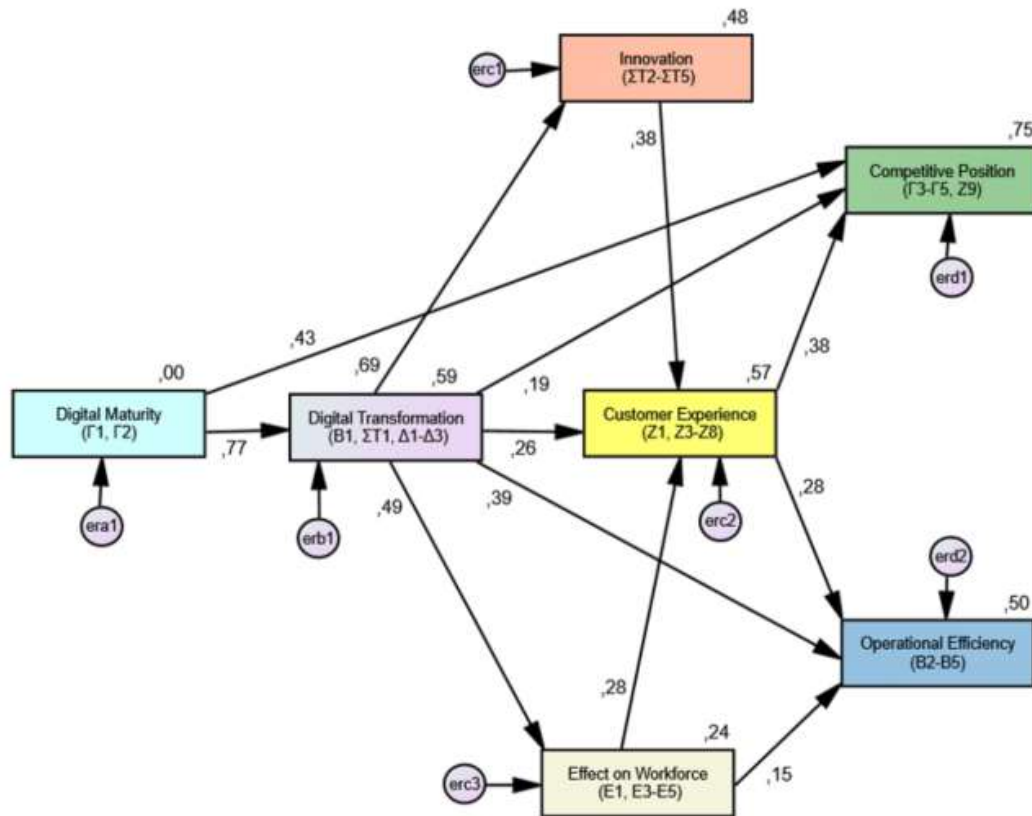


Figure 5.12: The Proposed Research Model

As we observe in the previous model, all six initial hypotheses are accepted. Also, the relationships that we did not initially have in the hypotheses and that concern the relationships between the independent factors of the model (Digital Maturity → Digital Transformation, Innovation → Customer Experience, Workforce → Customer Experience, Customer Experience → Operational Efficiency) emerge.

The strongest relationship in the model was identified between Digital Maturity and Digital Transformation ($\beta = 0.77$). This indicates that organizations with higher levels of digital maturity are significantly more likely to achieve successful digital transformation. Digital Maturity also exerted a strong positive effect on Innovation ($\beta = 0.69$). This relationship

indicates that digitally mature organizations are more capable of developing innovative products, services and processes.

The model in figure 5.12 also shows a moderate positive direct effect of Digital Maturity on Competitive Position ($\beta = 0.43$). This implies that organizations with stronger digital capabilities are more likely to achieve competitive advantages within their industries.

Furthermore, Digital Transformation demonstrated a positive effect on Customer Experience ($\beta = 0.26$). This finding suggests that organizations implementing digital transformation initiatives improve customer interactions, service quality, and customer engagement.

A relatively strong positive relationship was identified between Digital Transformation and Workforce performance ($\beta = 0.49$). This suggests that digital transformation significantly influences employee adaptability, workforce effectiveness, and organizational capabilities.

Digital Transformation also positively influenced Operational Efficiency ($\beta = 0.39$). This indicates that digital transformation initiatives improve organizational processes, reduce inefficiencies, and increase operational effectiveness.

Innovation demonstrated a moderate positive effect on Customer Experience ($\beta = 0.38$). This suggests that organizations that develop innovative solutions are more capable of improving customer satisfaction and delivering better customer experiences

Customer Experience positively influenced Competitive Position ($\beta = 0.38$). This indicates that organizations providing superior customer experiences are more likely to achieve stronger market competitiveness.

The model also demonstrates a positive relationship between Customer Experience and Operational Efficiency ($\beta = 0.28$). This suggests that organizations focused on customer-centered processes may also improve operational performance.

Workforce capability positively influenced Customer Experience ($\beta = 0.28$). This finding suggests that employee skills, adaptability, and performance contribute significantly to customer satisfaction and service quality.

A smaller but positive relationship was identified between Workforce and Operational Efficiency ($\beta = 0.15$). Although weaker than other paths, the finding still suggests that workforce capability contributes to operational improvement.

The model has a high predictive ability for both Operational Efficiency ($R=.50$ or 50%), and mainly for Competitive Position ($R=.75$ or 75%).

	Cmin/DF	CFI	GFI	NFI	RMR	RMSEA
Accepted Scores	< 5	> ,900	> ,900	> ,900	< ,070	< ,100
Actual Scores	2,715	,976	,957	,964	,020	,093

Table 5.12.a: Model Fit indices

As from the results of the table 5.12.a, this model is both valid and reliable as all Good-Fit Indices are within acceptable limits (with the exception of the last RMSEA index).

The obtained value of 2.715 falls well below the maximum acceptable threshold of 5, indicating a good model fit. The CFI value of 0.976 demonstrates excellent model fit and indicates that the proposed model substantially improves the explanation of the observed data compared with the null model.

		Digital Maturity	Digital Transformation	Workforce	Innovation	Customer Experience
Digital Transformation (F1, B1, D1-D3)	D I T	,770 ,000 ,770	,000 ,000 ,000	,000 ,000 ,000	,000 ,000 ,000	,000 ,000 ,000
Workforce (E1, E3-E5)	D I T	,000 ,374 ,374	,486 ,000 ,486	,000 ,000 ,000	,000 ,000 ,000	,000 ,000 ,000
Innovation (F2-F5)	D I T	,000 ,532 ,532	,692 ,000 ,692	,000 ,000 ,000	,000 ,000 ,000	,000 ,000 ,000
Customer Experience (G1, G3-G8)	D I T	,000 ,508 ,508	,263 ,397 ,660	,278 ,000 ,278	,378 ,000 ,378	,000 ,000 ,000
Operational Efficiency (B2-B5)	D I T	,000 ,499 ,499	,392 ,256 ,648	,152 ,077 ,229	,000 ,104 ,104	,276 ,000 ,276

		Digital Maturity	Digital Transformation	Workforce	Innovation	Customer Experience
Competitive Position (C3-C5, G9)	D	,426	,192	,000	,000	,382
	I	,342	,252	,106	,144	,000
	T	,768	,444	,106	,144	,382

D=Direct Effect, I=Indirect Effect, T=Total Effect

Table 5.12.b: Standardized Direct, Indirect and Total Effects

The table 5.12.b presents the overall, direct and indirect effects between the factors of the model. Among other things, we observe that while the Digital Maturity factor does not have a direct relationship with the Operational Efficiency factor, it has a strong indirect relationship ($\beta=.499$).

In the following table (Table 5.12.c) we can see the final results of the research in relation to the research hypotheses described in Chapter 3:

Hypotheses	Results
H1: The adoption of digital transformation practices is positively associated with the improvement of a firm's operational efficiency	<i>Accepted</i>
H2: The level of digital maturity of a firm positively influences its competitive position in the market	<i>Accepted</i>
H3: The strategic alignment between digital transformation and business strategy enhances long-term organizational performance.	<i>Accepted</i>
H4: Digital transformation positively affects employees' skills, performance, and engagement.	<i>Accepted</i>
H5: Investments in digital technologies positively contribute to product and service innovation.	<i>Accepted</i>
H6: The implementation of digital transformation improves customer experience, which in turn enhances business competitiveness	<i>Accepted</i>

Table 5.12.c: Hypotheses and results

6. Discussion and Interpretation of the results

6.1 Discussion

In this thesis, the importance of digital transformation, digital technologies and business competitiveness have been highlighted through the systematic literature review chapter, as well as through the research that has been completed.

According to the literature review, it is widely accepted that “*that digital transformation has become a necessity to maintain competitive advantages of businesses, and not a matter of their free choice*” (Agustian et al., 2023). Also, Hasan et al. proved that implementing digital technologies extends the long-term productivity and resilience of firms.

Based on the research of the current thesis, our results reinforce conclusions from earlier studies that support that investments in digital technologies positively contribute to product and service innovation (Hypothesis 5). Llopis-Albert et al. supported that investments in adapting to digital transformation are vital, since they contribute to increased profits, productivity and competitiveness of firms. Additionally, Leão and da Silva have noted that *digital transformation affects companies’ competitiveness mainly through innovation, modernization, efficiency, management*. The results of our research confirm the previous statements, since the participants’ answers showed a high level of agreement and a low standard deviation.

Our findings also align with recent literatures emphasizing that digital transformation positively affects employees’ skills, performance, and engagement (Hypothesis 4). The recent literatures support that digital technologies increase efficiency, flexibility and productivity and they also improve the decision-making process and create new possibilities and pave the way for advancement (Opoku et al., 2024 and Zhang et. al., 2024). Our research’s results have found that digital transformation initiatives implemented in your company have indeed improved employee productivity.

Furthermore, Burinskiene and Daskevicius and Fan et al. found that digital technologies enhance competitiveness. The research conducted in this thesis has in fact confirmed the results of previous studies. More specifically, it has confirmed that the implementation of digital

transformation improves customer experience, which in turn enhances business competitiveness (Hypothesis 6), as well as the level of digital maturity of a firm positively influences its competitive position in the market (Hypothesis 2). Even though, a few answers of the participants for the statements of Hypotheses 2 and 6 did not receive the highest mean score and had a relatively high standard deviation, the overall outcome aligned with the existing literature review.

Lastly, according to Cavalcante et al. (2025), operational efficiency is one of the highest-rated objectives for organizations undergoing digital transformation. In the same paper, they supported that when digital readiness and the development of new business models are aligned with organizational strategy, they reinforce competitive positioning and long-term sustainability. The findings of this dissertation's research aligned with the previous research studies. More precisely, the current thesis did confirm through the research conducted that The adoption of digital transformation practices is positively associated with the improvement of a firm's operational efficiency (Hypothesis 1) and that the strategic alignment between digital transformation and business strategy enhances long-term organizational performance (Hypothesis 3).

6.2 Limitations

The present study was conducted as part of a postgraduate thesis, which imposed a strict time constraint on its completion. This limitation prevented us from conducting a more in-depth search for additional insights and data. Also, due to the lack of time we couldn't focus solely on a particular occupational position nor on a specific type of company. There also wasn't a possibility to concentrate exclusively on a particular company size, nor on a specific industry sector. Moreover, if we had more time available, we would increase the number of questions (the questionnaire of the study included 45 question), as well as the number of participants, although the 135 respondents constituted a relatively large sample.

6.3 Need for further research

This dissertation's research has created knowledge gaps that could be covered by future research.

The future studies could focus on one specific sector, on solely one occupational position one type of company in order for the researches to be more precise and thorough. Also, the number of questions and the number of participants should be much larger than the one of the current dissertation's research.

Furthermore, the present study is limited to a quantitative approach and does not explore qualitative factors that might affect digitalization processes. Factors such as managerial perspectives, organizational resistance to change and leadership involvement, were not examined during the analysis, although they may play a crucial role in determining the success of digitalization efforts.

That's the reason why, future studies should adopt a qualitative approach by examining the organizational, human, and cultural factors that influence the successful adoption of digital technologies, in order to give more insightful results. Investigating managerial attitudes, employee readiness and leadership practices would enhance the explanatory capacity of digital maturity models and help interpret cases in which digital investments don't result in the anticipated performance improvements.

7. Summary & Conclusions

7.1 Brief Summary

Digital technologies and advancements, as already mentioned, are crucial elements for businesses since they help enhance competitiveness, innovation and improve customer experience. In the second chapter, a systematic literature review was conducted.

The findings of the systematic literature review were used in order to create the research model of the study and the research hypotheses. Based on the research hypotheses and the literature review, a structured questionnaire was formed. As mentioned in chapter 4, the questionnaire of the current thesis was divided into seven sections and consisted of 45 questions. The questionnaire was completed by 135 employed participants. After the data selection, a statistical analysis was conducted by using IBM SPSS.

After the initial data analysis, factor analysis was conducted, as well as correlation analysis and analysis of variance (ANOVA). Subsequently, Structural Equation Modelling (SEM) was conducted to assess the proposed research model and examine the study hypotheses. The results were interpreted and discussed in relation to the research objectives and existing literature. The limitations of the research were then acknowledged, followed by recommendations for future studies.

7.2 Conclusions

Nowadays, digital transformation is an important tool for businesses. The literature underscores the importance of digital technologies that act as an asset, by increasing the competitive advantage, the operational efficiency and enhancing the innovations and the customer experience of the firms.

According to the findings of the present study, most of the respondents' companies have integrated digital technologies into core operation processes. Also, the research has found that

implementing digital transformation has increased the operational efficiency of the companies, by decreasing the required time to complete processes and by reducing operational errors.

Moreover, the results show that digital transformation has improved employee productivity, communication and collaboration among employees. Additionally, the research supports that employees with higher digital literacy contribute more effectively to achieving strategic business goals.

Furthermore, based on the present study's findings, digital technologies have improved the quality of customer service, by reducing response times to customer requests. Also, it is supported that the digital capabilities of the companies strengthen their market position and that aligning strategy and technology contributes to sustainable business growth.

The results of this thesis overall aligned with the existing literature review, since it also confirmed that technology in general facilitates the creation of innovative solutions and has led to the development of new products and services.

To conclude, this current dissertation provides significant insights regarding the impact of digital transformation on the modern companies. As digital transformation continues to evolve, additional research is needed to enhance the understanding of its complexities.

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Appendix A: Questionnaire in English

Digital Transformation as a Strategic Tool for Business Competitiveness

The questionnaire you are invited to answer is part of the research for the preparation of my postgraduate thesis in the Postgraduate Studies Program “Master in Business Administration (MBA)” of the Hellenic Open University.

The purpose of the research is to study the impact that digital transformation has on businesses by examining the way it contributes to their growth and competitiveness.

This questionnaire is the research tool for collecting data that will be used to draw general conclusions within the context of the ongoing study.

The questionnaire is anonymous and the information you provide is confidential.

The questionnaire should only be completed by employees.

Please rate each statement in terms of its current application in your company.

Duration: 10-15 minutes

Thank you very much for your time and valuable contribution.

General questions about the participant

1. Gender

Options:

- a. Man
- b. Woman
- c. Other

2. Age

Options:

- a. 18–24
- b. 25–34
- c. 35–44
- d. 45–54
- e. 55–64

3. Highest level of education completed

Options:

- a. Secondary education
- b. Post-secondary education (e.g., vocational training institute)
- c. University/Technological Institute
- d. Master's degree
- e. PhD
- f. Other

4. Place of residence: Municipality:

5. Place of work: Municipality:

6. What is your employment status in the company/organization you work for?

Options:

- a. Full-time
- b. Part-time
- c. Occasional
- d. Other

7. What is your position in the company/organization you work for?

Options:

- a. Managerial position

- b. Administrative staff
- c. Operational/technical staff
- d. Other

8. How many years have you been working at the company?

Options:

- a. <2
- b. 2-5
- c. 6-10
- d. 11-20
- e. >20

9. What type of company/organization do you work for?

Options:

- a. Private company
- b. Non-governmental organization (NGO)
- c. Public sector
- d. Other

10. What is the size of the company/organization you work for?

Options:

- a. <10 employees
- b. 10–50
- c. 51–250
- d. 251–500
- e. >500

11. What sector does the company/organization you work for operate in?

Options:

- a. Education
- b. Hospitality (e.g., tourism/accommodation, food services)
- c. Financial services
- d. Information Technology & Telecommunications
- e. Healthcare
- f. Media & entertainment
- g. Transportation
- h. Manufacturing/industrial sector
- i. Construction sector
- j. Other

Part B: Operational Efficiency

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

(1: Strongly disagree, 2: Disagree, 3: Neither disagree nor agree, 4: Agree, 5: Strongly agree)

Questions:

- 1. Your company has integrated digital technologies into core operational processes.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

2. Digital technologies have reduced the time required to complete processes.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

3. The use of digital systems has improved your company's productivity.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

4. Digitalization has contributed to a reduction in operational errors.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

5. Implementing Digital Transformation has increased overall operational efficiency.

Options:

- a. Strongly disagree

- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

Part C: Competitiveness

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

Questions:

- 1. Your company has a clear digital transformation strategy.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

- 2. The level of digital maturity in your company is higher than that of your competitors.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree

e. Strongly agree

3. The digital capabilities of your company strengthen your market position.

Options:

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

4. The technological advantage of your company provides a competitive edge.

Options:

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

5. Digital transformation has improved your company's competitiveness.

Options:

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

Part D: Organizational Performance

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

Questions:

- 1. Digital transformation is fully aligned with your company's overall business strategy.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

- 2. Digital investments support long-term organizational goals.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

- 3. Management integrates digital transformation into strategic decision-making.**

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

4. Strategic use of technology has improved the financial performance your company.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

5. Aligning strategy and technology contributes to sustainable business growth.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

Part E: Workforce

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

Questions:

1. Digital transformation initiatives implemented in your company have improved employee productivity.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree

- d. Agree
- e. Strongly agree

2. Training and development in digital skills increases employee engagement and satisfaction.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

3. Adoption of digital tools has enhanced communication and collaboration among employees.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

4. Employees with higher digital literacy contribute more effectively to achieving strategic business goals.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree

e. Strongly agree

5. Digital workflows in your company have reduced employee turnover.

Options:

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

Part F: Digital Investments

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

Questions:

1. Your company systematically invests in new digital technologies.

Options:

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

2. Digital technologies have led to the development of new products or services.

Options:

a. Strongly disagree

- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

3. Technology facilitates the creation of innovative solutions.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

4. The use of data analytics contributes to innovation.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

5. Digital investments have enhanced your company's ability to innovate.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree

- e. Strongly agree

Part G: Customer Experience

Please indicate on a scale of 1 to 5 how much you agree or disagree with the following:

Questions:

1. Digital technologies have improved the quality of customer service.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

2. Your company uses digital channels for effective customer communication.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

3. Your customers report high levels of satisfaction with our digital services.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree

- d. Agree
- e. Strongly agree

4. Digitalization has improved response times to customer requests.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

5. Use of digital customer service tools enhances customer loyalty.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

6. Personalized digital experiences improve the perceived value of your company's products/services.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

7. Leveraging digital channels has increased customer retention rates.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

8. Improved customer experience has strengthened your company's competitive position.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

9. Your company maintains a market advantage due to its digital capabilities.

Options:

- a. Strongly disagree
- b. Disagree
- c. Neither disagree nor agree
- d. Agree
- e. Strongly agree

Thank you very much for your time!

Appendix B: Questionnaire in Greek (Ερωτηματολόγιο)

Ο ψηφιακός μετασχηματισμός ως στρατηγικό εργαλείο για την ανταγωνιστικότητα των επιχειρήσεων

Το ερωτηματολόγιο που καλείστε να απαντήσετε αποτελεί μέρος της έρευνας για την προετοιμασία της μεταπτυχιακής εργασίας μου στο Πρόγραμμα Μεταπτυχιακών Σπουδών “Master in Business Administration (MBA)” του Ελληνικού Ανοικτού Πανεπιστημίου.

Σκοπός της έρευνας είναι να μελετήσει τον αντίκτυπο που έχει ο ψηφιακός μετασχηματισμός στις επιχειρήσεις εξετάζοντας τον τρόπο που συμβάλλει στην ανάπτυξη και την ανταγωνιστικότητά τους.

Το ερωτηματολόγιο αυτό αποτελεί το ερευνητικό μέσο συλλογής των δεδομένων που θα αξιοποιηθούν για τη διεξαγωγή γενικών συμπερασμάτων στο πλαίσιο της υπό εξέλιξη μελέτης.

Το ερωτηματολόγιο είναι ανώνυμο και οι πληροφορίες που παρέχετε είναι εμπιστευτικές.

Το ερωτηματολόγιο πρέπει να συμπληρωθεί μόνο από εργαζόμενους.

Παρακαλώ να αξιολογήσετε κάθε δήλωση ως προς την τρέχουσα εφαρμογή της στην εταιρεία σας.

Διάρκεια: 10-15 λεπτά

Σας ευχαριστώ πολύ για τον χρόνο σας και την πολύτιμη συνεισφορά σας.

Γενικές ερωτήσεις σχετικά με τον συμμετέχοντα

1. Φύλο

Επιλογές:

- α. Άντρας,
- β. Γυναίκα,
- γ. Άλλο

2. Ηλικία

Επιλογές:

- α. 18-24,
- β. 25-34,
- γ. 35-44,

δ. 45-54,

ε. 55-64

3. Υψηλότερο ολοκληρωμένο επίπεδο εκπαίδευσης

Επιλογές:

α. Δευτεροβάθμια εκπαίδευση,

β. Μετα-δευτεροβάθμια εκπαίδευση (π.χ. ΙΕΚ),

γ. ΑΕΙ/ΤΕΙ,

δ. Μεταπτυχιακές Σπουδές,

ε. Διδακτορικό,

στ. Άλλο

4. Τόπος Διαμονής (Δημοτική ενότητα):

5. Τόπος Εργασίας (Δημοτική ενότητα):

6. Ποια είναι η σχέση εργασίας σας με την επιχείρηση στην οποία εργάζεστε;

Επιλογές:

α. Πλήρους Απασχόλησης,

β. Μερικής Απασχόλησης,

γ. Περιστασιακά,

δ. Άλλο

7. Ποια είναι η θέση σας στην επιχείρηση στην οποία εργάζεστε;

Επιλογές:

α. Διευθυντικό Στέλεχος,

β. Διοικητικό Προσωπικό,

γ. Εργατικό Προσωπικό,

δ. Άλλο

8. Πόσα χρόνια εργάζεστε στην εταιρεία;

Επιλογές:

- α. <2
- β. 2-5
- γ. 6-10
- δ. 11-20
- ε. >20

9. Ποιο το είδος της επιχείρησης στην οποία εργάζεστε;

Επιλογές:

- α. Ιδιωτική Επιχείρηση,
- β. Μη Κυβερνητικός Οργανισμός,
- γ. Δημόσιο,
- δ. Άλλο

10. Ποιο είναι το μέγεθος της επιχείρησης στην οποία εργάζεστε;

Επιλογές:

- α. <10 Εργαζόμενοι,
- β. 10-50.
- γ. 51-250,
- δ. 251-500.
- ε. >500

11. Ποιος είναι ο κλάδος στον οποίο δραστηριοποιείται η επιχείρηση στην οποία εργάζεστε;

Επιλογές:

- α. Εκπαίδευση,
- β. Φιλοξενία (π.χ. τουριστικά καταλύματα, εστίαση),
- γ. Χρηματοοικονομικός,
- δ. Πληροφορική και Τηλεπικοινωνίες,
- ε. Υγεία,
- στ. Μέσα ενημέρωσης και ψυχαγωγίας,
- ζ. Μεταφορές,

η. Βιομηχανικός / Βιοτεχνικός κλάδος,

θ. Κατασκευαστικός κλάδος,

ι. Άλλος

Μέρος Β: Λειτουργική αποδοτικότητα

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

(1: Διαφωνώ απόλυτα, 2: Διαφωνώ, 3: Ούτε διαφωνώ ούτε συμφωνώ, 4: Συμφωνώ, 5: Συμφωνώ απόλυτα)

Ερωτήσεις:

- 1. Η εταιρεία σας έχει ενσωματώσει ψηφιακές τεχνολογίες στις βασικές λειτουργικές διαδικασίες.**

Επιλογές:

α. Διαφωνώ απόλυτα

β. Διαφωνώ

γ. Ούτε διαφωνώ ούτε συμφωνώ

δ. Συμφωνώ

ε. Συμφωνώ απόλυτα

- 2. Οι ψηφιακές τεχνολογίες έχουν μειώσει τον χρόνο που απαιτείται για την ολοκλήρωση των διαδικασιών.**

Επιλογές:

α. Διαφωνώ απόλυτα

β. Διαφωνώ

γ. Ούτε διαφωνώ ούτε συμφωνώ

δ. Συμφωνώ

ε. Συμφωνώ απόλυτα

3. Η χρήση ψηφιακών συστημάτων έχει βελτιώσει την παραγωγικότητα της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Ο ψηφιακός μετασχηματισμός έχει συμβάλει στη μείωση των λειτουργικών λαθών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Η εφαρμογή των ψηφιακών τεχνολογιών έχει αυξήσει τη λειτουργική αποδοτικότητα της εταιρείας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Μέρος Γ: Ανταγωνιστικότητα

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

Ερωτήσεις:

1. Η εταιρεία σας διαθέτει σαφή στρατηγική ψηφιακού μετασχηματισμού.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

2. Το επίπεδο ψηφιακής ωριμότητας στην εταιρεία σας είναι υψηλότερο από εκείνο των ανταγωνιστών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

3. Οι ψηφιακές δυνατότητες της εταιρείας σας ενισχύουν τη θέση της στην αγορά.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Το τεχνολογικό πλεονέκτημα της εταιρείας παρέχει ανταγωνιστικό πλεονέκτημα

Επιλογές:

- α. Διαφωνώ απόλυτα

- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Ο ψηφιακός μετασχηματισμός έχει βελτιώσει την ανταγωνιστικότητα της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Μέρος Δ: Οργανωσιακή Απόδοση

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

Ερωτήσεις:

1. Ο ψηφιακός μετασχηματισμός είναι πλήρως ευθυγραμμισμένος με τη συνολική επιχειρηματική στρατηγική της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

2. Οι ψηφιακές επενδύσεις υποστηρίζουν τους μακροπρόθεσμους οργανωσιακούς στόχους της εταιρείας σας

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

3. Η διοίκηση ενσωματώνει τον ψηφιακό μετασχηματισμό στη στρατηγική λήψη αποφάσεων.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Η στρατηγική χρήση της τεχνολογίας έχει βελτιώσει την οικονομική απόδοση της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Η ευθυγράμμιση στρατηγικής και τεχνολογίας συμβάλλει στη βιώσιμη επιχειρηματική ανάπτυξη.

Επιλογές:

- α. Διαφωνώ απόλυτα

- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Μέρος Ε: Εργατικό Δυναμικό

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

Ερωτήσεις:

- 1. Οι πρωτοβουλίες ψηφιακού μετασχηματισμού που εφαρμόστηκαν στην εταιρεία σας έχουν βελτιώσει την παραγωγικότητα των εργαζομένων.**

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

- 2. Η εκπαίδευση και η ανάπτυξη ψηφιακών δεξιοτήτων αυξάνει την εμπλοκή και την ικανοποίηση των εργαζομένων.**

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

- 3. Η υιοθέτηση ψηφιακών εργαλείων έχει ενισχύσει την επικοινωνία και τη συνεργασία μεταξύ των εργαζομένων.**

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Οι εργαζόμενοι με υψηλότερη ψηφιακή παιδεία συνεισφέρουν πιο αποτελεσματικά στην επίτευξη των επιχειρηματικών στόχων.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Οι ψηφιακές ροές εργασίας στην εταιρεία σας έχουν μειώσει τον ρυθμό αποχώρησης εργαζομένων.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Μέρος ΣΤ: Ψηφιακές Επενδύσεις

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

Ερωτήσεις:

1. Η εταιρεία σας επενδύει συστηματικά σε νέες ψηφιακές τεχνολογίες.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

2. Οι ψηφιακές τεχνολογίες έχουν οδηγήσει στην ανάπτυξη νέων προϊόντων ή υπηρεσιών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

3. Η τεχνολογία διευκολύνει τη δημιουργία καινοτόμων λύσεων.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Η χρήση ανάλυσης δεδομένων συμβάλλει στην καινοτομία.

Επιλογές:

- α. Διαφωνώ απόλυτα

- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Οι ψηφιακές επενδύσεις έχουν ενισχύσει την ικανότητα της εταιρείας σας να καινοτομεί.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Μέρος Ζ: Εμπειρία Πελατών

Παρακαλώ, προσδιορίστε με μία κλίμακα από 1 έως 5 πόσο συμφωνείτε ή διαφωνείτε με τα παρακάτω:

Ερωτήσεις:

1. Οι ψηφιακές τεχνολογίες έχουν βελτιώσει την ποιότητα της εξυπηρέτησης πελατών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

2. Η εταιρεία σας χρησιμοποιεί ψηφιακά κανάλια για αποτελεσματική επικοινωνία με τους πελάτες.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

3. Οι πελάτες σας αναφέρουν υψηλά επίπεδα ικανοποίησης από τις ψηφιακές υπηρεσίες σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

4. Ο ψηφιακός μετασχηματισμός έχει βελτιώσει τους χρόνους απόκρισης στα αιτήματα των πελατών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

5. Η χρήση ψηφιακών εργαλείων εξυπηρέτησης πελατών ενισχύει την αφοσίωση των πελατών.

Επιλογές:

- α. Διαφωνώ απόλυτα

- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

6. Οι εξατομικευμένες ψηφιακές εμπειρίες βελτιώνουν την αντιληπτή αξία των προϊόντων/υπηρεσιών της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

7. Η αξιοποίηση ψηφιακών καναλιών έχει αυξήσει τα ποσοστά διατήρησης των πελατών.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

8. Η βελτιωμένη εμπειρία πελατών έχει ενισχύσει την ανταγωνιστική θέση της εταιρείας σας.

Επιλογές:

- α. Διαφωνώ απόλυτα

- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

9. Η εταιρεία σας διατηρεί πλεονέκτημα στην αγορά λόγω των ψηφιακών της δυνατοτήτων.

Επιλογές:

- α. Διαφωνώ απόλυτα
- β. Διαφωνώ
- γ. Ούτε διαφωνώ ούτε συμφωνώ
- δ. Συμφωνώ
- ε. Συμφωνώ απόλυτα

Σας ευχαριστώ πολύ για τον χρόνο σας!

Author's Statement: I hereby expressly declare that, according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work, does not infringe any intellectual property, personality and personal data rights of third parties, does not contain works/contributions from third parties for which the permission of the authors/beneficiaries is required, is not the product of partial or total plagiarism, and that the sources used are limited to the literature references alone and meet the rules of scientific citations.