

**Arab American University
Faculty of Graduate Studies
Department of Administrative
and Financial Sciences
Ph.D. Program in Strategic
Management**



**The Impact of Enterprise Digitalization on Competitive Advantage
among Small and Medium Enterprises: The Mediating Role of
Innovation**

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202020367

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**This Dissertation Was Submitted in Partial
Fulfilment of the Requirements for the Doctor of
Philosophy (Ph.D.) Degree in Strategic
Management**

Palestine, Jan/2026

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Dissertation Approval




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Declaration

I declare that, except where explicit reference is made to the contribution of others, this dissertation is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

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Dedication

To my heart that walks on earth, my beloved father...

And to the sunshine of my days and the light of my life, my dear mother...

To those who have always been my support and aid, my brothers and sisters...

And to my dear nephews and nieces, and their spouses, a part of my extended family.

To the sister my mother never had... my dear sister-in-law.

To my friends, who were my pillar of strength and the safe haven for my secrets and sorrows.

To everyone who extended a helping hand to me on this academic journey, I am grateful for your kindness.

I place this thesis before you as a humble token of my gratitude and a partial repayment of the debt I owe.

Student Name: Hanan Hasan Abdallah Nazzal

Acknowledgments

In the name of Allah, the Most Gracious, the Most Merciful. All praise and thanks are to Allah, who granted me the strength and perseverance to complete this work.

I extend my deepest and most sincere gratitude to my supervisor, Dr. Mohammed Yaseen Haddoud, for his exceptional support, invaluable guidance, and unwavering encouragement throughout this research. His dedication and expertise made this journey not only possible but also inspiring.

My appreciation also goes to the distinguished members of my thesis committee for their time and feedback.

I would like to express my gratitude to the Arab American University for providing an outstanding academic environment and resources that enabled me to complete this research.

I would also like to acknowledge the Deanship of Graduate Studies for their academic support and resources.

To my colleagues in the program, and to my dear friends and family—your encouragement was essential in this journey. Thank you all.

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Abstract

This study aimed to analyze the effects of Enterprise Digitalization (ED) on Competitive Advantage (CA) among Small and Medium-sized Enterprises (SMEs) in Palestine, and to conduct an in-depth investigation into the mediating role of Innovation. This objective is predetermined by the increased awareness that digital technologies have already become an essential element of business competitiveness, and the mechanisms that underlie their practical use and their efficiency in conditions of limited resources still receive scant attention.

The methodology of this study was quantitative, as the research objectives align with it. In this way, the core variables, which are digital transformation, innovation, and competitive advantage, can be measured on a standard and analyzed with statistical instruments (Smart-PLS).

The unit of analysis is the small- and medium-sized enterprise (SME) based in the West Bank, Palestine. An enterprise is a specialized analytical unit for studying the relationships among digital transformation, innovation, and competitive advantage. The sample comprises all SMEs in the West Bank that embrace digital transformation and view innovation as an essential component of business strategy. To obtain accurate, informative data, key informants were selected from senior and executive managers of each SME.

The study's outcomes show that digital transformation and innovation are essential levers for advancing competitive advantage for SMEs, and that innovation partially mediates the relationship between digitization and competitiveness. Overall, the study observes that digital transformation, as an investment object, cannot be regarded as an operational object but rather as a strategy to facilitate innovation, establish a sustainable competitive advantage, and increase companies' ability to adapt to future processes.

Keywords: Enterprise Digitalization, Competitive Advantage, Innovation, Small and Medium-Sized Enterprises (SMEs), Digital Transformation.

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List of Definitions of Abbreviations

Abbreviations	Title
Valuable, Rare, Inimitable, and Non-substitutable	VRIN
Artificial Intelligence	AI
Average Variance Extracted	AVE
California Consumer Privacy Act	CCPA
Competitive Advantage	CA
Customer Relationship Management	CRM
Data-Driven Decision-Making	DDDM
Dynamic Capabilities Theory	DCT
Enterprise Digitalization	DE
General Data Protection Regulation	GDPR
Industrial Organization	I/O
Industrial Revolution	IR
International Labour Organization	ILO
Internet of Things	IoT
Partial Least Squares Structural Equation Modeling	PLS-SEM
Resource-Based View	RBV
Small and Medium Enterprises	SMEs
Social Exchange Theory	SET
Standard Deviation	SD
Variance Inflation Factor	VIF

Chapter One: Introduction

1.1 Background

The twenty-first century is deeply marked by rapid technological advancement and global change. Here, Enterprise Digitalization (DE) has emerged as a crucial factor in determining the likelihood of success for Small and Medium Enterprises (SMEs) in the contemporary business world (Kraus et al., 2018). DE is no longer a far-fetched idea; it is one of the primary areas of interest for ambitious young people and innovators seeking tangible success in the digital business field (Sussan & Acs, 2017). The readiness of SMEs to return to normal after the COVID-19 pandemic and to recover directly depends on their competitiveness and the stability of the country's economy in general (Wahdiniwaty and Firmansyah, 2023). As an unprecedented event, the COVID-19 pandemic introduced significant uncertainty across the health sector, the economic sphere, and industry, with a considerable impact on SME operators (Saepuloh and Firmansyah, 2022; Wahdiniwaty et al., 2022).

On the other hand, the continued growth of the digital economy, particularly the digitalization of businesses during the Industrial Revolution (IR), suggests that SMEs are moving beyond mainstream expectations. The alteration is reflected in the massive increase in the use and development of the Internet of Things (IoT), which has fundamentally changed many aspects of human life, especially the economy (Firmansyah et al., 2022). Online technologies play a significant role in helping SMEs increase their market reach almost immediately, without the need for physical contact with consumers (Firmansyah and Saepuloh, 2022). Such a scenario presents an excellent opportunity for SMEs to enhance their status. To become advanced, independent, and competitive members of the national economy, SMEs need to shift from traditional to digital operating models (Chollisni et al., 2022). Enterprise Digitalization is an extremely topical topic that should be applied across all business sectors worldwide, as it can transform client relations, internal processes, and value creation (Zaoui & Souissi, 2020). To survive, recover, and expand in the rapidly evolving digital and market landscape, SMEs need to adapt and undergo complete transformation (Natalina & Mutafarida, 2023).

Digital literacy is the new set of skills needed for modern business ventures, driven by technological advancements. The advent of the internet has led to the emergence of

digital literacy, focusing on the skills needed to access, search, and critically evaluate information (Liu et al., 2020; Farias-Gaytan et al., 2022; Firmansyah, 2022a). It is important to emphasize, however, that Enterprise Digitalization is not tied to a single technology; rather, it represents a paradigm shift at the intersection of information technology, computing, communication, and connectivity (Cichosz et al., 2020). The extent to which SMEs adopt digital technology is reflected in their technological preparedness and the digitization of their various business processes. This entails their degree of digital consciousness, research abilities, group work, and change aptitudes (Oluwakemi, 2019). Modern business development largely depends on the innovation process, which directly influences the profitability and competitiveness (Markovic et al., 2020). Strategic knowledge development and use are critical for better positioning companies in the global market and enhancing their performance amid intense competition.

Therefore, the use of digital technologies may often affect businesses of various sizes and, at times, cross boundaries, by changing products, operating procedures, distribution channels, and supply chains to create sustainable competitive advantages (Brenner, 2018). Enterprise Digitalization is a dynamic, goal-oriented business trend that responds to changes in the operating environment (Firmansyah and Saepuloh, 2022). It is a kind of business and operational innovation aimed at identifying and implementing new structures in the digital economy that are well-suited to its changing nature (Firmansyah et al., 2023).

Innovation here means creating, adopting, and implementing a fundamentally unrestricted innovation that adds value by integrating digital technology. The outcome may take the form of new products, services, processes, or even specialized business models. The use of contemporary digital technologies, including artificial intelligence (AI), cloud computing, mobile solutions, social networks, and business analytics, has many far-reaching implications on how organizations create and capture value (Lanzolla et al., 2020), implement routine and innovative operations (Füller et al., 2022; Rauch et al., 2020), and organize their internal environments (Marsh et al., 2022). The advantages of most digital technologies include their availability on demand from third-party providers, broad and adjustable usage opportunities, and the ability to create new

relationships with customers, suppliers, and other network participants (Lokuge et al., 2019).

Palestinian Small and Medium Enterprises (SMEs) have a competitive advantage influenced by many factors that shape their market position and management strategies. Their targeting of specialized niche markets is one of the major factors. As SMEs serve different segments, they may develop distinct brand names and loyal clienteles, often based on local handicrafts and products (Al-Azzam et al., 2020). It is vital to innovate and use technology to enhance competitiveness. By leveraging emerging technologies for operational efficiency and e-commerce, SMEs can access wider markets and enhance service delivery. More importantly, product innovation, especially the introduction of new or improved products that comply with local and international quality standards, helps these companies to create differentiation in a competitive environment (Nasr et al., 2021).

Nonetheless, Palestinian SMEs face significant challenges, including political and economic instability, which make maintaining the supply chain and expanding into new markets difficult. Moreover, the complexity of regulations poses challenges to the SMEs aiming to compete successfully (Khalil et al., 2022). To conclude, developing a competitive advantage for Palestinian SMEs requires an all-inclusive approach that leverages local advantages, proactively seeks innovation, and prioritizes the development of meaningful customer relationships. By successfully addressing current issues and leveraging available opportunities, SMEs can thrive in the market economy.

In addition to adopting technologies, Palestinian SMEs face specific contextual factors that influence their digitalization process. Lack of mobility, limited digital infrastructure in rural areas, and a lack of venture capital also pose additional barriers due to fragmented market access (World Bank, 2023). Nevertheless, Palestinian businesspersons are incredibly resilient, and they use online technologies to overcome the limitations of physical space and reach international markets. For example, 42% of Palestinian SMEs reported using e-commerce platforms during the COVID-19 lockdowns to remain operational (UNCTAD, 2022). This is a paradoxical, constraint-based innovation that warrants closer examination to understand how digitalization turns adversity into a competitive advantage.

1.2 Problem Statement

Enterprise Digitalization (ED), the overall integration of digital technologies across all organizational operations, is a growing field of research attracting increasing academic interest. This shift in digital technology has fundamentally changed organizational structures, decision-making processes, and consumer interactions, thereby redefining competitive dynamics (Cavallo et al., 2019). However, the concept is still emerging, but ED is already needed to comprehend the impact of digital tools, including data analytics, cloud computing, and Artificial Intelligence (AI), on firm strategy and competitiveness, especially in small and medium-sized enterprises (SMEs).

Information technology advances provide significant benefits to business-oriented entities, which have ceased being a supporting function and have become a source of competitive advantage (Cahyadi and Magda, 2021). Nevertheless, some companies have not been able to maintain a high level of performance because they have been unable to incorporate digital capabilities into their business models successfully and remain open to the challenges posed by competitors who are more digitally savvy (Magnusson et al., 2022; Marino-Romero et al., 2023). For SMEs, the ability to use digital technologies is particularly essential, as digitalization offers opportunities for increased efficiency, market growth, and innovation, allowing them to go beyond structural limitations.

SMEs account for 61% and 81% of total employment in the privately owned sector in the country, which is a key contribution to the country's and the global economy (Mircevska, 2015). They are dynamic, flexible, and adaptable; hence, they are crucial to boosting economic growth and creating employment. It is well known that innovation is a significant competitive resource and a crucial factor in long-term productivity and sustainability. It enables SMEs to create new products, improve services, and distinguish themselves in more digital marketplaces. Modern growth theories suggest that innovation is the process that enables companies to convert digital resources into visible performance results (Kraus et al., 2020; Hossain, 2015; Hossain and Kauranen, 2016).

Past research has investigated innovation in SMEs at the national and international levels and its effects on performance and development (Colombo et al., 2014; Odriozola-Fernandez et al., 2019). Thus, the current research study seeks to answer the following research question: How does Enterprise Digitalization increase Competitive Advantage in SMEs, and what is the mediating role of Innovation in this relationship? Although

many people have viewed digital technologies as capable of promoting innovation and competitiveness, the lack of empirical research, especially in emerging economies, has left it unclear how these constructs are related. The existing literature has not clearly explained the mechanism by which ED leads to innovation, and how that innovation, in turn, leads to a competitive advantage. Therefore, the mediating role of innovation in the relationship between Enterprise Digitalization and Competitive Advantage remains unclear, leaving significant gaps for both academic theory and practical strategy.

The competitive advantage of Small and Medium Enterprises (SMEs) in Palestine is shaped by many factors that affect their market positioning and management approaches. A major factor is that they aim at specialized or niche markets. By appealing to specific segments, SMEs can develop a unique brand identity and a loyal clientele, often by offering local handicrafts and merchandise (Al-Azzam et al., 2020). The most important aspect for enhancing competitiveness is innovation and technology. The availability of emerging technologies in operating efficiency and e-commerce opens broader markets and enhances service delivery to SMEs. Importantly, product innovation, especially new or improved products that comply with local and international quality standards, would enable these firms to differentiate in a competitive environment (Nasr et al., 2021).

Nevertheless, Palestinian SMEs face significant challenges, including political and economic instability, which make maintaining the supply chain and promoting market growth difficult. Moreover, the complexity of regulations poses challenges to SMEs on their way to effective competition (Khalil et al., 2022). To conclude, developing a competitive advantage for Palestinian SMEs requires a complex approach that maximises local advantage, actively encourages innovation, and places strong emphasis on effective customer relations. As existing issues are resolved in a timely manner and maximum opportunities are utilized, SMEs can thrive in the market economy.

1.3 Research Gap

Although it is evident that the transformative power of digitalization is very high, there is an enduring gap in our understanding of how this transformation can be translated into sustainable competitive advantage. In more specific terms, the extent to which innovation mediates between Enterprise Digitalization (ED) and Competitive Advantage

(CA) remains empirically under-researched, especially in developing economies such as Palestine (Awawdeh et al., 2022; Alsafadi and Aljuhmani, 2024; Malkawi et al., 2024). This is the simplistic, linear assumption of the existing literature, namely that the implementation of digital tools inevitably leads to improved performance. This, however, does not account for the key intermediary processes. The scientific aspect of learning about this mediating mechanism is not solely an academic activity; it is a necessity for developing a more in-depth and precise assessment of the ways digital technologies can contribute to innovation-based competitiveness. In the absence of this knowledge, organizations and policymakers tend to invest heavily in digital infrastructure that does not deliver the anticipated strategic payoffs, leading to an implementation gap in which technology is available but not fully utilized.

As a result, the critical value of the current research lies in the systematic study of the mediating role of innovation as the key process by which the implementation of digital instruments is converted into high performance (Bharadwaj et al., 2013; Nambisan, 2017). Although Small and Medium Enterprises (SMEs) in Palestine have to deal with various difficulties in the context of digital transformation a significant lack of clarity is still present when it comes to the way that the particular application of the specific aspects of the ED dimensions can lead to the achievement of the best innovation and competitive output results (Kraus et al., 2021; Li et al., 2020; Vial, 2021). A major weakness of much of the existing research is the tendency to treat digitalization as a single entity. The fact is that the investment in e-business optimization, aimed at improving process efficiency, requires different resource requirements and strategic implications than the investment in AI-based personalized marketing, which focuses on customer intimacy for an SME. The influence of these unequal dimensions on the firm's innovativeness would also vary. The proposed study will help fill this critical knowledge gap by offering detailed, granular empirical data about the particular route of Digitalization → Innovation → Competitive Advantage in the Palestinian context, not relying on generalities but instead providing dimension-specific information.

More importantly, and arguably most importantly, the literature is too dense regarding neglecting the interaction between formalized strategies of digitalization and the informal innovation habits that are widespread and central to Palestinian SMEs. Frameworks of digitalization and innovation are constructed mainly around models

originating in the West, where formal R&D divisions, systematized innovation processes, and institutional reinforcement are the rule. This background is wildly contrasting to that of Palestine. Research suggests that a large percentage of innovation within developing economies, up to 65% of it, is developed through informal sources such as peer-to-peer knowledge sharing, problem-solving in the community, and even adapting existing technologies to fit new uses (Al-Mashaqbeh and Khasawneh, 2023). This “grassroots innovation” is neither indicative of underdevelopment nor uncivilised, but a complex, institutionally tailored reaction to the lack of institutions, resource scarcity, and market unpredictability. It is a tribute to the durability and innovativeness of Palestinian businesses. The intermediary role of such informal, grassroots innovation in translating formal digital tools into physical competitive advantage is barely studied.

This disjuncture is especially acute in Palestine, where informal networks and social capital can offset the absence of formal institutional support but are seldom incorporated into mainstream digitalization models or research approaches. Are these loose, informal practices smothered by the adoption of a formal ERP system? Or can they be enhanced through digital media such as WhatsApp or even social media, forming digital-enabled networks to solve them quickly and innovate? This research hypothesizes that one cannot have a complete and flawless picture of the real effects of digitalization by neglecting its informal aspects. Thus, the proposed research is focused not only on filling the knowledge gap in the area of formal mediation pathway but also pioneering the incorporation of informal innovation dynamics into the model that can present a much more genuine and more sophisticated image of how SMEs in Palestine use all the available resources, including formal and informal ones, to compete and survive in the digital environment.

1.4 Research Questions

To systematically address the identified research gap and accomplish the objectives of this research, a set of four interdependent research questions has been developed. These questions will help structure the intricate connections between Enterprise Digitalization, Innovation, and Competitive Advantage, moving from a general, high-level question to a more specific, process-focused one. They act as a guiding light throughout the research process, ensuring the investigation is focused, coherent, and capable of generating meaningful insights. The following are the research questions that will be used to guide this research:

1. How does Enterprise Digitalization (ED) affect Competitive Advantage (CA) of Small and Medium-sized Enterprises (SMEs) in Palestine?

This underlying question aims at determining the major, immediate relationship between the core independent and dependent variables. It is necessary to ensure that the significant investment in digital technologies among Palestinian SMEs delivers a direct, quantifiable payoff in terms of their competitive position before proceeding to discuss more complex processes. Providing an answer to this question will provide a ground-level understanding of the value of digitalization in this particular case. It addresses the primary question for business owners and managers: “Will we become more competitive as soon as we invest in digital tools?” The answer would confirm digitalization as a strategic necessity, and a negative or weak correlation would indicate that its advantages are more indirect and depend on other attributes, preparing the way for the following questions.

2. What is the impact of individual dimensions of Enterprise Digitalization (in particular, E-Business Optimization, Data-Driven Decision Making, Social Media Engagement, Cloud-Based Collaboration, and Personalized Marketing with AI) On SMEs’ Innovation?

This question goes beyond treating Enterprise Digitalization as a monolithic construct and instead disaggregates it into the five dimensions that comprise it. This is to gain a deeper, granular view of which digital practices are the strongest drivers of innovation. This detail is important for SMEs working with limited resources. It shifts the study from general suggestions about digitalization to more concrete, actionable ones, such as investing more in optimizing e-business and social media activities to drive innovation. “In such a dissection, the study will be able to determine which digital levers are the most successful at changing the process in the organization, creating innovative problem-solving and stimulating the emergence of new products, services, or business models within the Palestinian SME ecosystem.

3. What is the direct effect of Innovation on Competitive Advantage (CA) SMEs’ competitive Advantage?

This question is meant to challenge the second pathway, which is critical in the conceptual model. It is an attempt to empirically confirm the long-standing principle of strategic management theory that innovation is the primary source of competitive

advantage in the context of Palestinian-specific conditions. Although this relationship is well documented in advanced economies, its intensity and how it is expressed in a resource-constrained, volatile environment should be the subject of particular research. This question will test the claim that innovative products, which may result from digitalization, actually lead to the best market performance, customer loyalty, and profitability for Palestinian SMEs. It makes innovation a cornerstone of its own results and a compelling factor of business success.

4. Is Innovation a critical mediating variable between Enterprise Digitalization (ED) And SMEs' CA?

It is the main and most complex question of the study, serving as a synthesis of the previous three questions and as a test of the central thesis. It examines whether the benefits of digitalization are translated into sustainable competitive advantage through the bridging role of Innovation. A high mediating effect would imply that the most resilient and strongest competitive advantages are not acquired solely through the employment of digital tools to become efficient, but through an innovation culture enabled by those tools. The implications of this finding would have been immense: the end product of digital transformation is not digitalization itself, but the development of an innovative organization capable of continually changing and creating new value in the market.

1.5 Study Aim and Objectives

The objectives of the research are to identify the effects of Enterprise Digitalization (ED) on Competitive Advantage (CA) among Small and Medium-sized Enterprises (SMEs) in Palestine, and to conduct an in-depth investigation into the mediating role of Innovation. This objective is predetermined by the increased awareness that digital technologies have already become an essential element of business competitiveness, and the mechanisms that underlie their practical use and their efficiency in conditions of limited resources still receive scant attention.

Accordingly, the specific objectives of the study are:

1. To examine the ~~general~~ direct impact of Enterprise Digitalization (ED) on Competitive Advantage (CA) in Palestine among SMEs.

2. To examine how the five dimensions of Enterprise Digitalization (E-Business Optimization, Data-Driven Decision Making, Social Media Engagement, Cloud-Based Collaboration, and Personalized Marketing with AI) affect Innovation among Palestinian SMEs.
3. To determine the direct impact of Innovation on Competitive Advantage (CA) that SMEs have achieved.
4. To test the ~~relevance~~ of the mediating effect of the variable Innovation concerning the relationship between Enterprise Digitalization (ED) and Competitive Advantage (CA).

1.6 Importance of the study

The study has extensive theoretical, methodological, and practical implications. It is likely to contribute significantly to knowledge of Enterprise Digitalization and competitive forces in the SME sphere, especially in the subtleties of emerging economies. It is not just a necessary addition to the literature; it is an attempt to transform the discourse on how digital transformation can lead to real success for businesses operating under unique conditions.

1.6.1 Theoretical Contribution

Fundamentally, this piece of work explains why Enterprise Digitalization (ED) can transform the competitive environment of Small and Medium-sized Enterprises (SMEs). Although the overall connection between technology and performance is acknowledged, the present research aims to expand theoretical understanding of how digitalization contributes to competitive advantage (CA). The study is a valuable addition to the theoretical framework of the fast-developing area by carefully examining the avenues through which digital adoption can influence performance.

To be more precise, the thesis provides a strong theoretical framework for researching the mediating effect of Innovation between Enterprise Digitalization and Competitive Advantage. This is an essential theoretical sophistication. It extends the discussion beyond a one-dimensional view of digital tools as a direct source of benefit. Instead, it assumes a more advanced and process-based concept Where digitalization initiates the enhancement of innovation, which in turn leads to achieving competitive advantage. This dimension favors extending current research on different aspects of

innovation (product, process, marketing, and organization) and their respective impacts on competitiveness, thereby expanding the boundaries of Enterprise Digitalization and organizational literature.

In addition, this paper is important because it applies and extends the well-known theories of strategic management, namely the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT), in the context of the digital and developing worlds. It views Enterprise Digitalization not as a set of tools alone, but as a set of resources and capabilities. In this perspective, the study examines how specific digital capabilities (e.g., data-driven decision-making, AI-based marketing) can be turned into Valuable, Rare, Inimitable, and Non-substitutable (VRIN) resources, which RBV assumes are the source of sustainable competitive advantage. At the same time, it also positions Innovation as the embodiment of dynamic capability, the organizational procedure that permits SMEs to integrate, develop, and reorganize their digital assets to adjust to and influence fluctuating market conditions. Through empirical associations among these theories, the research has developed a more comprehensive theoretical framework for the digital-era strategy.

Most importantly, the study challenges the generalizability and limits of these Western-centric theories by undertaking such an investigation in the Palestinian context. These models are a stress test due to the unique political, economic, and infrastructural challenges faced in Palestine. The implications of the findings could be the discovery that competitive advantage pathways are varied in these contexts, which may lead to new, context-specific theoretical accommodations and more accurate depictions of the contexts of entrepreneurship in fragile or resource-constrained economies. This paper, by developing these theoretical constructs based on Enterprise Digitalization and Innovation, opens the door for future studies to look beyond the direct effects of digital tools and examine the multi-faceted, non-linear processes that make SMEs competitive.

1.6.2 Theoretical and Methodological Contribution

Scientifically and methodologically, the research is novel in its extensive exploration of the result of Enterprise Digitalization on the manifestation of Competitive Advantage through the prism of Innovation among SMEs. It is hoped that it will play a significant role in enriching the understanding of the role of digitalization in success and

competitiveness in the digital space. The study outlines an explicit, strict scientific approach to elucidating the dynamics of multifactorial causal relationships.

Among the essential methodological advances, the creation and testing of a multi-dimensional Enterprise Digitalization scale may be mentioned. This paper breaks down ED into five different, quantifiable dimensions (E-Business Optimization, Data-Driven Decision Making, Social Media Engagement, Cloud-Based Collaboration, and Personalized Marketing with AI). The fact that this scale is being created, upgraded, and tested is, in itself, a contribution. The instrument may be a sound basis in the future when researchers aim to quantify the process of digitalization in a more detailed and accurate way.

Additionally, the analytical methodology used in the study, Structural Equation Modeling (SEM), to test the complex mediation model, is a methodological improvement over simpler analytical methods. SEM is the only method that can test complex theoretical models with multiple dependent and mediating variables simultaneously. It can estimate both direct and indirect effects and provide a more comprehensive, statistically valid picture of the causal pathways. This study is very high in empirical rigor in the field, establishing a rigorous scientific framework to understand the complex causal relationships between Enterprise Digitalization and Innovation, as well as how Innovation contributes to the enhancement of Competitive Advantage.

1.6.3 Practical Contribution

In addition to its academic value, this study's findings will provide evidence-based recommendations to various stakeholders to help SMEs optimize and localize their competitive strategies during the digital transformation era. The practicality of the research findings is essential for achieving a realistic impact in actual business scenarios. The implications of the research findings will be of the multi-level effect:

- **For SME Owners and Managers:** The results will provide a strategic roadmap. The research will allow entrepreneurs to prioritize their limited investments by identifying which aspects of digitalization are most closely linked to innovation and competitive edge. For example, if it is discovered that data-driven decision-making is the most effective approach, a proprietor may consider pursuing a deeper training in analytics rather than a more superficial social media presence. It takes them

beyond the question of “whether or not to digitalize”. To “How can we digitalize in order to have maximum impact?”

- **For Policymakers and Government Agencies:** The study will offer evidence-based recommendations to stakeholders on digitalization and innovation in SMEs. It can guide specific interventions rather than general policies. If cloud-based collaboration is proven to be a key enabler of innovation, policymakers might focus on enhancing national digital infrastructure or subsidizing cloud services. If a lack of digital skills is found to be a significant obstacle, they can also plan and invest in specialized training programs. It will allow for a more strategic distribution of public resources, contributing to the economy more widely and efficiently.
- **For Academic Institutions and Educators:** The research will foster collaboration between institutions and industry, enabling the sharing of knowledge and expertise in entrepreneurship and innovation activities. The results can have direct implications for curriculum development in business schools and vocational training centers in Palestine and other areas, ensuring that the next generation of business starters is prepared with the digital and innovative skills needed to operate in the modern economy.
- **For International Development Agencies and NGOs:** The study offers a replicable model for enhancing sustainable economic development in emerging and weak states. It shows that advocating the development of the private sector is not only about capital inflows but also about creating digital and innovative infrastructure for local enterprises. The knowledge gained can be used to design more efficient development initiatives to build resilient, competitive SMEs capable of driving long-term prosperity.

Overall, the research aims not only to fill current gaps in the literature on digital strategy and competitive advantage but also to provide a scientific and theoretical platform to guide future studies and practical change in this paramount area. It bridges the gap between high-level theory and on-the-ground practice, offering insights that are academically robust, methodologically sound, and practically indispensable.

Chapter Two: Literature Review

2.1 Introduction

The last chapter addressed the study introduction, problem scope, objectives, and significance, based on the study's variables and their associations. The chapter is the Literature Review; it will explore the influence of enterprise digitalization on competitive advantage in SMEs, with innovation as a mediator. Enterprise digitalization, competitive advantage, and innovation will be the main content areas in this chapter, with innovation as a mediating role. This chapter will filter the available literature and empirical research to illuminate the interconnection between enterprise digitalization, innovation, and competitive advantage. It will then present some of the main findings and identify gaps that may require further investigation in the work already done. Making all this up, the chapter will also attempt to bring the role of enterprise digitalization in SMEs full circle, given the significance of innovation in this context.

2.2 Enterprise Digitalization

Enterprise digitalization is the process of integrating entrepreneurship and recent digital technologies to enable companies to develop, grow, innovate, and build the capacity to create competitive value in the digital era (Ngugi & Karanja, 2019). This change capitalizes on contemporary technological and digital applications and approaches, such as cloud computing, artificial intelligence, and data analytics, to elevate the customer experience, increase customer satisfaction with the services and products offered by businesses, and optimize business processes. (Kraus et al., 2019).

A group or person who develops an entity's interest in creating new and innovative functionalities for existing products and services is identified according to the definition set by their creators. This is where entrepreneurship development can be defined as a method of utilizing new procedures and resources gained in a new market to transform and create new products and services (Tülüce & Yurtkur, 2015). As the conceptual groundwork for innovation and responsiveness to market change is being laid, it crosscuts the thin slice of more specific details into a broader, more systemic process: enterprise digitalization. In contrast to Enterprise Digitalization, enterprise digitalization refers to a system-wide change and is characterized by the introduction of advanced digital

technologies into current business models, operating processes, and decision-making (Andersen et al., 2022; Kraus and Kraus, 2021).

The process of digitalization here will not only be the incorporation of digital tools but also the introduction of digital reasoning and infrastructure into an entire organizational approach. Adoption of enterprise-wide applications like ERP and CRM applications, artificial intelligence to facilitate analytics and prediction, cloud-based teamwork, and integration of big data will each lead to the development of insight-based decision-making. The key way the transformation alters the value-creation, delivery, and capture model is that companies can further optimize operations, improve customer interactions, reduce expenses, and adapt to market changes rapidly (Wang et al., 2023; Aithal, 2023).

Due to the changes involved, digitalization shifts the organization's culture toward promoting lifelong learning, flexibility, and innovation. According to Evans, Garrigós Simón et al. (2021) argue that digital architecture is developed through the digital design of the enterprise, based on a cultural strategy and digital infrastructure. As most of its focus is on digital startups as the competitive point, digitalization, however, alters the rules of competition for old firms by enabling them to create new internal capacities and new external value propositions in the digital economy.

2.2.1 Enterprise Digitalization in Practice

Enterprise digitalization refers to the ambiguous redesign of business models, structures, and operations using sophisticated integration of digital technologies, such as APIs, social networks, and big data analytics, to digitalize processes of online value creation in all areas of functionality (Modgil et al., 2022; Kollmann et al., 2022). Enterprise digitalization is not one initiative; it involves the establishment, management, and expansion of business operations.

Among the primary causes of this change is the rapid pace of technological infrastructure evolution. These enterprises are increasingly digitising their operations to reduce market-entry costs and gain closer proximity to customers or suppliers through their online ecosystems (Palmié et al., 2022). These digital ecosystems scale access to world markets while providing flexibility in organizational formations and even new ways of communicating with stakeholders (Agustian et al., 2023).

The flexibility and constant innovation are only developed through digitalization. The companies have to strive to develop a nimble system that is constantly feedback-driven: live data, customer comments, and digitally interactive systems that allow short-loop cycles in product development and service provision. In this manner, digitalization is not merely technical modernization; it becomes a strategic requirement that revitalizes internal forces and gives organizations a long-term competitive edge (Ahmed et al., 2017).

Enterprise-wide digitalization presupposes an open-to-change strategic culture that is willing to test new theories, and the goal of technology investment should be aligned with the market. Vial (2021) indicates that digital transformation in an organization is not just about using new tools but about establishing processes and mindsets that will drive radical, sustainable value creation. Therefore, digitalization provides organizational renewal, as firms can discover, design, and deliver digitally enabled, customer-centric, and strategically divergent value propositions.

2.2.2 Conceptualization of Enterprise Digitalization

Enterprise Digitalization (ED) is the most comprehensive integration of digital technologies across a company's strategic, operational, and structural dimensions, aimed at driving innovation, enhancing performance, and generating sustainable value. The concept of ED does not imply merely adopting digital tools but requires reorganizing organizational processes and business models in line with current technological trends and market disruptions (Oyeyemi et al., 2024).

Recent debates argue that ED is a critical component for improving economic growth and competitive advantage in the new digital economy. It leverages emerging technologies, including artificial intelligence, cloud computing, and big data analytics, to create new sources of value and to be agile in its strategic delivery approach (Aksoy 2023; Kraus 2023). Strategic implementation of ED aims to reorganize the principles of value creation, thereby changing industry dynamics through intensive innovation and customer-oriented metrics, according to Modgil et al. (2022).

The effects of the ED of practice are quickly manifested in sectors that use technology to enhance digital capacity, improve technology, and adapt to fluctuating consumer demands. The works of Nambisan et al. (2019) and Steininger (2019)

emphasize the role of digital transformation in enabling greater innovation and competition at the national level. This perception of ED is not conceived as an isolated technical change but, on the contrary, labor with new organizational change regarding decision-making, business design, and interaction with stakeholders.

Also, the process of enterprise digitalization is not just about triggering technological changes; it is also a response to evolution. It is developing new tracks on the digital path to building business and ensuring the organization's continuity, matching internal capabilities with external technological developments (Xu et al., 2022; Bazadough, 2024). In that sense, ED is a complex and dynamic construct with a strategic focus and technological implementation that alters outcomes.

2.2.3 The Main Dimensions of Enterprise Digitalization

The foregoing is an excellent illustration of what Saputra et al. (2024), Al Koliby et al. (2024), and Shehadeh et al. (2023) have been targeting, where they explain the use of analytics, cloud infrastructure, and many others as part of social media strategies that directly assist in competitive positioning in the case of SMEs. Although not all studies related to the above-mentioned factors as dimensions of enterprise digitalization, they still identified them as essential enablers or predictors of digital transformation. The current research, therefore, brings together these common constructs and classifies them under labels in a systematic manner to denote their practical application in enterprise digitalization.

The terms ("e-business optimization", "AI-powered personalized marketing") were created by the researcher to enable conceptual grouping and the easy articulation of the key practices around digital transformation revealed through the literature search. Each label represents a broad thematic role across numerous studies and has peer-reviewed support for the specific role, involving performance, innovation, or competitive advantage among digital evolution companies (Li et al., 2022; Garrigós Simón et al., 2021; Ngugi and Karanja, 2019).

According to Sahut et al. (2021), the existence of such tools as social media, open-source software and hardware, crowdsourcing, crowdfunding, online trust and reputation evaluation, 3D printing, digital imaging, and big data is radically lowering the threshold between the innovation process and the birth of new enterprises (Steininger 2019).

Digital tools and platforms tend to produce a new form of work that is hard to categorize unambiguously as self-employment, freelance work, or venture-oriented growth entrepreneurship, which is why we believe ED is the merger of traditional entrepreneurship with the new mechanisms for establishing and sustaining businesses in the digital era.

Elia et al. (2020) have outlined a digital entrepreneurial ecosystem comprising four dimensions: digital actors (who), digital actions (what), digital motives (why), and digital organization (how). According to Beliaeva et al. (2020), the innovation ecosystem plays a significant role in enterprise digitalization.

Enterprise digitalization is not a multidimensional field; rather, it is a practical field, and researchers have developed several rational approaches to quantify its dimensions. Researchers assert, with antagonistic intent, that traditional metrics cannot render due justice to the dynamism of digital business. According to Kraus et al. (2021), the digitalization of enterprises must be evaluated through a comprehensive approach that considers both technological capabilities and strategic practice. Similarly, Vial (2021) emphasizes that one should consider the perception of digital transformation not only in terms of the technology applied, but also in how it is used to shape business strategy and drive innovation.

The scope of any transaction or public service that is digitized and incorporates the majority of operations, procurement, and production, as well as distribution and customer service, is simple to simplify operations and cut transaction costs radically. It can rapidly adapt to market changes. In this case, an e-business solution and digital supply chain management increase market scope and lead to more efficient operations in terms of cost; optimization of day-to-day processes will then be done. Big-data analytics will then deliver large-scale analyses of transactional and operational data, yielding action-packed results that sharpen forecasts, strengthen risk appraisal, and enhance strategic decision-making, thereby enhancing their dynamic capabilities and collective performance. And lastly, with live media participation nowadays, one-way promotion is turned into an active, interactive two-way dialogue, co-creation with the customer, community brand building, and the surfacing of real-time feedback loops that introduce innovation to products and services. In essence, most of this is sustained by an amalgamation of collaborative technologies that cleanses these geographical and infrastructural barriers to

the smooth flow of information. Elastic, scalable Artificial intelligence technology is significantly contributing to the digitalization of businesses through personalized marketing. Personalization entails tailoring events, recommendations, and pricing to each customer based on their data to drive greater engagement and, consequently, higher conversion rates. With AI-based systems, organisations should be able to generate experience customization, enabling them to offer recommendations, customised hyperlinks, and dynamic prices (as discussed with Vdovichena et al., 2024). Moreover, Emma et al. (2024) argued that personalized, data-driven strategies have become absolutely critical in online competition.

In light of the preceding discussion, our study identifies the following dimensions as indicators of enterprise digitalization (1. Improving e-business, 2. Data-driven decision making, 3. Social Media Engagement, 4. Cloud-based collaboration, 5. Personalized Marketing Using AI): (Ngugi & Karanja, 2019; Fattah & Arief, 2023; Saputra et al., 2024; Xu et al, 2020; Al Koliby et al., 2024; Shehadeh et al., 2023; Ngugi & Karanja, 2019).

2.2.3.1 Improving e-business

Optimization of e-business has proved to be a fundamental aspect of enterprise digitalization, especially for small and medium enterprises (SMEs) in their quest to digitalize daily transactions. This aspect is not only about online transactions but also about restructuring business processes into customer-centric, operationally efficient, and strategically agile digital workflows (Baskoro, 2024).

Although this term might not be applicable to all studies, many concepts across a broad range of studies already exhibit similar relations to enhancing e-business. An example is provided by Saputra et al. (2024), who discuss the use of technology to streamline the supply chain and automate operations, thereby enhancing the firm's adaptability. According to Al Koliby et al. (2024), competitive performance is achieved through the use of digital marketing and web-based service platforms, supported by customer-centered policymaking.

Also, Ngugi and Karanja (2019) outline digital entrepreneurial practices, such as multi-channel integration and the automation of online processes, as key determinants of digital transformation in SMEs. They claimed that decision-making and customer experience were being made meaningful by ERP, SEO, and web analytics tools.

Altogether, the discussion promotes the perspective that e-business optimization enables additional digitalization. It is an indication of how the enterprise can re-engineer its processes using digital infrastructure to reduce costs and, at the same time, increase its capacity to respond to and generate more value for all its stakeholders.

2.2.3.2 Data-driven decision making

It also involves data-driven decision-making (DDDM) and using data-driven insights to shape strategies and operations (Gade, 2021). Using big data, entrepreneurs can help measure performance and trends and predict customer behavior (Emma, 2024). The business intelligence platforms, Tableau and Power BI, include tools that enable real-time data visualization. And predictive analytics that forecast market trends and customer preferences. (Turi & Li, 2022).

Some of its most significant advantages are greater flexibility to adapt to market trends, improved decision-making accuracy, and higher customer satisfaction. (Soltanifar & Smailhodžić, 2021). According to Vial (2021), the most significant indicator of the organization's ability to adapt to digital transformation is its capacity to analyze vast amounts of data and turn insights into actionable plans. It is this very dimension that measures how dependent organizations are on data analytics in their decision-making processes, thereby enhancing innovation and improving performance. They have all hinted that data analytics applications should be a fundamental practice within organizations in the modern digital economy.

The choice of data-driven decision-making (DDDM) falls into those that illuminate the mechanism of decision-making through data processing and knowledge derived from its findings. Instead of emotions and instincts, DDDM is based on objective, quantifiable data that can inform decision-making related to strategies and operations (Emma, 2024). DDDM is a process of collecting information, converting it into patterns and trends, and using the knowledge to make rational business decisions that can be verified and are open to change as new knowledge emerges about the data environment. Therefore, the emphasis of DDDM is on enhancing the accuracy and speed of decision-making at every level of the organization (Turi and Li, 2022).

2.2.3.3 Social Media Engagement

Social media has altered the way businesses engage with their clients. Instagram, LinkedIn, and TikTok are the platforms through which entrepreneurs promote their products and services and interact with customers efficiently and effectively (Drummond et al., 2020). The best methods of engagement are content marketing and influencer utilisation to increase the brand's reach, along with interactive campaigns such as live polls and question-and-answer sessions that improve two-way communication. Some of the most significant advantages include the ability to access the market at the lowest cost. The possibility of getting feedback, manifested in increased customer loyalty and the opportunity to understand customer preferences and needs (Ojo and Alias, 2020).

Online entrepreneurs are increasingly using social media platforms to reach their customers and build brand loyalty. Li et al. (2022) state that social media interaction is a marketing activity, no less than real-time feedback, and a community-building one. This aspect will gauge how well companies use various social media platforms to communicate with stakeholders and discuss market issues with them. A three-factor model, created and experimentally tested by Schivinski et al. (2016), assesses consumer involvement with information on brand-related social media content. In a study, Pentina et al. (2018) found that various forms of consumer-brand engagement on social media platforms differ in the effort and originality they require, ranging from low on the scale (e.g., following) to high (e.g., commenting). On the one hand, consumption is a lower degree of interactivity, in which consumers act as passive recipients of social media marketing information, such as reading a fashion blog or watching a video uploaded by a fashion company. The contribution suggests more interaction, with both peers and content on social networking sites, such as commenting on a post or sharing it with others. These interactions result in extensive content spread on social media, created by retailers or added by consumers themselves. At the opposite end of the participation scale is the creation of consumer-generated content shared on social networking sites; customers post pictures, vlogs, or write reviews of fashion or opinion articles. Therefore, this paper conceptualizes the three levels of engagement behavior: consumption, contribution, and creation.

2.2.3.4 Cloud-based collaboration

Collaboration is provided in real time through cloud-based tools such as Google Workspace, Microsoft Teams, and Slack, enabling teamwork more efficiently and

anytime, anywhere. Enabling remote work, centralized data storage, automating tasks, and making projects easier to manage are among its most significant applications in enterprise digitalization (Paul et al., 2023). Cloud collaboration will boost creativity, minimize operational problems, and enable faster, more flexible market response (Kolasani, 2023).

Cloud computing enables flexible, scalable, and efficient interaction among teams scattered across various geographies. Kraus et al. (2021) stress that modern business activities cannot be conducted without the tools enabled by the cloud, which allow the sharing of resources and communication without difficulty. This dimension aims to determine how extensively an organization uses cloud technologies to facilitate internal collaboration and operational flexibility.

According to Gupta et al. (2022), user-friendly and meaningful alerts can be generated through the application of AI and cloud-based collaborative platform technologies, as they understand the current context and past trends, thereby eliminating threats and providing sufficient preparedness. The technologies of AI and cloud-based collaboration platforms enable authorities to equip frontline employees to respond swiftly and efficiently by providing a platform to integrate information from predictions, observations, and sensors, as well as other geographical and non-spatial data from various sources (Akter and Wamba, 2019).

The technologies of artificial intelligence (AI) and cloud-based collaborative platforms are central to evaluating the impacted population, redesigning, or restoring supply chain networks, with stakeholders participating in the creation of the system (Cao et al., 2021; Fleming et al., 2020).

2.2.3.5 Personalized Marketing Using AI

Personalized marketing is based on the application of artificial intelligence algorithms to tailor content, suggestions, and offers to individual customer information (Haleem et al., 2022). Some of the artificial intelligence tools used in personalized marketing include recommendation engines that suggest products on websites like Netflix and Amazon based on users' past behavior (Razak et al., 2024). According to Vdovichena et al. (2024), chatbots can provide AI-powered robots to assist customers simultaneously, alongside dynamic pricing models that vary prices based on customer behavior, demand,

and competition. The effects of digitalization on enterprises include higher conversion rates and better returns on investment; enhanced customer experiences and loyalty; and the potential to satisfy market needs efficiently (Emma et al., 2024).

This study summarized the theoretical and empirical literature on developing a framework for enterprise digitalization (ED), in which digital technologies were presented as facilitators of new business strategies, processes, and value creation. The following dimensions identified- e-business optimization, data-driven decision making, social media engagement, cloud-based collaboration, and AI-powered personalized marketing- were not linearly derived out of a single framework. They were developed inductively from a reasonable adaptation of recent academic literature, which highlights the common aspects of digital transformation programs across different contexts.

2.2.4 Challenges in Enterprise Digitalization

The most significant challenges in enterprise digitalization are the following (Samara & Terzian, 2021): religious issues, related to the privacy of information and data, and adherence to laws and regulations.

- **Data Privacy and Compliance:** Data privacy laws that companies must comply with, particularly in data-driven decision-making, include the California Consumer Privacy Act (CCPA) in the United States and the General Data Protection Regulation (GDPR) in Europe. Lack of adherence may lead to detrimental fines and lack of client confidence (Alexander, 2019).
- **Cybersecurity risks:** Because companies are largely dependent on digital technologies, they are susceptible to cyber threats such as hacking and data breaches. Cybersecurity infrastructure is expensive and essential to protecting sensitive customer data and business information. A breach may lead to legal fines, financial losses, and damage to a firm's brand (Spremić and Šimunic, 2018).
- **Rapid technological change:** With the pace of technological advancement, the company must stay abreast of the latest technologies and tools. This is very challenging, as it is always required to continuously innovate systems, acquire new technologies, and incorporate new solutions. The failure to adopt new technologies in time may result in loss of competitive advantage (Kraus et al., 2019).

- **Digital Skills Gap:** Employee resistance to change. Digital strategies require a highly skilled workforce of digital tools and platforms. Many firms struggle to train, hire, and retain experienced talent. The insufficiency of digital skills might impede a company's development and creativity (Brunetti et al., 2020).
- **Fragmented Digital Ecosystems:** Palestinian SMEs operate within a digitally fragmented ecosystem. Limited cross-border data flows, inconsistent regional regulations, and scarcity of localized digital platforms impede scalability (Palestinian ICT Ministry, 2023). For example, while 78% of SMEs use social media, only 19% integrate it with backend systems for analytics (Al-Quds University, 2022). This disconnection prevents full exploitation of digitalization benefits, necessitating ecosystem-level interventions rather than firm-level solutions alone.

The studies have promised improvements in revenue generation, cost reduction, and the attainment of competitive advantage through the use of new technologies. Hence, one can say that digitalization can potentially impact any business, regardless of size or industry (Sohns & Revilla, 2018).

Enterprise digitalization is now fundamentally changing the strategy for new business development, and the fact that technology can radically transform the economic development landscape of regions is giving rise to a myriad of new demands for enterprise digitalization: the challenges they introduce are likely to become future business prospects. According to Kyriakopoulos (2022), economic development is closely linked to institutional development, indicating that the key issues in enterprise digitalization are the institutions that create or generate value for a company, including digital infrastructure, digital security and trust, financial resources, and digital skills. As such, businesses ought to allocate relevant capital to investments and other expenses associated with knowledge, preparedness, and awareness to take advantage of digitalization.

Digital entrepreneurs face numerous challenges. Not surprisingly, one such challenge is the uncertainty associated with new business models, which, in the case of Facebook and Google, is (Nambisan et al., 2019). These uncertainties stem from the rapid growth of digital technology and the evolving legal and tax regulations encountered after launching a business. Company-specific regulations pose an exceptional risk because most digital companies operate in a global framework. The development of technology is

indeterminate, and it takes place in indeterminacy. In response to these, a digital entrepreneur must constantly seek market feedback, create products, services, and infrastructure, and build feedback loops (Ghezzi & Cavallo, 2020).

Another case would be finding the right investors with the right money. Strong ties and the help of people who deserve recognition create substantial legitimacy for the business model (Hommel and Bican, 2020). The digital entrepreneur, in turn, must remain constantly innovative and differentiate themselves. However, they are not using the platform's technological capabilities to their full extent. The present-day digitization of enterprises has created new structural barriers, including the potential demise of interpersonal trust in these virtual spaces, which could jeopardize customer engagement and loyalty. Nevertheless, these obstacles might be overcome and eventually translated into competitive advantages through trust-based innovations among companies that leverage productive customer feedback loops and foster digital openness in their interactions with customers (Gupta et al., 2023).

2.3 Innovation

Innovation is one of the processes a company or organization undergoes, and the administration and monitoring of this process should be defined as a systematic process (Morabi et al., 2021). Hanifah et al. (2019) also state that innovation matters because it is among the variables that define a company's performance and outcomes, and that enhancing an innovation culture is critical. According to Saunila (2016), an appropriate definition of innovation measurement contributes to understanding the innovation being discussed, the potential to enhance performance, and the culture of innovation.

Innovation in teams relies on organizational workgroups. Heterogeneous people from various backgrounds work together for only a short time to generate innovative ideas. Working in teams can have a significant impact on innovation and, hence, create success for the business, because teams combine multiple resources, including knowledge and perspectives, which can enhance existing solutions. Innovation is a driver of value creation within organizations and the key to the competitiveness and productivity of nations (Surya et al., 2021). Investment in innovation, especially by firms, has been significant in both OECD and non-OECD economies (Li et al., 2022). Innovation creates corporate value by introducing new technologies and expanding into new markets. A

commonly used definition of innovation provided in the fourth edition of the Oslo Manual (2018) is as follows: an innovation is a new or an improved product or a process (or a combination thereof) that is very different to the previous products or processes of the unit and made available to the potential users (product) or implemented by the unit (process) (Eurostat, 2018). There are four types of innovation: product, process, marketing, and organizational.

Schumpeter (1934) was the first to focus on innovation and highlighted the vitality of technical innovation for economic development and competitiveness. Since this initial notion, the studies of innovation have thrived. Schumpeterian theory holds that large, established companies have greater innovation capabilities than SMEs because innovation requires significant market power, and entry barriers deter SMEs from pursuing it. However, recent studies reported that SMEs are more effective in innovation processes and exhibit superior capabilities, even with inherent limitations in resources, human capital, management structures, and immature capabilities and infrastructure (Edeh et al., 2020). The organizational structure of SMEs makes it easier to convert tacit information to explicit knowledge (Castillo et al., 2022).

The literature has categorized innovation into different taxonomies based on the following distinctions: Radical vs. Incremental; Product vs. Process; and Open vs. Closed innovations (Crossan and Apaydin, 2010). All of these frameworks offer different perspectives on how innovation can be researched in relation to the environment and the study's goals. In the present case, when making a research contribution on the mediating role of innovation between the digitalization of the enterprise and its competitive advantage, the most suitable and analytically relevant classification of innovations is technological and non-technological.

Technological innovation focuses on new products, services, or valuable improvements in production and delivery. Such innovation tends to implement new digital technologies to create new products or improve current products, which perfectly aligns with the objectives of enterprise digitalization (Ortigueira-Sánchez et al., 2022). Non-technological innovation, however, involves new organizational structures, management practices, and business processes that would restructure how value is generated and delivered. These innovations are directed towards administrative

processes, strategic reshaping, and human capital building, and, as such, are central to retaining generalized transformation as an enforcer of digital tools.

This category aligns with the dichotomy of innovations in the digital era, where the technical capacities of innovations and organizational dynamism are summoned to realize sustainable competitive advantages. The technological aspect addresses the output aspect of innovation, which is what is created, whereas the non-technological aspect addresses the process aspect, or what is created and applied.

One of the most common definitions of innovation is the process that drives economic growth and a nation's competitiveness, as well as broader societal development (Apostu et al., 2022). It provides organizations with the opportunity to enhance productivity, foster entrepreneurship, and create new markets and sectors, thereby boosting overall prosperity and economic stability. Also, innovation plays a critical role in addressing global issues such as climate change, health-related socio-economic inequality, and resource scarcity. The innovation alternative, implemented through disruptive technologies and sustainable solutions, can transform entire sectors to improve global living standards (Ramírez-Montoya et al., 2022).

In particular, innovation enhances organizational agility, increases creativity, and makes it responsive to changing market conditions (Costa & Matias, 2020). Companies whose innovation is at the core of their strategy have an opportunity to differentiate themselves from the competition, meet the changing demands of their customers, and pursue expansion opportunities in a more volatile world. In addition, innovation improves inclusive development by offering all groups equal access to opportunities, empowering marginalized groups, and enabling individuals and communities to tackle systemic problems to realize their full potential in achieving sustainable development.

Although the basic knowledge about the importance of innovation as the core of economic growth was developed by Schumpeter (1934), this notion has changed considerably, especially in the digital economy and with regard to SMEs. The international standard of collecting and interpreting innovation data, the Oslo Manual (2018) defines it in a lengthy way: an innovation is a new or improved product or process (or a combination of both) that cannot be considered identical to those offered by the unit

before and has been made accessible to potential users (product) or implemented by the unit (process). This definition summarizes four major kinds of innovation:

- **Product Innovation:** Introduction of a new or a greatly enhanced good or service in terms of its features or intended purposes. This involves drastic changes to technical specifications, components, and materials, built-in software, usability, or other practical features. To a Palestinian SME, this might be a handcrafted product made from contemporary, durable materials, or a software product that meets the needs of the local market.
- **Process Innovation:** Usually, the introduction of a new or a much better process of production or delivery. This involves major modifications in techniques, equipment, and/or software. For SMEs, this may involve transitioning to digital solutions, such as cloud-based inventory management or automated customer relationship management (CRM) systems, to improve efficiency.
- **Marketing Innovation:** The implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion, or pricing. The use of AI-driven personalized marketing, as discussed in the dimensions of ED, is a prime example of marketing innovation.
- **Organizational Innovation:** The implementation of a new organizational method in the firm's business practices, workplace organization, or external relations. This includes implementing flexible work arrangements (e.g., remote work supported by cloud collaboration), integrating suppliers into the design process, or creating new knowledge management systems.

2.3.1 Innovation within SMEs: A Distinct Paradigm

The concept of innovation is multidimensional, encompassing different types of change and development within organizations. Information on its sizes is required to analyze the role innovation plays in providing businesses undergoing digital transformation with a competitive advantage. The majority of scholarly publications that are motivated by the Oslo Manual (OECD, 2018) and by Crossan and Apaydin (2010) and Cantarelli and Genovese (2022) categorize innovation into four dimensions:

This is composed of the invention of new goods or services, or what is seen as new or greatly enhanced in relation to the intended application, technicalities, or even performance. Product innovations are typically seen as responses to shifting customer needs or technological opportunities (Opazo-Basáez et al., 2022).

This entails implementing new or significantly improved production or delivery methods. These methods may include changes in equipment and/or software and are aimed at improving operational efficiency, reducing costs, or enhancing quality (Tegethoff et al., 2023).

Organizational innovation is the embracement of novel practices in business operations, the organization, or relations with external stakeholders. These are new practices whose primary aim is to enhance an organization's internal operations regarding processes, communication, and decision-making (Bataineh et al., 2024).

This dimension is associated with the use of new marketing plans that entail substantial modifications to product design, packaging, promotion, or pricing procedures. Marketing innovation aims to meet customer needs more effectively, enter new markets, or repackage a firm's existing products (Olazo, 2023).

The dotted dimension thus encompasses technological and non-technological types of innovation, creating a clear window through which firms can be observed as they renew and generate value in the dynamic environment. Technological developments are evidently aligned with innovations on the product and process fronts. In contrast, innovations in the field of organization and marketing demonstrate a distinct strategic and managerial change (Ortigueira-Sánchez et al., 2022).

Based on these dimensions, albeit in the nature of interrelationships, the study assumes a structured framework against which the role of innovation in mediating the multidimensional competitive advantage of enterprise digitalization is analyzed. The study addresses unidimensionality in its general sense.

Innovation within SMEs differs fundamentally from that in large corporations. Whereas big companies tend to rely on institutionalized R&D functions and substantial funding, SMEs leverage their natural agility, proximity to their customer base, and innovativeness (Hossain and Kauranen, 2016). They have less formal innovation

processes that are more incremental in nature and directly focused on addressing customer issues. Nevertheless, they also have notable limitations, such as insufficient financial resources, a lack of specialized expertise, and insufficient time to devote to non-operational tasks (Nasr et al., 2021).

Digitalization can serve as a powerful equalizer, enabling SMEs to access tools and capabilities previously exclusive to large companies. Cloud computing provides access to high-end infrastructure at a fraction of the cost of a large-scale investment. Social media creates inexpensive market research and direct lines of communication. Data analytics tools enable SMEs to understand customer behavior in ways previously unimaginable. As such, the mutual dependence between Enterprise Digitalization and Innovation is not only a correlational but also a causal relationship, in which digital tools facilitate and drive innovative processes across all four categories outlined in the Oslo Manual.

2.3.2 Contextual Innovation Typologies in Resource-Constrained Environments

Traditional models of innovation might not be the most effective way to understand SMEs in the particular Palestinian context, where resources are limited, and the market is volatile. That is why it is essential to take into account other typologies of innovation:

- **Frugal Innovation:** Also known as constraint-based innovation, it involves creating simpler, cheaper solutions for consumers with low purchasing power (Bhatti et al., 2018). This is not about making lower-cost, lower-quality products, but about re-engineering value propositions to do much with less. For Palestinian SMEs, this might involve developing cheap water purification systems or educational software compatible with low-spec hardware.
- **Bricolage Innovation:** This is the act of working with what is available by putting resources available to emerging challenges and opportunities (Baker and Nelson, 2005). An SME can repurpose a social media platform such as WhatsApp for supply chain management, or use a basic spreadsheet application to develop a complex project management tool. Digitalization enhances bricolage by offering a versatile toolkit of multipurpose platforms.
- **Open Innovation:** This paradigm underscores that firms cannot and need not depend on internal R&D only. In their place, they ought to use outsourced ideas and

avenues to market (Chesbrough, 2003). For Palestinian SMEs, this could involve collaborating with universities on research, participating in global hackathons, or using crowdsourcing platforms to fund and develop new ideas. Digital platforms are the primary enablers of open innovation, breaking down geographical and institutional barriers.

These typologies are highly relevant to the Palestinian context and represent specific mechanisms through which digitalization can be translated into tangible, competitive outcomes.

2.4 Competitive Advantage

Competitive advantage is a concept that is used to describe the fact that the company is able to develop and execute strategies that place it at a better position than the rest of the companies in the same activity and gain a competitive advantage due to the optimal utilization of the technical, material, financial and organizational capabilities and resources and also gain a competitive advantage due to the capabilities, competencies, knowledge and other capabilities that the company has possessed enabling it to design and execute its competitive strategies (Laszlo and Zhexembayeva, 2017). The two fundamental dimensions are associated with achieving competitive advantage, including the perceived value to customers and the company's ability to attain excellence (Desfitrina et al., 2019).

According to Darmawan and Grenier (2021), the competitive advantage is the capacity of sectors to respond to the needs of customers in terms of services and products and deliver them in high quality to satisfy customers, and address the needs of employees in the company, giving back to investment and achieving growth and development, and attaining the desired goals and objectives.

Although Išoraitė (2018) identifies competitive advantage as a set of factors directly and indirectly related to the firm's market stability, it also involves its active involvement in economic spheres that influence stability and the formation of profits through the optimal utilization of available resources.

Within the scope of this study, competitive advantage refers to a firm's ability to strategically leverage digital and organizational resources to deliver superior value to

customers, maintain differentiation against rivals, and ultimately achieve market performance.

This definition considers external outcomes (such as customer satisfaction and market success) and internal facilitators (such as innovation and resource optimization), and aligns with this research's perspective on digital transformation.

Competitive Advantage (CA) is the central construct this research seeks to explain. It is the attribute that enables an organization to outperform its competitors consistently. A firm is said to have a competitive advantage when it implements a value-creating strategy that is not simultaneously implemented by any current or potential competitors (Barney, 1991).

2.4.1 Importance of Competitive Advantage

Competitive advantage entails strategic and operational excellence that is guaranteed within business organizations in the face of a highly sophisticated, rapidly changing business environment. This reality is echoed by Negulescu (2019), who states that competitive advantage will put an organization in a qualitative and quantitative advantage over its competitors, thereby introducing high performance and outcomes. According to Hakim et al. (2023), it is not only a way for one organization to lead in operational efficiency but also to sell the best-value products to its customers, which gives it a firmer foothold in its market.

The enhanced performance of organizations, as perceived by customers and stakeholders, is driven by competitive advantage. Farida and Setiawan (2022) state that customers are loyal and dedicated to ongoing, progressive interactions with the company when the company maintains a strong value proposition based on its service or product. These strands of connections play a pivotal role in ensuring long-term success.

Competitive advantages being dynamic, they are not fixed and static but in a very progressive trend in terms of organizational renewal and adaptation capacity. This dynamicism will enable companies to achieve continuous improvement and strategic nimbleness in an uncertain, constantly evolving market. Uddin et al. (2023) assert that a company's competitive advantage is a particular configuration of resources,

competencies, and domain knowledge that drives internal innovation while limiting operational dynamism.

Two theories of competitive advantage are dominating:

1. **The Industrial Organization (I/O) View (Porter, 1980):** This school of thought is based on the Five Forces model, which holds that a firm's performance depends more on the desirability of the industry's external environment. This industry is also competitive through strategic positioning: either as a cost leader (Cost Leadership Strategy) or with a unique product that customers appreciate (Differentiation Strategy). For SMEs, this can mean specialization in a given niche market (Focus Strategy).
2. **The Resource-Based View (RBV) (Barney, 1991):** The RBV also shifts the emphasis from the external environment to the resources the firm has that provide it with an advantage. It claims that sustainable competitive advantage is based on owning and utilizing valuable, rare, inimitable, non-substitutable (VRIN) resources and capabilities. These assets are becoming more intangible in the digital age: information, digital literacy, creative culture, and proprietary algorithms.

The approaches of this study are closer to the RBV, since it examines how internal capabilities, in this case, the usage of digital technologies (ED) and the resulting innovation, can be developed into VRIN resources, which produce competitive advantage.

Therein, they hold that competitive advantage is a key element of the organization, serving as the motive engine of excellence not only in improving customer perceptions but also in integrating all activities in the quest for sustainable growth in the sense of an adaptive, value-based strategy. Competitive advantage does not merely mean that firms can outshine the competition in the short term, but also in the long run, in terms of relevance, agility, and value-creation (Van Nguyen and Ngoc, 2024; Rianawati et al., 2024).

2.4.2 Sources of Competitive Advantage

The essence of strategic management theory is understanding the origins of competitive advantage, which explains why some firms consistently perform better than others in the same industry. Traditionally, the discussion has been dominated by the classification of resources into physical, human, and organizational capital. The digital economy, however, has significantly changed this paradigm. In the modern world, the capacity to be innovative and to digitalize the enterprise strategically has become the two key pillars that dynamically define a firm's strategic position and long-term sustainability.

This knowledge is based on the Resource-Based View (RBV), which holds that a firm's competitive advantage arises from its bundle of valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities (Barney, 1991). During the pre-digital epoch, these resources were usually tangible: state-of-the-art manufacturing plants (physical capital), a highly skilled workforce (human capital), and efficient organizational structures (organizational capital). Although these traditional sources have not become obsolete, their strength is now vastly enhanced, or even replaced, by digital sources. According to Marakova et al. (2021), an organization's ability to implement effective strategies depends on tangible and intangible assets, yet the tide has permanently shifted toward the latter.

In this situation, enterprise digitalization can be considered a source of transformational advantage, enabling businesses to reconstitute their operations. This is not simply about automating processes; rather, it is about rethinking the entire value chain. For example, companies can automate essential processes using digital technologies, deliver customer experiences at scale, and switch from intuition-driven to data-driven decision-making. Digital capabilities, including basic cloud computing and advanced integrated digital platforms, enable firms to respond quickly to changing market dynamics and customer needs (Guo and Chen, 2022; Wang and Ma, 2024). These abilities not only drive operational efficiencies but also create a cycle of broader strategic innovation in which digital tools drive innovation, which in turn supports the firm's competitive position.

This digital advantage can play out in various ways. To start with, digitalization of cost leadership is possible through the automation of repetitive processes, the optimization of supply chains with real-time data, and the implementation of a remote-

work model that minimizes physical overheads. Second, digital tools are potent for differentiation. Individualized marketing, 24/7 customer service via intelligent chatbots, and the development of new digital products or services are some ways a firm can stand out in a saturated market. The third and deeper process is the ability to build new markets and business models. Network effects can be unlocked through a digital platform, meaning the service's value increases with each new user who joins, forming a strong competitive moat that is hard to cross.

These digital advantages are especially essential for Small and Medium-sized Enterprises (SMEs). SMEs might not be endowed with extensive physical capital compared to larger corporations; however, they can tend to adopt digital technologies more quickly by leveraging their natural nimbleness to embrace and position them. A SME that uses data analysis to develop a niche market (or social media to foster a strong community around its brand) can gain a competitive advantage that wasn't there before. Nevertheless, the concept of digital maturity should be raised. The adoption of individual digital tools does not guarantee the establishment of sustainable advantage; rather, it depends on the extent to which they have been developed and embedded in the firm's core strategy, culture, and operations. Being digitally mature, SMEs have moved from merely engaging in e-commerce to a stage where data drives every strategic decision, collaboration across cloud platforms is seamless, and continuous digital transformation is integrated into the organizational DNA. This profound, endemic embrace of digitalization, along with the brutal emphasis on novelty, ultimately constitutes the new frontier of competitive advantage in the digital age.

2.4.3 Aspects of Competitive Advantages

The field that covers different dimensions of competitive advantages possesses numerous traits that are based on other attributes (Gareche et al. 2019). For example, the most important part of building capacities focuses on the exploitation of available capabilities and their continuous improvement to meet ever-changing demands (Shams, 2016). It only marks the intrinsic value of existing resources, ensuring continuous growth. Correspondingly, there is a need to increase efficiency, which means tightening regulations on loss and waste and, respectively, improving the competence of all employees across different projects and areas of operations (Wagner and Hollenbeck,

2020). These operations prove beneficial in the long term for planning and resource optimization.

Simultaneously, experience plays a significant role; the longer the company has gained experience within the timeframe, the better it is prepared to withstand challenges and new situations (Herden, 2020). It is based on this experience that this kind of development is required to be resilient and adaptive. Employee know-how refinement is another essential component; it ensures that employees are familiar with the relevant tools, methods, and mechanisms in accordance with established procedures and guidelines (Chadwick and Flinchbaugh, 2021). This particular skill acquisition is essential for maintaining high performance and achieving operational excellence.

It is also in production that the creative aspect of talent can be given full expression of the potential the individual may have. Nasifoglu Elidemir et al. (2020) state that creative productivity would not simply be maximized by placing people in jobs they find easy to perform. This, in its turn, leads to a more cooperative workplace that is favorable to the organization. Therefore, activating exceptional talents, or, in other words, activating the queens, involves identifying individuals with unusual talents and focusing their expertise on product development, innovation, and research (Ali and Anwar, 2021). The effect of implementing this strategy is increased efforts to develop breakthrough innovations and, concurrently, to improve the organization's position against competitors. The combination of these factors constitutes a holistic framework for pursuing and maintaining competitive advantage in the dynamic market environment of the present.

2.5 Theoretical Framework

It explains the contribution of each theory to understand the mechanisms linking digital transformation, innovation, and competitive advantage.

2.5.1 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) of the firm is a school of strategic management that explains competitive advantage in terms of the resources possessed by the firm and their strategic utilization as valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). The RBV suggests that the persistent performance differentials in competing firms are based on the internal assets of a firm (both tangible and intangible).

Given the digitalization of the enterprise, RBV emphasizes the roles of digital capabilities, knowledge assets, and innovation competencies as strategic resources that can help firms move toward competitive advantage (Liu and Liang, 2015).

Digitalization empowers SMEs to create and utilise new strategic resources, including big data insights, automated infrastructure, and digitally enabled customer intelligence. When effectively harnessed, these resources can increase product development and operations and develop unique value propositions. When these digital systems are integrated with innovation capabilities, they are integrated as fundamental organizational competencies that competitors have a hard time imitating- therefore qualifying as the VRIN requirements of the RBV (Teece, 1997).

RBV is a supplement to the Social Exchange Theory (SET) because it provides an internal organizational perspective on the functioning of digitalization and innovation as a resource that can generate competitive advantage. RBV emphasizes inwards, implying that internally developed digital capabilities and innovation practices are used as strategic assets. In combination, the two theories can provide a complete picture of the model: enterprise digitalization results in relational exchange (SET), which, in turn, facilitates innovation and resource development (RBV), thereby improving competitive advantage.

This paper has examined the two sides of the digital transformation coin: one as an external value co-creation platform and the other as an internal strategic resource-generating platform. This synthesis is especially applicable in the SME context, where companies need to leverage relational capital and innovation potential to remain and grow in a dynamic, competitive market.

2.5.2 Dynamic Capabilities Theory (DCT)

DCT is a dynamic capacity that is formulated by Teece, Pisano, and Shuen (1997) and extends the Resource-Based View by incorporating one more dimension that is related to not only the possession of valuable resources but also the ability of the firm to integrate, develop, and reconstruct internal and external competencies to cope with the rapidly changing environment. This DCT enterprise digitalization (ED) is embedded in the description of how enterprises develop adaptive and innovative capabilities, driven by digital transformation.

Digitalization has introduced new technologies and market dynamics, mirroring the constant learning, adjustment, and novelty of companies. According to DCT, sensing (discovery and identification of new opportunities and technological changes), seizing (satisfaction and availability of assets towards the possibility), and reconfiguration (integration, rebuilding, and changing of existing capabilities to the new demand) are the three dynamic capabilities that a firm should have (Teece, 1997). These powers are especially applicable in digital settings where technological lifecycles are short, and the pace of innovation is often rapid.

In this theoretical approach to research, DCT is the most qualified of the Resource-Based View (RBV). It is interesting to note that, whereas RBV emphasizes leveraging internal resources, DCT consequently enables organizational agility and learning processes through which resources and relationships must be revised and restructured in response to an uncertain environment.

Dynamic capabilities in digital enterprises encompass integrating artificial intelligence into marketing efforts, leveraging cloud-based platforms to reach customers, and reconfiguring business models in response to market disruption. These are strategic responses deemed crucial to organizational resilience and to the gain and maintenance of competitive advantage in uncertain and dynamic environments (Teece, Pisano, and Shuen, 1997; Srinivasan and Venkatraman, 2022).

Therefore, DCT is a primary third pillar of the theoretical foundation of this study, according to which the capabilities of enterprise digitalization and innovation may dynamically interact to create and maintain competitive advantage.

2.6 Hypothesis Development

This section develops the hypotheses, explaining the theoretical reasoning and empirical evidence that support each proposed relationship. Each hypothesis is introduced based on relevant literature and the conceptual relationships among the study variables.

2.6.1 The Main Hypothesis

Nambisan (2021) defines enterprise digitalization (ED) as the use of digital technologies in business operations to make operations more efficient, improve market responsiveness, and enhance value creation for businesses. In the context of SMEs, ED refers to the application of tools such as artificial intelligence, cloud computing, digital platforms, and data analytics to drive innovation, enhance customer engagement, streamline workflows, and achieve a sustainable competitive advantage. SMEs use digital tools such as artificial intelligence, big data analytics, cloud computing, and digital platforms to streamline operations, engage customers, and respond to changing market dynamics (Zaheer et al., 2023). The Resource-Based View (RBV) holds that firms that apply digital technologies as strategic resources eventually develop unique capabilities and maintain a competitive advantage (Barney, 1991). Empirical studies show that SMEs that have invested in digitalization achieve superior market position, cost efficiency, and differentiation (Tajudeen et al., 2022).

The process of innovation is what creates competitive advantage through the transformation of digital capabilities. Digitalization of an enterprise improves the innovation process by enabling companies to discover new business models, accelerate product development, and simplify service delivery (Srinivasan & Venkatraman, 2022). The Dynamic Capabilities Theory (DCT) reveals that to facilitate innovation and competition in the market, firms must constantly integrate, reconfigure, and transform their digital resources (Teece et al., 1997).

A number of empirical studies emphasize that enterprise digitalization triggers both technological and non-technological innovation, including process innovations, organizational design, and marketing innovations (Bresciani et al., 2021). SME innovators who use digital technologies strengthen their innovation power, and differences in market focus and market presence become even more significant (Mariani and Fosso Wamba, 2023). Based on the fact that innovation is one of the main processes according to which digitalization will be converted into a competitive advantage, the hypothesis is as follows:

The Schumpeterian Innovation Theory is based on the principle of economic development through entrepreneurial activity as a source of competitive advantage based on innovation (Schumpeter, 1934). For SMEs, enterprise digitalization enables

exploration and capitalization on digital opportunities, resulting in the creation of innovative solutions that create a competitive edge against other companies on the market (Autio et al., 2021). Furthermore, research highlights the increased potential of such socially responsible SMEs, which possess high digital capabilities, to become radically innovative in terms of improved performance and sustainability (Del Giudice & Maggioni, 2022). There is literature evidence regarding the mediating effects of innovation in other entrepreneurial situations. For example, a recent study by Li et al. (2023) found that digital transformation enterprises facilitate innovation, creating a competitive advantage for SMEs. Similarly, their research demonstrates that Kraus et al. (2022) believe that the significant effect of digital SMEs on an organisation's performance is increased innovation.

As Zhai et al. (2023) observed, ED has received increased attention in the last three decades, specifically after 2013. There are hundreds of periodicals, publications from many countries, and more than 1,000 authors who have worked in this field. The 3E (empower, evolution, and ecosystem) model of DE, proposed by Zhai et al. (2023) based on keyword co-occurrence clustering and co-citation clustering, was proposed to foster multidisciplinary debate in the creation of evidence-based policies and practices. Future researchers should focus on theoretical studies and discuss enterprise digitalization (ED) from both holistic and dynamic perspectives, with attention to the negative influence of digital technology on entrepreneurial activities. According to Antonizzi and Smuts (2020), the features of enterprise digitalization and digital transformation, along with their connections, are complex and essential to understand in the modern digitalized world. This understanding of enterprise digitalization is seen as a key factor in economic growth, job creation, and innovation. However, particular challenges associated with enterprise digitalization and digital transformation remain, preventing digital entrepreneurs from fully realizing the benefits of enterprise digitalization in corporate value. The business model innovation may be viewed as a significant source of competitive advantage, and the issues associated with alterations in the components of the organization's business model should be studied (Schneider and Spieth, 2013; Spieth et al., 2014).

Furthermore, innovation and entrepreneurship are two interconnected and ongoing processes, as innovation is the source of entrepreneurship and entrepreneurship facilitates innovation in developing and realizing its maximum economic and social value (Brem,

2011; Zhao, 2005). Almazmomi (2022) demonstrates that a data-driven culture is not particularly significant for product novelty. Thus, the primary hypothesis of the proposed research is the following, based on this analysis:

H1: There is a relationship between ED and competitive advantage in SMEs.

H2: The relationship between ED and competitive advantage in SMEs is mediated by innovation .

Hypothesis 2, therefore, holds that enterprise digitalization (ED) and competitive advantage (CA) are driven by innovation among SMEs. Both RBV and DCT provide a theoretical lens on how internal resources are transformed, and capabilities reconfigured, a viewpoint that aligns with sociality, as in the Social Exchange Theory.

In digitalized businesses, two-way communication with clients, suppliers, and employees is also being digitized and is frequently conducted via CRM systems, social media, and AI-powered chatbots.

Relational dynamics drive innovation. To provide examples, digital tools that enable co-creation between customers and firms, or collaboration within cross-functional teams within firms, can generate knowledge spillovers that eventually lead to new product ideas, service enhancements, or process innovations.

Therefore, SET confirms this hypothesis by demonstrating that ED promotes innovation in both technological capability and greater stakeholder interaction, which is inherently social and exchange-based. Subsequently, the innovation generated will add value to the CA by providing it with unique market agility and responsiveness.

2.6.2 The Sub-Hypothesis

The evaluation of the *specific dimensions of digitalization will enable the placement of the connection between enterprise digitalization and SME competitive advantage into perspective*. This is the *central* concept of the research, which alludes to *a recent piece on compiling sub-hypotheses based on empirical studies and theoretical clarity*.

E-commerce Use and Competitive Advantage

The relationship between e-business and competitive advantage was discussed by Pilinkiene et al. (2013), who argued that digital formats enhance operational efficiency but are unlikely to translate directly into profits. On the same note, Hariandi (2019) concludes that e-business, in general, does not have a direct impact on firm performance but derives its advantage indirectly through its impact on competitive advantage. However, Chen and Zhang (2015) affirmed that any company that seeks to leverage digital tools in the market to achieve competitiveness requires IT investment. Recently, Hussain et al. (2022) found that e-commerce optimization positively influences firm performance. Baskoro (2024) also states that customers should be the focus of digital operations, primarily through AI and blockchain, to help organizations become more responsive.

Ha1: There is a relationship between **e-commerce use**, as a facet of enterprise digitalization, and the competitive advantage of SMEs.

Business Analytics Capability and Competitive Advantage

According to Ramadan et al. (2020), the efficacy of big data analytics was largely dependent on the data. In that regard, DDDM demonstrated its ability to enhance its capacity to innovate. According to Gehrman (2020), the extent to which enterprises incorporate DDDM into their innovation processes depends on the organizational context and the stage of innovation. Conversely, Medeiros and Maacada (2022) argue that data generation processes and the use of visualization tools are key antecedents of the effectiveness of business analytics, which, in turn, culminate in enhanced competitive advantage. Similarly, Kolawole (2024) wrote that business analytics ability in the current data-intensive economy is one of the fundamental facilitators of differentiation in the market:

Hb1: There is a relationship between **business analytics capability**, as a facet of enterprise digitalization, and the competitive advantage of SMEs.

Hc1. Social Media Capability and Competitive Advantage

The potential of social media has now become a necessary component of SMEs' online plans. According to He et al. (2016), user-generated content has become popular as a driving force of strong competitive behavior. According to Marolt et al. (2022), social

relationship capabilities do not serve as a good mediator of the effects of social media on competitive advantage. Cheng and Chiu (2019) affirmed that the concept of social customer relationship management (S-CRM) with social networking enhances innovation by improving customer engagement. One of the signs that Nurfarida et al. (2021) identify is that implementing social media tools can enable SMEs to become more customer-focused, thereby enhancing overall performance. The results of the studies in the above give birth to the following:

Hc1: There is a relationship between **social media capability**, as a facet of enterprise digitalization, and the competitive advantage of SMEs.

Cloud Computing Capability and Competitive Advantage

Recognizing that cloud computing has the potential to revolutionize small and medium enterprises, Ross and Blumenstein (2015) also cautioned that the adaptation process is relatively complex. Al-Mutawa and Al-Mubarak (2024) also noted that the ease of use of simple cloud tools, their reliability, and the opportunities for collaborative applications affect the sustainability of SMEs. According to Fakieh et al. (2016), cloud services have led to increased innovation and greater openness in market channels, thereby facilitating SA's ability to compete globally. Therefore, cloud computing is also an asset for firms planning to be digitally flexible and scalable. Considering these, the following is the hypothesis:

Hd1: There is a relationship between **cloud computing capability**, as a facet of enterprise digitalization, and the competitive advantage of SMEs.

He1. AI-Driven Personalized Marketing and Competitive Advantage

The application of artificial intelligence in marketing has become increasingly popular as part of SMEs' online strategies. Abrokwah-Larbi and Awuku-Larbi (2023) found that AI marketing enhances the financial performance of SMEs in Ghana, as well as customer satisfaction and learning. Maxwell (2023) also noted that artificial intelligence enables marketing strategies to be more cost-effective and targeted. Yet, Wang et al. (2022) found that the adoption rate of intelligent systems among Chinese SMEs is on the rise despite challenges. These articles show the transformational impact

of AI on customer relationship management and strategic positioning. It is thus theorized here:

He1: There is a relationship between **AI-driven personalized marketing**, as a facet of enterprise digitalization, and the competitive advantage of SMEs.

2.6.3 Study Model

The relationship between entrepreneurial digitalization, innovation, and competitive advantage has received significant attention in the scholarly literature over the last decade. This part examines empirical literature on these relationships, specifically focusing on small and medium-sized enterprises (SMEs). The review is structured in such a way that it discusses three critical areas: (1) how enterprise digitalization directly affects the competitive advantage, (2) the mediating effect of innovation in this relationship, and (3) contextual factors that drive such processes in SMEs. This section will identify established knowledge, emerging trends, and research gaps that other researchers should investigate to fill them.

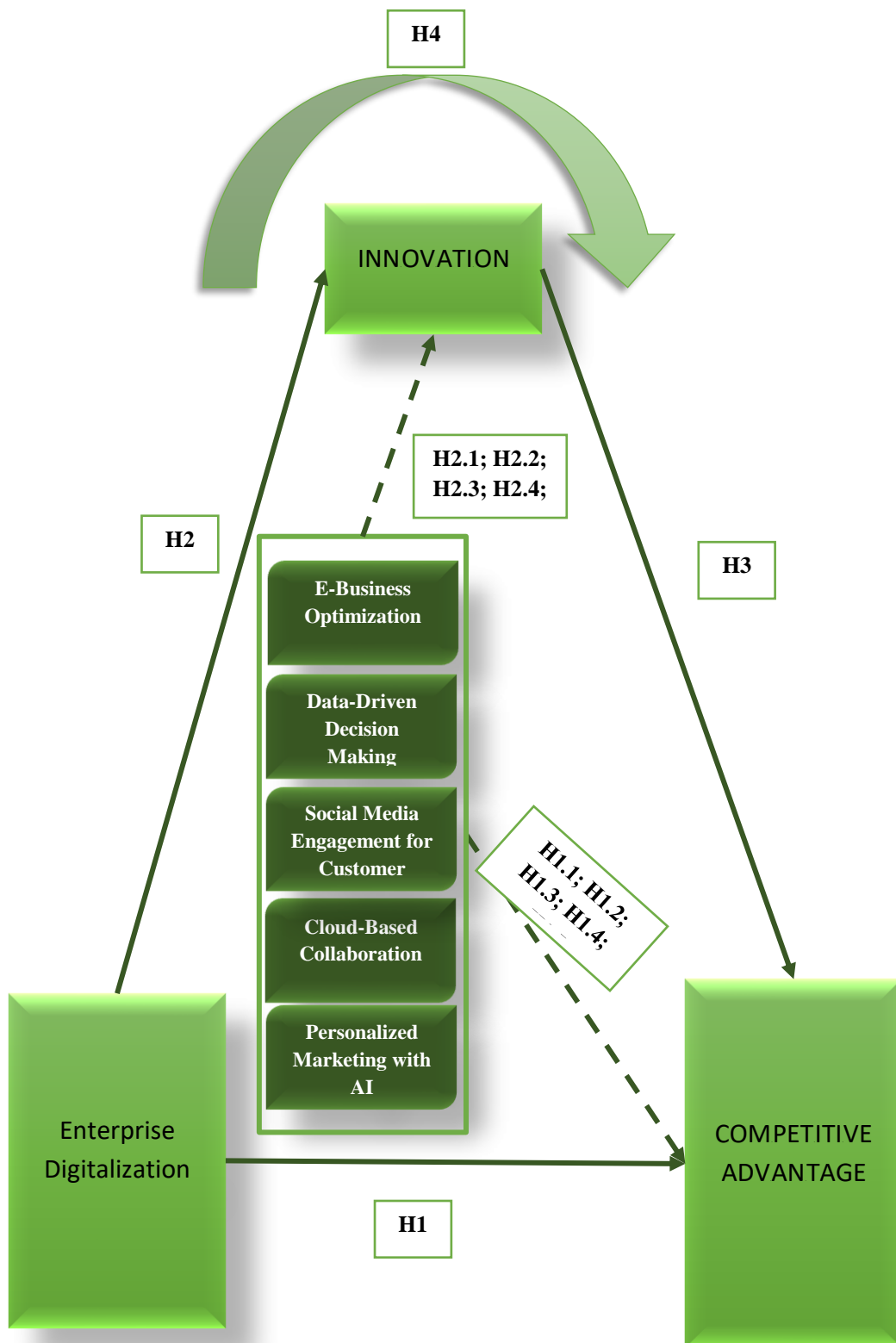


Figure 2.1: Study Model.

2.7.1 Enterprise Digitalization and Competitive Advantage

Much literature has been compiled on the direct relationship between the digitalization of an enterprise and competitive advantage in various organizational settings. Li et al. (2020) conducted a systematic analysis of 486 Chinese manufacturing companies and found that digitalization has had a strong impact on competitive advantage, enhancing operational efficiency and market responsiveness. They found that more digitally integrated firms performed better than less digitally integrated firms in cost reduction, quality improvement, and customer satisfaction.

On a similar note, the study by Kraus et al. (2021) examined digital transformation practices among 312 European SMEs and found that digitalization initiatives were positively associated with competitive advantage. In their research, they identified five critical dimensions of digitalization: digital business models, digital customer experience, digital operations, digital organization and culture, and digital infrastructure. The results implied that SMEs that adopted digitalization across multiple levels, rather than through single initiatives, had the greatest competitive advantage.

Vial (2021) studied 217 service companies across various industries and found that digital transformation conferred competitive advantage in two major ways: value creation and value capture. Value creation involved developing new digital products and services, whereas value capture involved streamlining internal processes to cut costs and enhance efficiency. The research has shown that companies that managed to attain both mechanisms simultaneously achieved the greatest competitive benefits.

A number of studies have been dedicated exclusively to specific dimensions of digitalization and its effects on the competitive advantage. For example, Appel et al. (2020) examined the use of social media among 324 SMEs. They found that the strategic use of social platforms increased brand awareness, loyalty, and, ultimately, the competitive edge. Likewise, Marston et al. (2011) showed that cloud-based collaboration tools enhanced an organization's agility and knowledge sharing, translating into competitive advantage among 186 technology companies.

A considerable amount of attention has also been paid to the relationship between competitors' advantage and data-driven decision-making. A multi-case study of organizations that had adopted analytics capabilities, conducted by Provost and Fawcett

(2013), revealed that data-driven approaches led to superior strategic decision-making, operational efficiency, and competitive positioning. Later, Aktar et al. (2016) broadened this study by showing that the complexity of analytical facilities moderated the strength of this relationship, and that organizations that used advanced analytics had greater competitive advantages.

2.7.2 Innovation as a Mediator

Although the direct link between enterprise digitalization and competitive advantage has been well established, scholars have focused more on how digitalization can be translated into competitive advantage. Innovation has become one of the most important mediators in this relationship, and several studies have examined the role of digitalization in enhancing innovation capabilities that, in turn, can boost competitive advantage.

Nambisan et al. (2019) have thoroughly reviewed the literature on digital transformation, suggesting that digitalization can radically transform innovation processes by enabling new approaches to ideation, development, and commercialization. Their review proposed that, with the help of digital technologies, more open, collaborative, and fast innovation cycles become possible, enabling firms to respond to market opportunities more efficiently.

This mediation model is supported by empirical evidence from several studies. Surveying 412 companies in Europe, Elia et al. (2020) found that digitalization has greatly contributed to the growth of both product and process innovation, thereby enhancing competitive advantage. According to their structural equation modeling, innovation fully mediated the relationship between digitalization and competitive advantage, indicating that competitive advantage is mainly driven by the creation of innovation capabilities enabled by digital technologies.

Likewise, Beliaeva et al. (2020) studied innovation ecosystems in the digital world and reported that digitalization increased firms' potential to engage in and benefit from innovation networks. Their analysis of 278 technology companies revealed that digital tools helped share knowledge and collaborate with outsiders, accelerating innovation and ultimately enhancing competitive positioning.

The various forms of innovation as mediators have also been studied. In their study, Ortigueira-Sánchez et al. (2022) distinguished between technological and non-technological innovation and found that digitalization exerted a greater impact on technological innovation, yet both forms contributed to competitive advantage. Their analysis of Spanish manufacturing companies indicated that digital tools were especially effective in supporting product and process innovations, but not as effective in organizational and marketing innovations.

The benefits of innovation have also been addressed in terms of timing. A longitudinal study of digital transformation initiatives by Steininger (2019) revealed that some competitive advantages of digital transformation projects are realized within a very short period due to efficiency gains. In contrast, the benefits of innovation typically take longer to materialize. Their study recommended that companies must sustain digitalization initiatives over the long term to realize the benefits of innovation fully.

2.7.3 SME-Specific Considerations

The dynamics of digitalization, innovation, and competitive advantage have certain peculiarities in SMEs, and the topic has been the subject of numerous studies. A lack of resources is common among SMEs, which influences their policies and drives digitalization that yields trends different from those of larger organizations.

In their study, Ngugi and Karanja (2019) examined the Enterprise Digitalization of 215 African SMEs and determined the distinctive challenges and opportunities under resource-restrictive conditions. They discovered that SMEs tended to have more focused digitalization strategies and focused on customer-facing technologies that provided immediate competitive advantages. Digitally engaged SMEs, despite limited resources, demonstrated high innovation potential, especially in developing frugal innovations that met local market needs.

Digital ecosystems have been discussed as a way of aiding SME digitalization in various works. Sahut et al. (2021) investigated how SMEs overcame barriers to innovation by leveraging digital platforms and marketplaces, which provided access to tools, markets, and knowledge that would not have existed otherwise. They proposed in their study that the internal resource limitations of SMEs were partially addressed through engagement in digital ecosystems.

The flexibility of SMEs in digitalization has been identified as a competitive advantage in its own right. Comparing digital change within SMEs and large companies, Ahmed et al. (2017) indicated that digital transformation in SMEs was more common and faster because organizational structures were flatter and less bureaucracy impeded change. This dynamism helped SMEs to enjoy first-mover benefits in new digital markets. Nevertheless, another issue in digitalization for SMEs is a significant challenge. Brunetti et al. (2020) identified digital skills gaps as a critical limitation, and many SMEs lack the technical skills needed to adopt more advanced digital solutions. Their analysis of Italian SMEs revealed that a lack of skills frequently compelled them to adopt simpler digitalization approaches, with less impact on innovation and competitiveness.

The role of external assistance in surmounting these difficulties has been discussed in several studies. The study by Palmié et al. (2022) examined the role of government programs and industry associations in digitalizing SMEs through training, funding, and technical support. They proposed in their study that this assistance would be beneficial to the SMEs in the initial phases of digitalization.

2.7.4 Sectoral and Regional Variations

Correlations between digitization, innovation, and competitive advantage differ considerably across sectors and regions, as many studies show. Such differences indicate variations in technological needs, market structure, and institutions.

In the manufacturing sector, Modgil et al. (2022) studied the implementation of Industry 4.0 across 314 manufacturing companies and found that digitalization positively affected their competitive advantage, primarily through process innovation and supply chain integration. Their study also emphasized that manufacturing companies needed more advanced digital infrastructure than service companies, which meant they faced higher implementation barriers but also greater potential benefits. Omnichannel strategies and customer experience research have been applied in the retail sector, which has been extensively researched. The study by Kollmann et al. (2022) on digital transformation among retail SMEs found that the most effective way to leverage complementary online and offline retail operations is to gain a greater competitive advantage through customer experience and operational efficiency.

Geographical differences have also been significant. Comparisons of digitalization across countries have found significant disparities in adoption rates, implementation methods, and outcomes. For example, Aksoy (2023) compared the digitalization of European and Asian SMEs and found that Asian companies were more inclined to implement holistic digitalization strategies and were more challenged by compliance with data privacy and security regulations. A number of studies have highlighted the influence of the institutional environment on the outcomes of digitalization. Kyriakopoulos (2022) explored the role of regulatory systems, digital infrastructures, and educational systems in digital transformation in nations. Their study examined whether the relationship between digitalization and competitive advantage was stronger in countries with conducive digital ecosystems.

2.7.5 Methodological Approaches and Limitations

The reviewed empirical studies have adopted varying methodological approaches, each with specific advantages and weaknesses. The literature has been dominated by quantitative research, which uses surveys and secondary data to achieve large sample sizes and make statistical generalizations. Nevertheless, such studies usually fail to reflect the dynamic nature of digital transformation. Case research and other qualitative studies have provided detailed insights into the process of digitalization, but struggle with generalizability. For example, Wang et al. (2023) selected in-depth case studies of five SMEs' digital transformation. They identified subtle implementation processes and contextual influences that were difficult to trace using quantitative methods.

The mixed-methodology has proved to be a good trend, with the breadth of quantitative research and depth of qualitative inquiry. Aithal (2023) adopted a sequential explanatory design, which proved helpful for initially determining the statistical relationships between digitalization and competitive advantage and for subsequently examining the processes through qualitative research.

Another major weakness of the current literature is that the studies are mainly cross-sectional, incapable of establishing causality and the dynamic nature of digital transformation. Longitudinal studies are comparatively difficult to find, but they could be a valuable contribution to understanding the effect of digitalization on competitive advantage over time. One of the few longitudinal studies conducted by Bazadough (2024)

monitored the digital transformation of SMEs over three years and distinguished stages of digital maturity, each with varying levels of innovation and competitive performance.

2.7.6 Research Gaps and Future Directions

Although the number of studies on the relationship between digitalization, innovation, and competitive advantage is increasing, significant gaps remain. First, the mediating role of innovation is not disputed, but the exact mechanisms by which digitalization promotes various types of innovation should be further researched. There should be greater emphasis on the differences between technological and non-technological innovation, as well as on the association between incremental and radical innovation in the digital arena.

Second, the role of organizational capabilities in the digital transformation process needs to be more thoroughly investigated. Although digital skills have been recognized as significant, more general skills such as digital leadership, agile governance, and data culture have received less attention. Still, they could be key to converting digital investments into innovation and competitive advantage.

Third, the dynamic capabilities viewpoint presents an interesting theoretical framework for understanding digital transformation that has not been exploited in empirical studies. The ways in which firms create, integrate, and restructure digital capabilities to respond to rapidly changing environments are a significant point of inquiry.

Fourth, the dark aspects of digitalization have not received sufficient attention. Potential problems that conflict with the long-term innovation and competitive advantage include digital addiction, information overload, and technological dependency, regardless of the short-term benefits.

Fifth, the role of the digital ecosystem in facilitating SME digitalization warrants further investigation. Platforms and marketplaces have been identified as key enablers, but it is unclear how SMEs navigate these ecosystems and balance opportunities and dependencies.

Lastly, the sustainability implication of digitalization is a new field of focus. The contribution of digital transformation to environmental, social, and economic sustainability, as well as improvements in competitive advantage, warrants exploration.

This empirical research is based on a well-established correlation between enterprise digitalization and competitive advantage, with innovation as a mediating variable. The data indicates that digitalization increases competitive advantage mainly by enabling innovation and the development of high-value products. This connection is particularly relevant to SMEs, which can use digital technologies to overcome resource constraints and compete effectively in digital markets. Nevertheless, it is a complex, interdependent relationship that depends on various factors, such as an organization's industry background, regional setting, capacities, and digitalization strategy. Companies that engage in broad-based digitalization across multiple areas are likely to achieve more successful innovation outcomes and greater competitive advantage than those that pursue single initiatives.

The review also identifies several methodological weaknesses in the current literature and establishes significant research gaps. Future studies should use more longitudinal designs, combine different perspectives, and focus on the emergent challenges of sustainability and the dark side of digitalization. Filling these gaps will enable researchers to gain more specific insights into the role of digitalization in boosting innovation and competitive advantage, especially among SMEs. Such understanding can help practitioners develop more effective digital transformation plans that balance digital implementation and organizational change, resulting in sustainable competitive advantage in digital markets.

Chapter Three: Methodology

3.1 Introduction

This chapter describes the methodological framework for collecting, analyzing, and interpreting the data to achieve the study's objectives. The primary purpose of the chapter is to clarify the research method and support the choice of approaches used to investigate the associations among enterprise digitalization, innovation, and competitive advantage in SMEs. The chapter is also supposed to make the research process transparent, rigorous, and replicable.

3.2 Research Philosophy

The philosophy of research provides the basis for any scientific work and for how reality is perceived and knowledge is gained. Despite the variety of research philosophies, the philosophy chosen for this study is positivism, which is most suitable for the objectives and topic of this research. (Saunders, Lewis, & Thornhill, 2019).

Ontological Perspective (Nature of Reality): Positivism rests on the belief that reality is objective and homogeneous, and that the phenomena under scrutiny exist independently of the investigator and of people's perceptions. Based on this, the research paper assumes that the correlation between digital transformation, innovation, and competitive advantage among small and medium-sized enterprises (SMEs) is observable and measurable, regardless of how individual managers interpret or perceive it. (Bryman & Bell, 2015)

Epistemological Perspective (Nature of Knowledge): According to positivism, valid knowledge can be obtained through observation, proper measurement, and testing whether it is true or not. In this case, the research will rely on a quantitative approach directly aligned with the study's objective of examining the impact of enterprise digitalization on the competitive advantage of small and medium-sized enterprises (SMEs), and the mediating role of innovation. This approach enables the researcher to test hypotheses through statistical analysis, thereby allowing for objective measurement of the relationships among digitalization, innovation, and competitive advantage. Such a method ensures that the results are not only accurate but also generalizable to similar SMEs operating in comparable contexts (Collis & Hussey, 2014).

In line with the objective of this study, which seeks to examine the impact of enterprise digitalization on the competitive advantage of small and medium-sized enterprises (SMEs) and the mediating role of innovation, a quantitative research design was adopted. A questionnaire was used to collect data from SMEs in a consistent, standardized manner, ensuring the objective measurement of key elements of digitalization, innovation, and competitive advantage.

The relationships between these variables will be tested using appropriate statistical methods, enhancing the reliability of the results and promoting their reproducibility and validity in future studies (Saunders et al., 2019). A positivist philosophy will enable this study to achieve the highest level of objectivity and scientific rigor. It also ensures that the outcomes are based on quantifiable, verifiable objective facts, making them more acceptable in the SME context during digitalization. (Bryman & Bell, 2015).

3.3 Research Approach

The research methodology to be used depends on the type of phenomenon under investigation, the research questions, and the hypothesis to be tested. A deductive approach was adopted in this study, as the research seeks to analyze the correlation among digital transformation, innovation, and competitive advantage in small and medium-sized enterprises (SMEs). This methodology is based on theoretical backgrounds and prior research to develop hypotheses, and then gathers and statistically evaluates data to test the hypotheses. Thus, the study in this case is a test of theory acquisition rather than its building, which is the peculiar feature of the deductive method. Various core theories are used to aid in the interpretation of the correlation between digital transformation, innovation, and the competitive advantage of SMEs:

Resource-Based View (RBV): According to this theory, firms can gain a sustainable competitive advantage by exploiting unique resources and capabilities. Digital technologies have been viewed as strategic resources that can be used to support a firm's innovation and competitive position in our research (Barney, 1991).

Diffusion of Innovation Theory: It is a theory that focuses on the diffusion and adoption of innovations within an organization. It corroborates the study's concept of innovation as an intermediary between digital transformation and competitive advantage,

demonstrating the relevance of embracing technology to enhance a firm's performance (Rogers, 2003).

Dynamic Capabilities Theory: This theory is based on the firm's capacity to combine, develop, and restructure its internal and external capabilities to respond to rapid environmental changes. It helps understand how SMEs can embrace digital transformation to adapt and maintain a competitive edge (Teece, Pisano, and Shuen, 1997).

The methodology of this study was quantitative, as the research objectives align with it. In this way, the core variables, which are digital transformation, innovation, and competitive advantage, can be measured on a standard and analyzed with statistical instruments. This delivers valid and generalizable findings that can assist SMEs in understanding the impact of digitalization and innovation on their competitive advantage (Bryman and Bell, 2015; Creswell and Creswell, 2018).

Conversely, qualitative research involves interviews, observation, or case studies to gain a more in-depth insight into people's experiences and social contexts (Creswell and Creswell, 2018; Saunders, Lewis, and Thornhill, 2019). Although these methods are applicable in certain regions, they were not applied in this study because the aim is not to examine individual views but to test the relationship between variables statistically.

By using a **deductive approach** together with a quantitative method, this study follows a positivist philosophy. This ensures that measurements are objective, results are accurate, and findings can be replicated in future research (Collis & Hussey, 2014; Bryman & Bell, 2015).

3.4 Research Strategy:

Consistent with the aims of this study, which focus on the effect of enterprise digitalization on competition advantage among SMEs and the role of innovation as a mediating factor, the survey strategy was selected as the most suitable method for data collection. Saunders et al. (2019) noted that the survey is a research strategy that allows the researcher to collect standardized information on a relatively large scale, which is appropriate for research aimed at determining patterns, quantifying relationships between variables, and improving generalizability. The use of a survey strategy will enable the

researcher to systematically gather the perceptions of SME managers regarding the degree of digitalization in their organizations, the level of involvement in innovation activities, and the potential competitive advantage. The strategy is also the most suitable for this research, as it provides the depth to examine research trends across a wide range of SMEs, something that qualitative research approaches, which focus more on depth than coverage, cannot do.

In this plan, the questionnaire served as the primary data-gathering instrument, as it was designed to yield quantifiable, comparable, and structured responses. The questionnaire items were constructed based on existing measurement scales to ensure consistency and allow the study's hypotheses to be tested statistically. This form of structure enables the aim of finding the connections between digitalization, innovation, and competitive advantage, as well as ensuring the replicability and reliability of the results (Bryman and Bell, 2015; Creswell and Creswell, 2018).

3.5 Methods of Data Collection

In scientific research, data collection typically involves two types of data: primary and secondary. Primary data are information gathered directly from the study's objects for the study's specific purpose, using tools such as questionnaires. Secondary data are information that has already been gathered and published by other authors or organizations, including academic articles, books, reports, and statistical databases. These materials assist the researcher in developing the theoretical framework, understanding past discoveries, and developing the instruments for the study.

3.5.1 Primary Source

The structured questionnaire was the primary data collection instrument in this study because it is one of the most prevalent instruments in quantitative research, enabling the collection of standardized evidence analyzed using statistics (Saunders et al., 2019; Creswell and Creswell, 2018). The questionnaire was well-crafted to meet the research objectives, questions, and hypotheses. The questionnaire consists of three main sections: Demographic data, Enterprise Digitalization and Innovation, and Competitive Advantage

The study variables were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), as it is one of the most suitable scales for quantitatively measuring attitudes and perceptions accurately (Bryman, 2016).

The executives and department managers of small and medium-sized enterprises (SMEs) were the recipients of the questionnaire, as they are considered the most informed about the current state of digital transformation and the degree of innovation and competitiveness within their companies. Confidentiality was guaranteed, and the information was used solely for research; as a result, the quality of responses was high.

3.6 Questionnaire

A questionnaire was developed to assess digital transformation, innovation, and competitive advantage among SMEs. The responses were based on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), and these measures provided clear, precise responses (Bryman, 2016; Creswell and Creswell, 2018).

As many people use digital technologies in SMEs, and it is easy to reach participants, the survey was disseminated electronically via tested online sources. The approach is viable and convenient, as it allows participants to complete surveys when they feel at liberty, thereby improving response rates and minimizing errors associated with manual data entry (Evans & Mathur, 2005; Saunders et al., 2019). Furthermore, electronic distribution aligns with the study's theme of digital transformation, as SMEs are increasingly dependent on digital tools in their operations. The use of paper-based questionnaires was avoided because they were more expensive and logistically challenging to distribute to organizations in different areas (Dillman, Smyth, and Christian, 2014).

3.6.1 Questionnaire Structure

The questionnaire consisted of several sections:

Personal Information: Basic data on nationality, years of experience, job title, organization size, and sector.

Enterprise Digitalization: Questions to assess the extent of digital technology use and digital strategies in operations. Key dimensions included:

- E-business Optimization
- Data-driven Decision Making
- Social Media Engagement
- Cloud-Based Collaboration
- Personalized Marketing with AI

Innovation: Items measuring the level of innovation applied to operations and services.

Competitive Advantage: Questions evaluating how digitalization and innovation contribute to the organization's market competitiveness.

This structure ensures that the questionnaire effectively captures all aspects of the study variables and supports the quantitative analysis of their relationships.

3.6.2 Advantages of the Survey

- The remaining numerical measures enable precise analysis of the collected data.
- The survey collects information from numerous participants over brief time intervals, thus enabling more robust indirect results.
- Through its surveys, participants can provide answers based on their circumstances.

3.7 Population and Study Sample

3.7.1 Unit of Analysis

The unit of analysis in this research paper is the small- and medium-sized enterprise (SME) based in the West Bank, Palestine. An enterprise is a specialized analytical unit

for studying the relationships among digital transformation, innovation, and competitive advantage.

3.7.2 Population

The sample comprises all SMEs in the West Bank that embrace digital transformation and view innovation as an essential component of business strategy. These are businesses that operate across industries such as information technology, e-commerce, manufacturing, and financial services. The 2022 report of the Palestinian Ministry of National Economy lists 698 SMEs considered active in digital and innovative activities (Palestinian Ministry of National Economy, 2022).

3.7.3 Target Population

The target population will be the SMEs in the West Bank that fit the following criteria:

- Officially registered by the Palestinian Ministry of National Economy.
- Fulfill the requirements of the International Labour Organization (ILO) definition of SMEs (≤ 250 employees).
- Digital change and innovation have become a component of their competition strategy.

3.7.4 Sampling Frame

There are two major approaches that one can use before choosing a sampling method, and these include:

- Probability sampling where there is an equal probability of selection of all members of the population.
- Non-probability sampling is a sampling method in which participants are selected according to a criterion, such as availability or importance (Saunders et al., 2019).

Since there is no comprehensive database of all digital SMEs in the West Bank, purposive sampling, a non-probability sampling strategy, was used. With this approach, the researcher was able to narrow the list of SMEs that met the study requirements (digital operations, ≤ 250 employees, innovative), and the information obtained will be relevant and meaningful to the study's purpose (Etikan, Musa, and Alkassim, 2016).

The sample size was calculated in accordance with the needs of Partial Least Squares Structural Equation Modeling (PLS-SEM) based on the official population size (698 SMEs). Two hundred and fifty valid answers were approached, which is 10 times the highest number of independent variables (Hair et al., 2019). To account for non-response, 300 questionnaires were sent to the designated companies. This design will provide sufficient population coverage and yield results that can be generalized to SMEs in the West Bank.

3.7.5 Key Informants

To obtain accurate, informative data, key informants were selected from senior and executive managers of each SME. These include general managers, department heads, and those who design and implement digital transformation initiatives. They were selected because they possess the highest level of understanding of the company's digital strategies, innovation practices, and competitive positioning. Their contribution will be to ensure that responses are based on the organization's actual practice and capability, not on the personal perceptions of lower-level employees.

3.8 Measurement

The main variables in the research were identified based on academic reviews of previous studies. The following table shows the references associated with each variable in the study

Table 3.1: Sources of variables and questionnaire items.

variable	Questionnaire items
Independent variables (Enterprise digitalization)	
1. Business Optimization <i>Source: Bazadough, S. J. (2024)</i>	
	1. The enterprise allocates special expenses for digital services.
	2. The enterprise updates the digital services budget.
	3. The enterprise handles digital emergency expenses in the event of a financial disruption.
	4. Social media reduces the cost of marketing communications.
	5. Social media is cost-effective compared to traditional media and serves as a medium for public education.
2. Data-driven Decision Making. <i>Source: Fattah, I. A., & Arief, M. (2023)</i>	
	6. Data and analytics usage have improved decision-making.
	7. The use of data and analytics affects the reliability of our organization.
	8. Data and analytics usage in our organization is error-free
	9. Our organization has gained strategic advantages because decision-making time is fast.
	10. Our organization has a fast decision-making process.
3.Social Media Engagement <i>Source: Saputra, M. H., Utomo, M. N., Ariansyah, K., Wismayanti, Y. F., & Ansyah, R. H. A. (2024)</i>	
	11. Using digital marketing techniques to gain a larger share of customers
	12. Providing online payment services (including money transfers) to facilitate customer transactions
	13. Improving the company’s online profile to facilitate recognition of the company’s content by online search engines
	14. A company using social media helps attract new, informed customers.
	15. Social media helps customers challenge companies to innovate
4. Cloud-Based Collaboration. <i>Source: Xu, J., Zhai, J., Li, F. E., & Lv, X. (2020)</i>	
	16. Organize and Manage All Aspects of Supply Chain Planning
	17. Scheduling and Monitoring Production System and Virtualizing Manufacturing Resources
	18. Establishing Communications and Information Exchange between Production Resources
	19. Using Simulation and Modeling Technologies in Production Processes
	20. Diagnosing Faults and Performing Effective Maintenance
5. Personalized Marketing with AI <i>Source: Al Koliby, I. S., Mehat, N. A. B., Al-Swidi, A. K., & Al-Hakimi, M. A. (2024) & Amoah, J., Bruce, E., Shurong, Z., Bankuoru Egala, S., & Kwarteng, K. (2023)</i>	
	21. The company recognizes it can innovate in its digital business methods.
	22. The company provides customer requests and needs in the digital market faster than its competitors.
	23. The company can link its digital channels to broader, easier-to-use orbits for customers than its competitors.
	24. Social media helps us monitor our competitors' marketing activities.
	25. Social media helps enhance the reputation of brands and companies.
Mediate variable: Innovation <i>Source: Shehadeh, M., Almohtaseb, A., Aldehayyat, J., & Abu-ALSondos, I. A. (2023) & Mansouri, R. (2022)</i>	
	1. The facility generates new service ideas on an ongoing basis.
	2. The facility is constantly looking for new ways to innovate in work methods.
	3. The facility can provide new products/services every 5 years.
	4. The facility’s R&D and digital services capabilities are better than those of its competitors.
	5. The facility is continually improving the services it provides to customers.
	6. The facility provides an environment that encourages employees to apply innovative and renewed work methods.
	7. The facility has modern idea development centers in the field of service provision.
	8. The facility offers additional services with innovative features not found in competitors.
Dependent variable : Competitive Advantage <i>Source: Bazadough, S. J. (2024)</i>	
	1. The enterprise adheres to the budget allocated to cover the cost of digital services.
	2. The enterprise monitors the disbursement of digital service costs.

variable	Questionnaire items
3.	The enterprise determines the cost of training employees on digital services as a proportion of total costs.
4.	The enterprise fosters a culture of high-quality digital services.
5.	The enterprise improves the quality of its services based on feedback.
6.	The enterprise monitors the development of quality levels through a periodic reporting system.
7.	The enterprise allocates financial support to stimulate the highest quality standards.
8.	The enterprise can adapt and reallocate its resources.
9.	The enterprise can exploit all market opportunities.
10.	The enterprise has a strategic plan to keep pace with developments in the external environment.
11.	The enterprise exploits more market opportunities than its competitors.

3.8.1 Instrument Reliability

The survey was designed to provide accuracy, in addition to reliability and validity. The pre-test of the questionnaire helped researchers ensure it was easy to understand and relevant to the situation being investigated. The experimental phase was conducted during the pre-study period, using SMEs to assess the validity and reliability of the collected data. The questionnaire served as the primary data collection tool for this study, yielding outstanding results and achieving the study's objectives. This approach is what gives the research credibility and validity in establishing alignment of digital enterprise and SME engagement.

The data from the research participants yielded scientific findings and an evaluation of employees' opinions on the use of enterprise digitalization in small and medium-sized enterprises (SMEs) in the Western Region. All statements were measured on a five-point Likert scale (ranging from strong disagreement at one end to strong agreement at the other, with a middle range of strong disagreement to strong agreement). This scale is used to analyse quantitative results obtained from this measurement.

The item satisfaction levels of survey participants were measured using three levels of low, medium, and high with respect to the following equations:

$$\text{Class Length} = \frac{(\text{Upper Limit of Alternatives}) - (\text{Lower Limit of Alternatives})}{\text{Number of Levels}}$$

$$\frac{(5 - 1)}{3} = 1.33$$

Based on the calculated class length, the boundaries for the three levels are determined as follows:

Table 3.2: Level Degree.

Arithmetic Mean	Degree Of Agreement
From 1.00 – 2.33	Low
From 2.34-3.67	Medium
From 3.67-5.00	High

Research Ethics

The researcher conducted this research in accordance with all known ethical principles in scientific research. Prior to administering the questionnaire, informed consent was obtained from all participants. They were told that it was purely voluntary and that the information gathered would not be used for any purpose other than scientific research.

Anonymity and confidence were also stressed, as no individual information was sought that would expose participants' identities or the institution where they are employed. Respect was also taken into consideration by assuring participants that they were free to drop out of the study without any form of punishment, which respected their rights and choice to take part.

Moreover, the participants were advised to be transparent and honest, to share their answers, and to provide accurate information, as this would help improve the quality and credibility of the findings.

Such practices demonstrate ultimate adherence to the ethics of scientific research and a responsible, impartial appreciation of participants' roles in the study's success and in achieving its goals.

3.9 Validity and Reliability of the Study

3.9.1 Validity Test

The validity of the research-based questionnaire tool needed to be tested in detail because such testing is an essential aspect of studies that rely on data. The study involved tests to assess the questionnaire's validity regarding the relationship between enterprise digitalization and competitive advantage in SMEs, with innovation as a mediator. The research made efforts to ensure that the questionnaire appropriately measured all concepts with respect to its research objectives.

3.9.2 Content Validity

The survey questions were well-constructed to encompass all the dimensions and concepts related to digital transformation, innovation, and competitive advantage, in line with the principles of content validity in research (Creswell and Creswell, 2018; Saunders et al., 2019). The survey was introduced to five academic professionals working on digital transformation and innovation (names will be provided in the appendix) to ensure the questions are clear and relevant to the study's goals. A number of digital company managers were also invited to review the instrument and ensure it was relevant to real-life business situations.

Those comments were crucial in refining survey questions, as some were revised to improve understanding, conceptual accuracy, and relevance to the current context. These changes made the research tool clear and enabled it to assess the mediating effect of innovation in the relationship between digital transformation and competitive advantage in SMEs. It is regarded as one of the steps in the pre-testing of the tool, designed to assess the questionnaire's validity and reliability and to provide the tool to the main sample, thereby justifying the accuracy and authenticity of the results (Hair et al., 2019).

3.9.3 Reliability

A sound questionnaire instrument must have reliability, which is a crucial measurement component of a tool effectiveness test. Reliability of a tool is a product of its ability to yield consistent results across the population or the same test subjects. The research used Cronbach's alpha to assess data reliability, using institutional data on small and medium-sized enterprises (SMEs). The Lancashire researchers commonly use Cronbach's alpha as a research instrument. The statistical reliability measures indicate a high level of reliability, with values greater than 0.60, as established by Sekaran and Bougie (2016). The higher the alpha value, approaching 1, the greater the tool's reliability, since it indicates that the questionnaire questions describe valid criteria. The design was obtained in SPSS to calculate Cronbach's alpha, which was used to determine the data in the following table.

Table 3.3: Cronbach's Alpha Values for Study Variables.

Variable	Cronbach's Alpha	No. Of Items
Independent variable: Strategic Enterprise digitalization	0.904	30
E-business Optimization	0.876	8
Data-driven Decision Making	0.879	5
Social Media Engagement	0.862	6
Cloud-Based Collaboration	0.846	5
Personalized Marketing with AI	0.862	6
Mediate Variable: Innovation	0.936	8
Dependent variable: Competitive Advantage	0.907	13

The Cronbach's alpha coefficient results in Table 3.3 indicate that the instrument used in this study has a good level of reliability, with coefficient values ranging from 0.846 to 0.937 for all variables. This indicates that the instrument provides reliable, consistent measurements, thereby enhancing its ability to assess variables accurately. The high alpha values (>.6) indicate that the survey questions perform well and contribute to achieving reliable results for studying the relationship between Business digitalization and competitive advantage in SMEs.

3.10 Methods of Data Analysis

In the research, which aims to examine the influence of Business digitalization on competitive advantage in small and medium-sized enterprises (SMEs) with the mediating effect of innovation, various statistical tools will be used to analyze the data and test the hypotheses. The statistical techniques to be employed by this research include:

- Descriptive analysis: This analysis is applied to describe the nature of the sample and data obtained. This involves means, standard deviations, and percentages to provide an overview of the collected data, e.g., the distribution of participants across personal variables such as gender, years of experience, and organization size.
- Pearson Cronbach's Alpha Correlation Analysis
- VIF (Variance Inflation Factor) and Tolerance tests to identify multicollinearity among independent variables, and to determine significant variable interdependence to maintain statistical analysis accuracy.

- Statistical data analysis will be conducted using SmartPLS software to calculate Cronbach's Alpha to evaluate the instrument's internal consistency, test correlational and regression relations, and perform mediation analysis. The software is based on structural equation modelling (PLS-SEM), which permits the estimation of associations among variables in complex models that take into account both direct and indirect effects, as well as mediating effects.

PLS-SEM was preferred over variance-based structural equation modeling (CB-SEM) for several methodological reasons, as supported by the literature. To begin with, PLS-SEM is well-suited to models that entail more than one variable and complex dimensions, as in this study, which involves digital transformation, innovation, and competitive advantage, with innovation as an intermediate variable (Hair et al., 2019). Second, with PLS-SEM, it is possible to use comparatively smaller samples than with CB-SEM while preserving the accuracy of approximations, based on data from small and medium-sized enterprises (SMEs) (Hair et al., 2017). Third, PLS-SEM is very flexible regarding data distribution, as it does not presuppose that variables are normally distributed. It is therefore applicable to real-world data in the business environment (Sarstedt et al., 2014).

Based on this, the application of SmartPLS and PLS-SEM enables rigorous analysis of the variables, including internal consistency, causal relationships, and mediation analysis. It ensures that the results are reliable and can explain the complex effects in the study model.

Conclusion

Using a variety of statistical measures, this study aims to provide a detailed and precise examination of the relationship between digital Business and competitive advantage in small and medium-sized enterprises (SMEs), with innovation as a mediating variable. The validity and accuracy of the results are improved by using descriptive analysis, internal consistency tests, multicollinearity analysis, and SmartPLS to analyze causal relationships. It is through this combination of methodological and analytical approaches that the researcher is confident that clear, scientifically based findings will be achieved, helping to provide deeper insight into the influence of innovation and digitalization on competitive advantage in the current business environment.

Chapter Four: Result

4.1 Introduction

This chapter presents the results of the statistical tests performed in SPSS and **Smart PLS 4.0**. These results include the sample's features and significant correlations among the dependent variable, mediating variables, and independent variables. The following statistical results play an essential role in determining the Impact of Enterprise Digitalization and Competitive Advantage in SMEs: The Mediating Role of Innovation, the relevant research questions, and the hypotheses are answered and tested, respectively.

4.2 Statistical Outcomes on the Demographic Data of the Study Sample

This part includes a descriptive analysis of the frequencies and percentages of the respondents' demographic characteristics, as gathered in the first section of the questionnaire. These attributes, such as gender, age, education level, experience, job description, organization size, and industry type, are not just simple descriptive statistics; they play an essential role in making sense of the results. A demographic analysis of the profile can be used to evaluate the sample's representativeness, identify potential biases, and provide a more nuanced explanation of how these background variables will affect perceptions and practices regarding Enterprise Digitalization, Innovation, and Competitive Advantage. The tabulation of the sample responses is presented in Tables 4.1-4.5.

Gender Distribution of the Sample

The study's sample is distributed by gender, as shown in Table 4.1. The findings indicate that 252 participants were included: 76 (30.2) were female, and a large majority, 176 (69.8), were male.

Table 4.1: Distribution of Participants by Gender.

Gender	Frequency	Percent
Female	76	30.2%
Male	176	69.8%
Total	252	100%

Such a gender distribution, with a significant majority of males, warrants consideration. Although it is a general reality in most business leadership settings worldwide, it is more exaggerated in some areas and sectors. In the Palestinian business

environment, such an imbalance could reflect the corporate setting in which men are over-represented in top management and ownership positions. This is a demographic fact that may affect the study's findings. Gender-based experiences and social conventions occasionally shape views on risk-taking, technology adoption, and strategic innovativeness. As a result, the perceptions obtained in this study might be biased towards the majority of male leaders' attitudes and strategic perspectives. This should be noted as one possible constraint, and the experiences of female leaders, who might introduce alternative, innovative methods and digital strategies, might be underrepresented. Further studies may strategically sample the population to achieve a better balance in gender representation and investigate these differences more directly.

Experience and Seniority of Respondents

Respondents' professional experience is a vital variable because it can be related to their strategic outlook and willingness to change. The sample size in the study, by years of experience, is shown in Table 4.2. The findings show that the largest proportion (50.8%, or 128 participants) reported having over 10 years of experience. This is preceded by 48 participants (19%) with less than 3 years of experience, 40 participants (15.9%) with 6 to 9 years of experience, and 36 participants (14.3%) with 3 to 5 years of experience.

Table 4.2: Distribution of Participants by Years of Experience.

Years of Experience	Frequency	Percent
Less than 3 years	48	19.0%
From 3 to 5 years	36	14.3%
From 6 to 9 years	40	15.9%
More than 10 years	128	50.8%
Total	252	100%

It is also crucial that over half of the respondents have more than a decade of professional experience. This implies that the sample consists of many experienced professionals, who are probably in senior roles and have a profound knowledge of their respective fields of operation and how their competitive environment has changed. They have extensive experience, so that experience and history inform the answers they provide. They have seen the shift from pre-digital to digital business models and can offer valuable insights into the long-term effects of Enterprise Digitalization. This rich experience, on the other hand, might also be linked to possible resistance to radical change

or a less aggressive attitude toward adopting disruptive technologies. Conversely, the noteworthy but smaller number of respondents with less than three years of experience could be a more digitally native generation and, therefore, less savvy and less hype-driven about innovation. The interaction between these experienced and less experienced groups in the data may be an interesting area for generational or experience gaps in understanding the role of digitalization in creating competitive advantage.

The meaning of this level of experience is further contextualized by the Job title distribution, presented in Table 4.3. The respondents are skewed toward strategic and managerial positions, with 72 (28.6%) participants being General Managers, 44 (17.5%) Executive Directors, and 36 (14.3%) Department Managers. These senior positions together represent 60.4% of the sample. The other respondents are administrative officers (52, 20.6%) and Technical Employees (48, 19%).

Table 4.3: Distribution of Participants by Job Title.

Job Title	Frequency	Percent
Executive Director	44	17.5%
General Manager	72	28.6%
Department manager	36	14.3%
Administrative Officer	52	20.6%
Technical employee	48	19.0%
Total	252	100%

This is a strength of the study, as it relates to distributions; having a majority of senior management in the firm means responses will take a strategic and organization-wide perspective rather than strictly operational or departmental viewpoints. These are the people who determine the digital agenda, resource allocation, and competitors' performance measurement. Their perspectives can thus be invaluable for insights into the relationships between digitalization, innovation, and strategy. The incorporation of Administrative Officers and Technical Employees, though, adds significant depth, offering insights into the ground-level engagement in the real-world implementation of digitalization efforts and their challenges.

Organizational Size and Sectoral Analysis

The magnitude and industry of respondents' organizations are primary factors that determine their online activities. Table 4.4 presents the distribution by organization size. The findings have shown a bimodal distribution, with the highest number of organizations constituting a “Very Small” organization (less than 10 employees) of 80 (31.7%), and the second group is the “Large” organization (250 or more employees) of 68 (27%). The sample also includes 56 medium-sized (22.2%) and 48 small (19%) organizations.

Table 4.4: Distribution of Participants by Size of Organization.

Size of Organization	Frequency	Percent
Very small (less than 10)	80	31.7%
Small (10 to 49)	48	19.0%
Medium (50 to 249)	56	22.2%
Large (250 or more)	68	27.0%
Total	252	100%

It is an interesting distribution. The large proportion of both "Very Small" and "Large" firms offers a unique opportunity to compare and contrast their experiences with digitalization. Very small SMEs are often constrained by very limited resources and can use agility and low-cost digital tools to compete. Their journey to digitalization as a competitive edge is probably one of frugality in innovation and parsimonious operations. Large organizations, conversely, face other obstacles, such as disrupting internal bureaucracy, integrating multifaceted legacy systems, and managing change across a larger group of people. They may have more organized and planned digitalization, but it might be slower. These two groups of findings will have to be considered through these different lenses.

Lastly, Table 4.5 shows the distribution of participants' industries of employment. The findings show that the concentration is high in the "Technology and Software" sector, with 108 participants (42.9%). This is followed by “Other” sectors (56, 22.2%), “Industry and Manufacturing” sectors (52, 20.6%), and very small proportions for E-commerce sectors, Retail sectors, Financial Services sectors, Fintech sectors, and Logistics sectors.

Table 4.5: Distribution of Participants by Sector.

Sector	Frequency	Percent
Technology and software	108	42.9%
Other	56	22.2%
Industry and manufacturing	52	20.6%
E-commerce	12	4.8%
Retail and consumer goods	8	3.2%
Financial services	8	3.2%
Financial services and financial technology (Fintech)	4	1.6%
Logistics and supply chain	4	1.6%
Total	252	100%

The overwhelming prevalence of the Technology and Software industry is the most acute demographic feature of this sample and should be acknowledged as a predisposing factor. Such an industry is digital by nature; enterprise digitalization is not an option but a part of their business model for these companies. As a result, their digital adoption rates, culture of innovation, and perceived relationship between digitalization and competitive advantage are bound to be much higher than in more traditional industries such as manufacturing or retail. This raises the possibility of sampling bias, which limits the applicability of the study's findings to the entire population of Palestinian SMEs. The findings can be misleading about how digitalization is affecting things.

Nevertheless, this specialization is an opportunity as well. The research can offer a profound, in-depth understanding of the digital ecosystem in Palestine's most developed industry and can serve as a template for other industries. This sectoral concentration should be remembered when interpreting the results in the context of the test of hypotheses as one of the main contextual factors.

4.3 Descriptive Analysis of the Study Data

The researcher adopted the five-point Likert scale in the questionnaire to give more flexibility to the individuals in their choice, as the value ranged between (1-5) Likert scale was processed according to the following equation (Sekaran & Bougie, 2016).

$$CL = \left(\frac{S_{Max} - S_{Min}}{N_L} \right) \quad (4.1)$$

where CL is the category length, S_{Max} is the maximum substitute, and S_{Min} indicates the minimum substitute.

$$CL = \left(\frac{5 - 1}{3}\right) = 1.33$$

Relying on this value, Table 4.6 illustrates the degrees of agreement.

Table 4.6: The degrees of agreement and their corresponding value in the survey.

No.	Level of Agreement	Corresponding Value
1	First Degree of Agreement (Lower Level)	1.00 to 2.33
2	Second Degree of Agreement (Intermediate Level)	2.34 to 3.66
3	Third Degree of Agreement (High Level)	3.67 to 5.00

4.3.1 The Descriptive Statistics for the Independent Variables (Enterprise digitalization)

To accurately display the search results, the mean and standard deviation of each variable were calculated. For instance, Table 4.7 expresses the mean, standard deviation, order, and importance of **Enterprise digitalization**.

Table 4.7: The mean, Standard Deviation, rank, and Importance of Enterprise digitalization.

Items	Mean	SD	rank	importance
1. We are well aware of the possibilities and advantages of digitalization	4.191	0.733	1	High
2. We allocate significant resources to digitize the business	3.921	0.843	5	High
3. The business model is evaluated and updated in terms of digitalization	3.794	0.821	6	High
4. Our employees are prepared for the digital development of the company	4.143	0.796	2	High
5. Our managers are well-trained in digitalization	3.698	1.081	7	High
6. The degree of process automation is high in my company	3.952	0.882	3	High
7. We use digitalization in the organizational management of the company	3.937	0.872	4	High
8. Our company regularly organizes training for digital transformation	3.397	1.079	8	Medium
E-business optimization	3.879	0.656		High
1. Our organization relies on data and analytics when making important decisions.	4.000	0.856	4	High
2. We systematically use data and analytical tools to guide our strategic planning.	4.048	0.826	2	High
3. Data insights are regularly used in our daily operational decisions.	4.032	0.798	3	High
4. Our management encourages decisions based on data rather than intuition.	4.175	0.657	1	High

Items	Mean	SD	rank	importance
5. Employees have access to data tools and are trained to use them in decision-making.	3.968	0.818	5	High
Data-driven decision making	4.044	0.652		High
1. Our social media platform offers interactive communication with customers.	3.794	0.878	5	High
2. We are able to engage with customers through mentions and responses with controlled content messages.	3.937	0.733	1	High
3. Our social media platforms save time and effort in marketing, brand building, and customer service.	3.794	0.859	5	High
4. Infrastructure Compatibility	3.857	0.615	3	High
5. The social media platforms we have chosen are compatible with our existing IT infrastructure.	3.873	0.656	2	High
6. We use them to communicate the company's brand online.	3.810	0.733	4	High
social media engagement	3.844	0.578		High
1. Our organization uses cloud-based platforms (e.g., Google Workspace, Microsoft Teams) to share files and collaborate in real time.	3.968	1.009	4	High
2. Our organization relies on cloud tools to enable teamwork across departments regardless of physical location.	4.016	1.018	3	High
3. Our organization uses shared cloud calendars, documents, and task boards to coordinate project work.	4.048	0.935	1	High
4. Our organization uses cloud-based communication tools (e.g., Slack, Teams) to ensure continuous interaction among employees.	3.873	1.064	5	High
5. Our organization stores and accesses critical business data through secure cloud systems to support team productivity.	4.032	0.994	2	High
Cloud-Based Collaboration	3.987	0.912		High
1. Our overall marketing strategies have improved ever since we adopted marketing AI.	3.349	0.913	6	Medium
2. The company can now easily understand and segment its target audience due to the increased use of marketing AI.	3.524	0.942	3	Medium
3. The effectiveness and efficiency of the company's marketing campaigns increased significantly because of the company's adoption of marketing AI.	3.540	0.871	2	Medium
4. Our company has observed a substantial positive impact on customer engagement and satisfaction following the adoption of marketing AI.	3.508	0.835	4	Medium
5. Marketing AI improved the company's ability to analyze and use data for decision-making purposes.	3.603	0.829	1	Medium
6. The company observed huge improvements in its financial performance following the incorporation of marketing AI in its marketing activities.	3.492	0.872	5	Medium
Personalized Marketing with AI	3.503	0.804		Medium

In Table 4.7, the analysis of the study items shows variations in respondents' perceptions across different scales. For Enterprise Digitalization, the scale mean was 3.879 with an SD of 0.656. The highest mean score was 4.191 for the item "We are well aware of the possibilities and advantages of digitalization," while the lowest mean was 3.397 for "Our company regularly organizes training for digital transformation." In Data-Driven Decision Making, the scale mean was 4.044 with an SD of 0.652.

The maximum mean was 4.175 for "Our management encourages decisions based on data rather than intuition," and the minimum mean was 3.968 for "Employees have access to data tools and are trained to use them in decision-making." For Social Media Engagement, the scale average was 3.844, and the SD was 0.578. The maximum mean of 3.937 was in the case of "We are able to interact with customers using messages of controlled content", mentions, and responses. The minimum mean of 3.794 was observed for "Our social media platform provides us with time and effort saving engagement with customers" and "Our social media platforms".

In the Cloud-Based Collaboration case, the scale mean was 3.987, and the SD was 0.912. The maximum mean was 4.048 for "Our organization uses shared cloud calendars, documents, and task boards to coordinate project work." The minimum mean was 3.873 for "Our organization uses cloud-based communication tools to ensure continuous interaction among employees." Finally, in Personalized Marketing with AI, the scale mean was 3.503 with an SD of 0.804. The highest mean of 3.603 was for "Marketing AI improved the company's ability to analyze and use data for decision-making purposes." The lowest mean of 3.349 was for "Our overall marketing strategies improved ever since we adopted marketing AI." Overall, the findings indicate a generally high perception across all scales, with some variation in emphasis on specific items.

4.3.2 The Descriptive Statistics for the Dependent Variable (Competitive Advantage)

To accurately display the search results, the mean and standard deviation of each variable were calculated. For instance, Table 4.8 expresses the mean, standard deviation, order, and importance of **Competitive Advantage**.

Table 4.8: The mean, Standard Deviation, Order, and Importance of Competitive Advantage.

Items	Mean	SD	rank	importance
1. The enterprise adheres to the budget allocated to cover the cost of digital services	3.730	0.782	12	High
2. The enterprise monitors the disbursement of the cost of digital services	3.905	0.832	10	High
3. The enterprise determines the cost of training employees on digital	3.460	0.834	13	High
4. The enterprise is responsible for cost planning	3.937	0.796	7	High
5. The enterprise encourages employees to control costs through continuous development processes	3.921	0.743	8	High
6. The enterprise spreads a culture of high-quality digital services it provides	3.921	0.824	9	High
7. The enterprise improves the quality of its services based on feedback	4.175	0.606	1	High
8. The enterprise monitors the development of quality levels through a periodic reporting system	3.952	0.724	6	High
9. The enterprise allocates financial support to stimulate the highest quality standards	4.064	0.816	4	High
10. The enterprise has the ability to adapt and reallocate the use of its resources	4.143	0.665	3	High
11. The enterprise has the ability to exploit all opportunities in the market	3.889	0.694	11	High
12. The enterprise has a strategic plan aimed at keeping pace with developments in the external environment	4.175	0.681	2	High
13. The enterprise exploits a greater number of market opportunities compared to its competitors	4.032	0.713	5	High
Competitive Advantage	3.946	0.516		High

In Table 4.8, the overall scale mean of competitive advantage was 3.946 with a standard deviation (SD) of 0.516, indicating a generally high perception among respondents. The highest mean score of 4.175 was reported for both “The enterprise improves the quality of its services based on feedback” and “The enterprise has a strategic plan aimed at keeping pace with developments in the external environment,” highlighting strong emphasis on service quality and strategic planning. The lowest mean of 3.460 was observed for “The enterprise determines the cost of training employees on digital,” suggesting relatively less focus on investment in digital training.

4.3.3 The Descriptive Statistics for the Mediating Variable (Innovation)

To accurately display the search results, the mean and standard deviation of each variable were calculated. For instance, Table 4.9 expresses the mean, standard deviation, order, and importance of **Innovation**.

Table 4.9: The mean, Standard Deviation, Order, and Importance of Innovation.

Items	Mean	SD	rank	importance
1. Our organization regularly generates new ideas to improve its services.	4.064	0.816	3	High
2. Our organization actively explores innovative methods to perform tasks.	4.143	0.775	2	High
3. Our organization consistently introduces new products or services within regular timeframes.	3.984	0.865	4	High
4. Our organization invests in R&D and digital capabilities to stay ahead of competitors.	3.937	0.872	7	High
5. Our organization continually enhances the services it provides to customers.	4.191	0.796	1	High
6. Our organization encourages employees to adopt and apply innovative approaches at work.	4.191	0.815	1	High
7. Our organization has dedicated centers or mechanisms to develop and test new ideas.	3.762	0.957	5	High
8. Our organization offers innovative services that are not available from competitors.	3.984	0.953	6	High
Innovation	4.032	0.713		High

In Table 4.9, the overall scale mean of innovation was 4.032 with a standard deviation (SD) of 0.713, indicating a high level of innovation perceived by respondents. The highest mean of 4.191 was reported for two items: “Our organization continually enhances the services it provides to customers” and “Our organization encourages employees to adopt and apply innovative approaches at work,” reflecting strong emphasis on service improvement and employee-driven innovation. The lowest mean of 3.762 was observed for “Our organization has dedicated centers or mechanisms to develop and test new ideas,” suggesting relatively less focus on formal innovation infrastructure.

4.4 Test of Normality

The study should evaluate the normal distribution of all items measuring the constructs before modeling the structural model and performing Structural Equation Modeling (SEM). Because SEM uses a parametric statistical approach, it is crucial to assess the normality of all items with respect to the constructs they represent. Following Awang et al. (2015), the study only needs to demonstrate that the skewness of all items

is within a reasonable range, that is, not lower than -2 and not higher than 2, which implies the study is not too skewed. The findings of the normality test for all items are presented in Table 4.10.

Table 4.10: The test of normality on all components (sub-constructs).

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
e_digital1	252	-.559	.153	-.152	.306
e_digital2	252	-.653	.153	.052	.306
e_digital3	252	-.819	.153	.365	.306
e_digital4	252	-1.027	.153	1.141	.306
e_digital5	252	-.522	.153	-.725	.306
e_digital6	252	-1.029	.153	1.270	.306
e_digital7	252	-1.038	.153	1.360	.306
e_digital8	252	-.306	.153	-.553	.306
data_drivin1	252	-1.382	.153	2.099	.306
data_drivin2	252	-1.114	.153	2.068	.306
data_drivin3	252	-1.386	.153	2.142	.306
data_drivin4	252	-.879	.153	2.120	.306
data_drivin5	252	-.647	.153	.141	.306
Soc.med1	252	-.441	.153	-.414	.306
Soc.med2	252	-.389	.153	.054	.306
Soc.med3	252	-.349	.153	-.469	.306
Soc.med4	252	-.322	.153	.554	.306
Soc.med5	252	-.888	.153	1.682	.306
Soc.med6	252	-1.154	.153	1.789	.306
Cloud.bas1	252	-.967	.153	.293	.306
Cloud.bas20	252	-.855	.153	.015	.306
Cloud.bas3	252	-1.156	.153	1.181	.306
Cloud.bas4	252	-1.026	.153	.358	.306
Cloud.bas5	252	-1.145	.153	.758	.306
Per.markAI1	252	-.622	.153	.391	.306
Per.markAI2	252	-.645	.153	.669	.306
Per.markAI3	252	-.560	.153	.789	.306
Per.markAI4	252	-.688	.153	1.085	.306
Per.markAI5	252	-.841	.153	1.517	.306
Per.markAI6	252	-.556	.153	.662	.306
competitive1	252	-.492	.153	.015	.306
competitive2	252	-.824	.153	.452	.306
competitive3	252	-.538	.153	.149	.306
competitive4	252	-1.224	.153	1.549	.306
competitive5	252	-.813	.153	.995	.306
competitive6	252	-.713	.153	.275	.306
competitive7	252	-.103	.153	-.416	.306
competitive8	252	-.691	.153	.860	.306
competitive9	252	-1.183	.153	1.390	.306
competitive10	252	-.824	.153	1.832	.306
competitive11	252	-.713	.153	1.056	.306
competitive12	252	-.538	.153	.384	.306

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
competitive13	252	-.312	.153	-.219	.306
innovation1	252	-1.183	.153	1.390	.306
innovation2	252	-1.288	.153	1.276	.306
innovation3	252	-.862	.153	1.061	.306
innovation4	252	-.893	.153	1.065	.306
innovation5	252	-1.504	.153	3.694	.306
innovation6	252	-1.431	.153	3.154	.306
innovation7	252	-.608	.153	-.041	.306
innovation8	252	-1.082	.153	.867	.306

4.5 Measurement Model

The validity and reliability of any quantitative study, especially one that uses advanced statistical methods such as structural equation modeling (SEM), depend heavily on the strength of its measurement model. It is the measurement model that serves as the point of reference for the connection between abstract theoretical concepts and practical, observable indicators. The operational mechanism is what transforms the latent variables, which are not directly measurable, like a construct, like “Enterprise Digitalization” or “competitive advantage”, into measurable data, usually in the form of items on a survey or other measurements. A rigorous, systematic assessment of the measurement model's quality is crucial before proceeding with the structural analysis, which will test the hypothesized relationships among these constructs. Such analysis is not a formal, procedural aspect, but a critical validation measure that ensures subsequent results are built on a solid, significant foundation. A poor measurement model may result in incorrect or completely invalid conclusions, despite the complexity of the structural analysis. Thus, this part will elaborate on the evaluation of the measurement model through a careful analysis of three key indicators: reliability, validity, and collinearity.

The first indicator, reliability, concerns the consistency and stability of the measurement. It tries to respond to the question: “Would it give the same results, in case the measurement was repeated under the same conditions?” In particular, this paper targets internal consistency reliability, which examines whether the various items created to quantify one construct are indeed operating together. In a nutshell, it evaluates whether these items all develop the same underlying concept, which provides a clear and consistent image of the construct under question. Any scores observed may be attributed

to random error rather than an actual representation of the construct, and hence the data are meaningless without reliability.

After the reliability test, the consideration of validity is arguably the most important part of measurement. Validity answers the ultimate question of accuracy: “Are we really measuring what we intend to measure?” This inquiry is dichotomous into two fundamental elements. Convergent validity studies the extent to which several indicators of a particular construct agree or coincide to affirm that they are actually measuring the same theoretical concept. Discriminant validity, on the other hand, is used to guarantee that this construct is not confused with other constructs in the model. It confirms that measuring one construct does not accidentally capture the nature of another, thereby providing a definite boundary and theoretical distinction between the variables. Convergent and discriminant validity combined prove that the measurement model is not only valid in its description but also in its definition of constructs.

Lastly, the section discusses the possible problem of multicollinearity, or, in other words, collinearity among the latent variables. This statistical issue arises when two or more independent variables in a model are highly interrelated; thus, it is not easy to identify the separate effects of the independent variables on the dependent variable. Within the framework of this research, collinearity measurement is the most critical point for determining whether the relationships between constructs are real and not a product of exaggerated intercorrelations. When “data-driven”, “decision-making”, and “application of artificial intelligence” were so closely interrelated that they were virtually gauging the same phenomenon, one would not be able to identify their distinct effect on the notion of “competitive advantage”. The analysis of collinearity helps the researcher protect against falsely attributing impacts and ensures that the structural model can effectively approximate the individual impact of each construct. These three indicators, which are systematically verified, i.e., reliability, validity, and collinearity, are combined to define the overall adequacy and strength of the measurement model. With the help of these indicators, there is a basis to move on to a more complex structural analysis and to interpret the study's results authoritatively.

4.5.1 Reliability

Reliability, as applied in psychometric measurement, is the degree of consistency in the measurement of a construct. It is an assessment of validity; a measurement instrument can never be deemed valid unless it is initially reliable. This paper focuses on internal consistency reliability, which measures how well the items (or indicators) of a measurement scale are correlated with each other and serve as a unit to describe the essence of the latent construct they are supposed to measure. According to the definition of Sun et al. (2007), this kind of reliability measures the extent to which the items in a scale are effective in an intended concept of the measurement. High internal consistency indicates that all the items are “singing on the same hymn sheet”, and it is oriented on one common underlying construct. On the other hand, the low internal consistency would imply that the items are dissimilar, may address diverse notions, or have a high measurement error rate, which would impair the integrity of the construct.

To measure this internal consistency, scholars use multiple measures of reliability, the most commonly used being Cronbach's alpha. This coefficient computes the average intercorrelation across all items in a scale, yielding a single value that reflects the scale's overall reliability. As observed by Sekaran and Bougie (2013), a widely accepted rule of thumb is that a Cronbach's alpha value of 0.7 or above is considered satisfactory, and that the items have a common sufficient variance to be considered a reliable measure. Nevertheless, despite its extensive application, Cronbach's alpha has a major theoretical limitation: it is based on a so-called “tau-equivalent” assumption, which assumes that all items in a construct have the same contribution to the measurement of that construct. Factors. In fact, some items tend to be better predictors of a construct than others, as evidenced by varying loadings in a confirmatory factor analysis. Cronbach's alpha fails to capture the different contributions, which may result in underestimation or overestimation of the scale's actual reliability.

Considering this shortcoming, the present study has decided to focus on composite reliability (CR) rather than Cronbach's alpha to obtain a more precise estimate of the internal consistency of the modified scales. This methodological decision is consistent with the suggestions of modern scholars such as Götz et al. (2009), who argue that composite reliability provides a more accurate and more true-to-life estimate of a construct's reliability. Unlike the alpha of Cronbach, composite reliability does not

assume equal item weighting. It instead uses the actual item factor loadings, placing more weight on those that better reflect the latent construct. This method accounts for the difference in contributions. It recognizes that an item loading 0.8 on a construct is a stronger and more dependable measure than a loading of 0.5, and that the composite reliability score reflects this difference. The acceptable composite reliability levels introduced by Hair et al. (2017) are above 0.60, but in a confirmatory study, the acceptable range is 0.70 to 0.90. Such values indicate that the items of the construct show high internal consistency and are not redundant. By using composite reliability, this study will provide a more robust examination of its measurement scales, further buttressing its future analyses.

4.5.2 Validity

Convergent validity

According to Hair et al (2014), the degree to which the indicators of a latent construct are associated with each other is a true reflection of the intended construct. It is usually measured in terms of the Average Variance Extracted (AVE), which quantifies the average amount of variance shared between a construct and its indicators. AVE of over 0.5 is considered normal in order to affirm convergent validity (Barclay et al., 1995).

As indicated in Table 4.12, all constructs have AVE values above 0.5; hence, convergent validity is achieved in the study. The results in Table 4.11 and Figure 1 indicate that the composite reliability coefficients for the constructs in the study are satisfactory, as all exceed the acceptable level of 0.70.

Table 4.11: Assessment of the measurement model.

	Outer loadings >.6	Cronbach's alpha >.7	Composite reliability >.6	Average variance extracted (AVE) >.5
Digital_ Entrepreneurship		0.944	0.949	0.59
Cloud.bas		0.947	0.949	0.827
Cloud.bas1	0.878			
Cloud.bas2	0.92			
Cloud.bas3	0.946			
Cloud.bas4	0.878			
Cloud.bas5	0.922			
data_drivin		0.882	0.883	0.68
data_drivin1	0.791			
data_drivin2	0.826			
data_drivin3	0.853			
data_drivin4	0.824			
data_drivin5	0.826			
e_digital		0.88	0.896	0.547
e_digital1	0.71			
e_digital2	0.757			
e_digital3	0.759			
e_digital4	0.743			
e_digital5	0.784			
e_digital6	0.778			
e_digital7	0.861			
e_digital8	0.673			
Per.markAI		0.962	0.962	0.841
Per.markAI1	0.904			
Per.markAI2	0.922			
Per.markAI3	0.905			
Per.markAI4	0.941			
Per.markAI5	0.916			
Per.markAI6	0.915			
Soc.med		0.867	0.875	0.603
Soc.med1	0.794			
Soc.med2	0.815			
Soc.med3	0.767			
Soc.med4	0.746			
Soc.med5	0.858			
Soc.med6	0.666			
Innovation		0.938	0.941	0.699
innovation1	0.794			
innovation2	0.867			
innovation3	0.837			
innovation4	0.84			
innovation5	0.874			
innovation6	0.903			
innovation7	0.799			
innovation8	0.765			
Competitive_ Advantage		0.909	0.913	0.509

	Outer loadings >.6	Cronbach's alpha >.7	Composite reliability >.6	Average variance extracted (AVE) >.5
competitive1	0.604			
competitive2	0.674			
competitive3	0.688			
competitive4	0.686			
competitive5	0.728			
competitive6	0.787			
competitive7	0.697			
competitive8	0.727			
competitive9	0.662			
competitive10	0.758			
competitive11	0.629			
competitive12	0.678			
competitive13	0.657			

As indicated by Hair *et al.* (2011), internal consistency reliability is assessed using the composite reliability coefficient, which should meet a minimum threshold of 0.70. The values in Table 4.13 indicate that the composite reliability coefficients for the constructs in this study are satisfactory, as all exceed the acceptable level of 0.70.

Discriminant Validity

Table 4.12 represents the results of variable correlation using the Fornell-Larcker approach to assess the discriminant validity of the measurement model.

Table 4.12: Variable correlation-root square of AVE.

		1	2	3	4	5	6	7	8
1	Cloud-Based Collaboration	0.909							
2	Competitive_ Advantage	0.707	0.713						
3	Digital_ Entrepreneurship	0.759	0.642	0.768					
4	Innovation	0.535	0.646	0.715	0.836				
5	Personalized Marketing with AI	0.355	0.558	0.763	0.468	0.917			
6	social media engagement	0.265	0.505	0.658	0.501	0.591	0.777		
7	Data-driven decision making	0.457	0.698	0.711	0.537	0.529	0.492	0.825	
8	E-business optimization	0.724	0.676	0.726	0.656	0.37	0.272	0.564	0.74

According to Fornell and Bookstein (1982), discriminant validity is assessed using the correlation method, which states that it exists when the square root of the Average Variance Extracted (AVE) for a given variable exceeds the correlation coefficients between that variable and any other variables. This means that the value should be higher

than the off-diagonal elements in the correlation matrix. The correlation matrix from this study confirmed this criterion, thereby demonstrating the discriminant validity of the employed measurements.

4.5.3 Collinearity

In any quantitative analysis that employs multiple regression or structural equation modeling (SEM), a preliminary yet critical assumption to be tested is that of multicollinearity. Multicollinearity occurs when two or more independent variables in a model are highly correlated (Henseler et al., 2014). This situation has no impact on the model's overall predictive ability (R^2), but it devastates the integrity of individual predictor variables. Multicollinearity makes it difficult to estimate the distinct contribution of each independent variable to the dependent variable. This may result in a number of undesired effects: the regression coefficients will become unstable and change drastically with even slight changes in the model or data, their signs may even be counterintuitive, and their standard errors will be inflated (Hair et al., 2006). This inflation of standard errors, as Tabachnick and Fidell (2013) warn, will decrease the t-statistic for each coefficient, potentially resulting in a Type II error in which a truly significant predictor is wrongly considered non-significant. Essentially, multicollinearity masks the true relationship between variables, making it impossible to determine with certainty which independent variable is driving the explanation of the dependent variable.

This was a matter that was especially relevant in this research. These five dimensions of Enterprise Digitalization (ED): E-business Optimization, Data-Driven Decision Making, Social Media Engagement, Cloud-Based Collaboration, and Personalized Marketing with AI were the independent variables. At the conceptual level, these dimensions are aspects of a higher-level strategy orientation. It is quite credible that a successful SME, which makes data-driven decisions, is also likely to use cloud-based collaboration and social media effectively. This conceptual overlap, per se, increases the likelihood of multicollinearity and, hence, the diagnosis of it is not only a procedural matter but also a necessity for the validity of further testing of the hypothesis.

To critically examine multicollinearity, a two-pronged approach was taken. First, the Pearson correlation matrix of all independent variables was investigated to identify any overly high pairwise correlations (usually, any value above 0.80 is a cause for

concern). Second, and more in-depth, the research also assessed the Variance Inflation Factor (VIF) and its inverse, Tolerance, of every latent construct. The VIF measures how much the variance of an estimated regression coefficient increases due to collinearity. It is calculated by regressing one independent variable on all other independent variables and taking the ratio of $1/(1 - R^2)$. A VIF value of 1 indicates no correlation, while higher values suggest increasing multicollinearity. Tolerance, which is simply $1 - R^2$, indicates the proportion of a variable's variance not explained by the other independent variables.

According to established guidelines, multicollinearity is considered a serious problem if the VIF value exceeds 10; a more conservative threshold of 5 is also widely cited, and some researchers suggest that values above 2.5 may warrant concern (Hair et al., 2011). Correspondingly, Tolerance values falling below 0.10 (or more conservatively, 0.20) signal a potential issue. Table 4.6 presents the Tolerance and VIF values for the five latent constructs representing the dimensions of Enterprise Digitalization.

Table 4.13: Tolerance and Variance Inflation Factors (VIF) for Latent Constructs.

Latent Construct	Tolerance	VIF
E-business optimization	0.416	2.402
Data-driven decision making	0.533	1.878
Social media engagement	0.614	1.627
Cloud-Based Collaboration	0.464	2.157
Personalized Marketing with AI	0.571	1.753

The data in Table 4.6 clearly indicate that multicollinearity is not a problem in this study. All VIF values are well below the conservative threshold of 5, with the highest being 2.402 for E-business optimization. Correspondingly, all Tolerance values are comfortably above the 0.20 threshold. This is a highly reassuring finding. It confirms that, while the dimensions of Enterprise Digitalization are conceptually related, they are empirically distinct enough among the surveyed Palestinian SMEs to be treated as separate constructs. The statistical model thus uniquely predicts the individual contribution of each dimension to the dependent variables (Innovation and Competitive Advantage). This result justifies the integrity of the research model and provides a strong basis for interpreting the path coefficients and for hypothesis testing that ensues.

4.6 Structural Model

To investigate the correlation among Enterprise Digitalization, innovation, and competitive advantage in SMEs, this research used simple linear regression and path analysis. The analysis has examined direct and mediating effects to determine the extent to which Enterprise Digitalization and its dimensions contribute to innovation and competitive advantage. The results of hypothesis testing, the coefficient of determination (R^2), and the effect size (f^2) are presented in the following sections and indicate the significance and strength of these relationships.

4.6.1 Direct Relationships

In this section, the findings of the path coefficient used to test the research hypotheses were discussed. The finding of direct effect hypotheses (H_1 , H_2 and H_3) presented in Table (4.14-4.18).

First Main Hypothesis

H1: There is a positive impact of Enterprise Digitalization on competitive advantage in SMEs.

Table 4.14: Simple Linear Regression Results for the Impact of Enterprise Digitalization on Competitive Advantage.

	β	mean	SD	T statistics	P values
Enterprise Digitalization -> Competitive Advantage	0.843	0.843	0.024	34.985	0.000

$R^2 = 0.71$

The findings of the simple linear regression analysis testing the effect of Enterprise Digitalization on the competitive advantage are shown in Table 4.14. The results demonstrate a significant positive influence where the standardized (β) value (0.843) has a t-value of 34.985 and p-value of 0.000, and prove that the relation between the two variables is statistically significant. The R^2 of 0.71 indicates that Enterprise Digitalization can account for 71% of the variations in competitive advantage, which is a significant contribution to modifying the competitive advantage of enterprises (**Figure 4.1**).

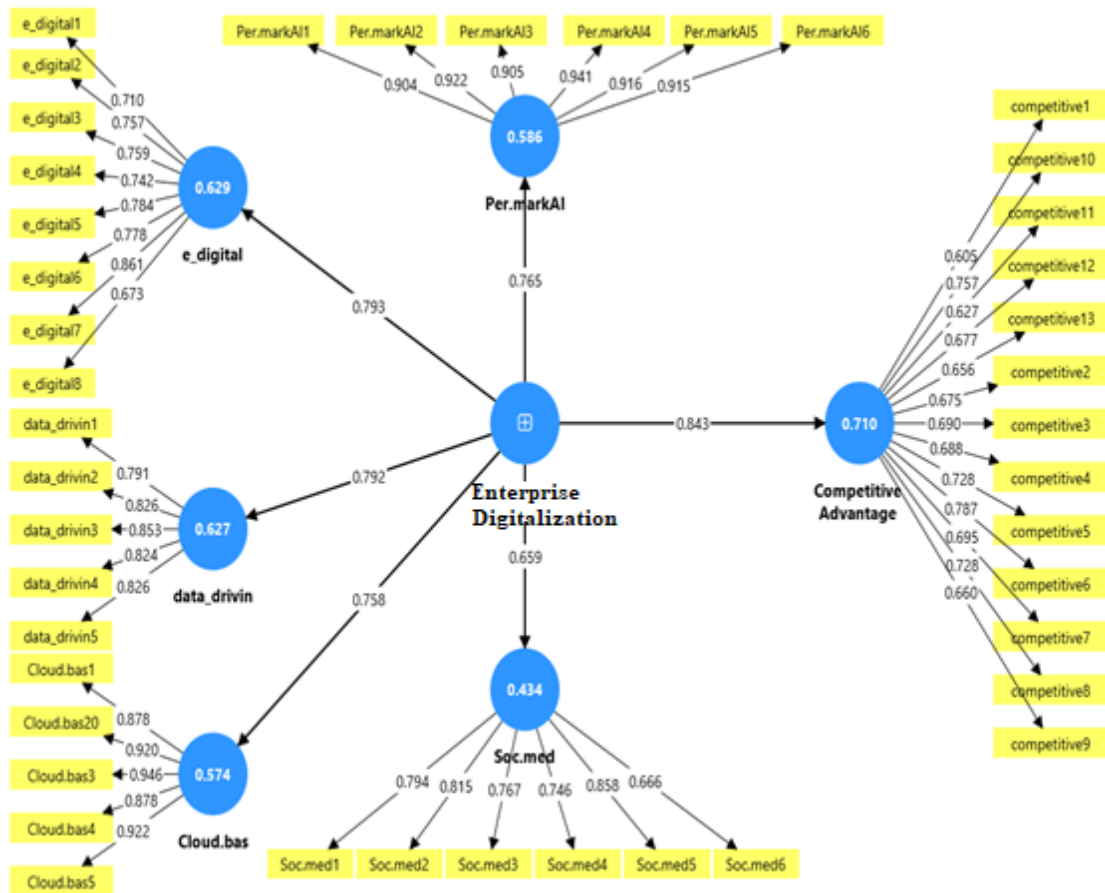


Figure 4.1: Simple Linear Regression Results for the Impact of Enterprise Digitalization on Competitive Advantage.

A simple linear regression analysis was used to determine the direct impact of each independent variable on competitive advantage in SMEs. This technique is suitable because it estimates the strength of the relationship between a predictor variable and the dependent variable, providing values for the beta coefficient (β), the mean and standard deviation (SD), the t-statistic, and the level of significance (p-value). When the t-statistics and p-values indicate the strength and validity of the relationship, a large positive β indicates that the independent variable contributes positively to competitive advantage. In this manner, the hypotheses H1.1-H1.5 were tested.

Table 4.15: Hypothesis Testing Results for the Effect of AI Dimensions on Competitive Advantage.

hyp.	Path	β	mean	SD	T statistics	P values
H1.1	e_digital -> Competitive Advantage	0.105	0.108	0.049	2.149	0.032
H1.2	data_drivin -> Competitive Advantage	0.310	0.309	0.042	7.382	0.000
H1.3	Soc.med -> Competitive Advantage	0.135	0.138	0.051	2.664	0.008
H1.4	Cloud.bas -> Competitive Advantage	0.445	0.443	0.046	9.720	0.000
H1.5	Per.markAI -> Competitive Advantage	0.119	0.118	0.039	3.043	0.002

$R^2 = 0.75$

The findings reveal that competitive advantage has strong predictive power, as the proposed model accounts for 75% of the variance ($R^2 = 0.75$). Among the predictors, cloud-based systems ($\beta = 0.445$, $p < 0.001$) and data-driven practices ($\beta = 0.310$, $p < 0.001$) have the most substantial positive impact on competitive advantage. Also, perceived marketing AI ($\beta = 0.119$, $p = 0.002$) and the use of social media ($\beta = 0.135$, $p = 0.008$) have a lesser, but significant effect. The weakest, though still significant, effect is found in e-digital transformation ($\beta = 0.105$, $p = 0.032$). In general, the findings validate all the hypotheses (H1.1–H1.5), bearing in mind that AI-motivated elements complement one another and independently enhance competitive advantage.

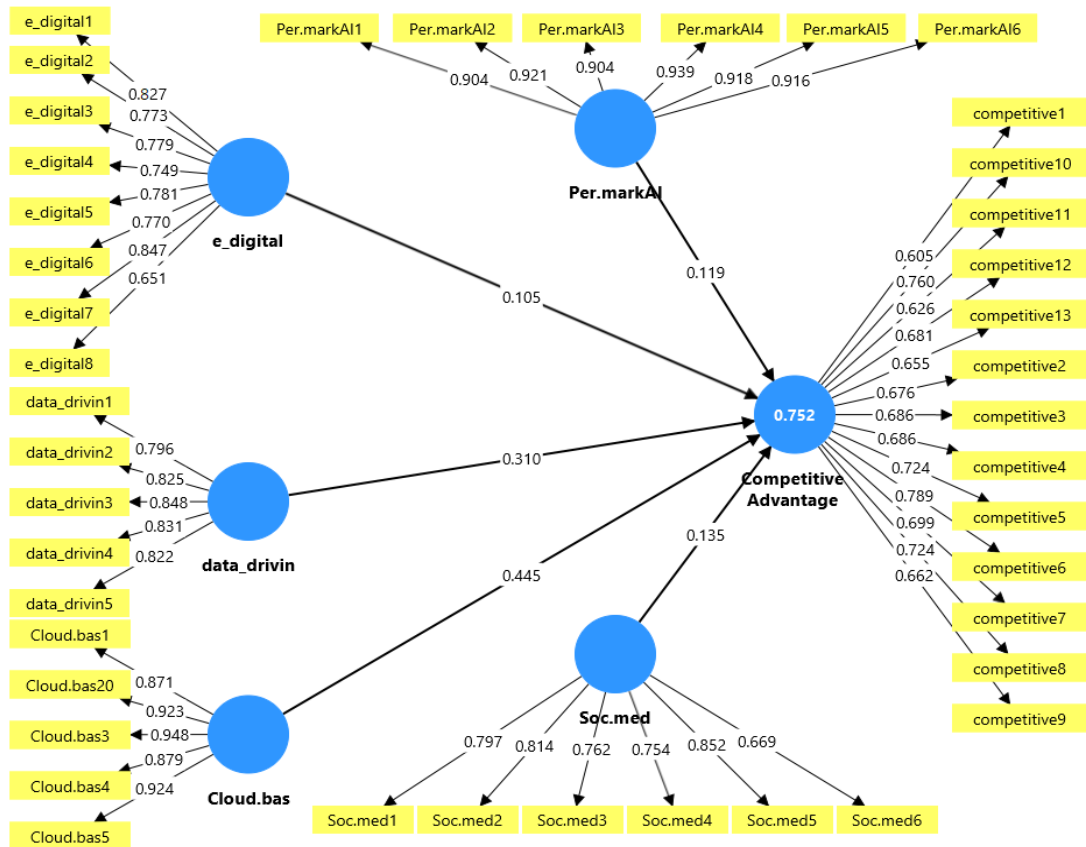


Figure 4.2: Hypothesis Testing Results for the Effect of AI Dimensions on Competitive Advantage.

Second Main Hypothesis

A simple linear regression analysis was used to identify the direct impact of each independent variable on Innovation in SMEs. This technique is suitable because it will estimate how much one predictor variable affects the dependent variable, giving the values of the beta coefficient (β), mean, standard deviation (SD), t-statistics, and the level of significance (p-value). The large positive β value indicates that the independent variable has a positive contribution to Innovation, and the t-statistics and p-values confirm the validity and strength of the association. Hypotheses H2.1 through H2.5 were therefore tested by means of this approach.

H2: There is a positive impact of Enterprise Digitalization on innovation in SMEs.

Table 4.16: Simple Linear Regression Results for the Impact of Enterprise Digitalization on Innovation.

	β	mean	SD	T statistics	P values
Enterprise Digitalization -> Innovation	0.717	0.720	0.040	18.115	0.000

$R^2 = 0.514$

The outcomes of the simple linear regression analysis that was conducted to investigate the effect of Enterprise Digitalization on innovation are shown in Table 4.16. The results are strong positive and statistically significant effects, with the standardized beta coefficient (β) of 0.717, t-value of 18.115, and p-value of 0.000. The R^2 value of 0.514 indicates that Enterprise Digitalization explains 51.4% of the variation in innovation, demonstrating its significant role in promoting innovative practices in enterprises (Figure 4.3).

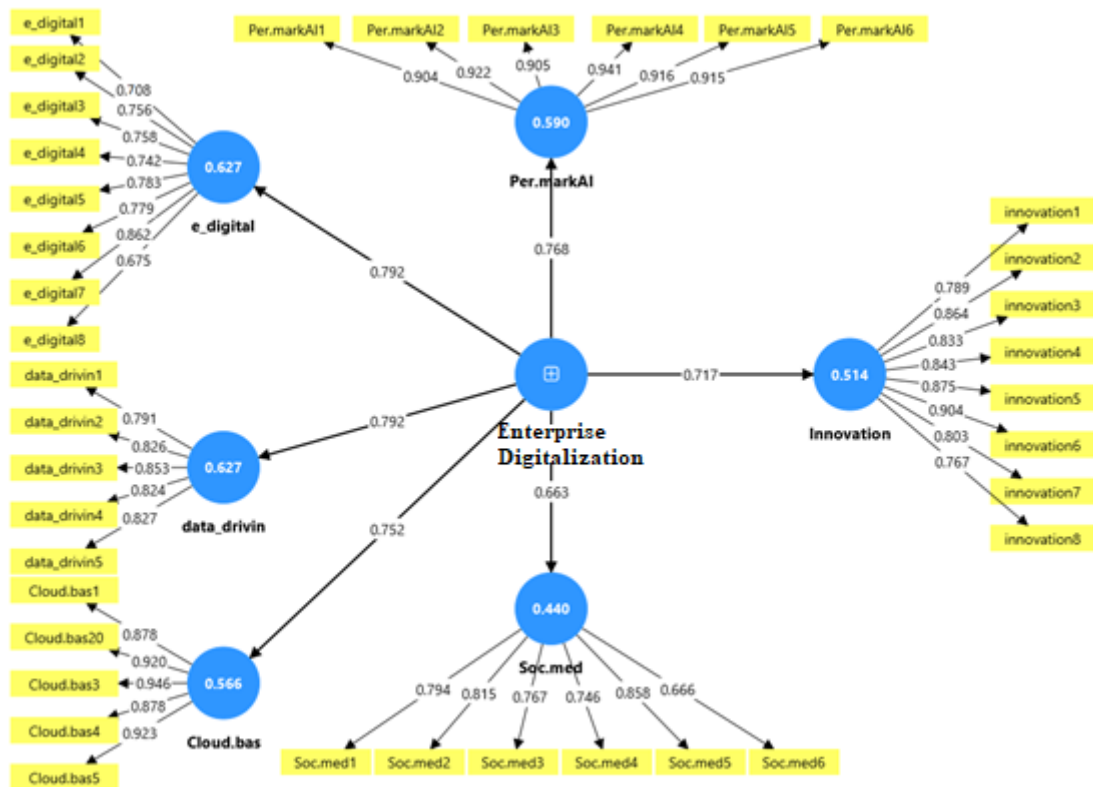


Figure 4.3: The Impact of Enterprise Digitalization on Innovation.

To analyze how artificial intelligence (AI) dimensions impact innovation, the present research examined the effects of cloud-based systems, data-driven practices, e-digital transformation, perceived marketing AI, and social media usage. To determine the

direction, magnitude, and statistical significance of each relationship, path coefficients (β), mean values, SD, and t-statistics, p-values were computed.

Table 4.17: Hypothesis Testing Results for the Effect of AI Dimensions on Innovation.

Hyp.	Path	β	mean	SD	T statistics	P values
H2.1	E_Digital -> Innovation	0.466	0.451	0.116	4.021	0.000
H2.2	Data_Drivin -> Innovation	0.061	0.069	0.060	1.010	0.312
H2.3	Soc.Med -> Innovation	0.293	0.293	0.046	6.403	0.000
H2.4	Cloud.Bas -> Innovation	0.081	0.088	0.077	1.045	0.296
H2.5	Per.Markai -> Innovation	0.061	0.066	0.067	0.919	0.358

$R^2 = 0.563$

Table 4.17 indicates that not all AI dimensions significantly influence innovation. E-digital transformation ($\beta = 0.466, p < 0.001$) and social media use ($\beta = 0.293, p < 0.001$) showed strong and significant positive effects on innovation, highlighting their central role in driving new ideas and practices. In contrast, cloud-based systems ($\beta = 0.081, p = 0.296$), data-driven practices ($\beta = 0.061, p = 0.312$), and perceived marketing AI ($\beta = 0.061, p = 0.358$) did not show significant impacts, suggesting that their contribution to innovation may be more indirect or context-dependent, as shown in **Figure 4.4**.

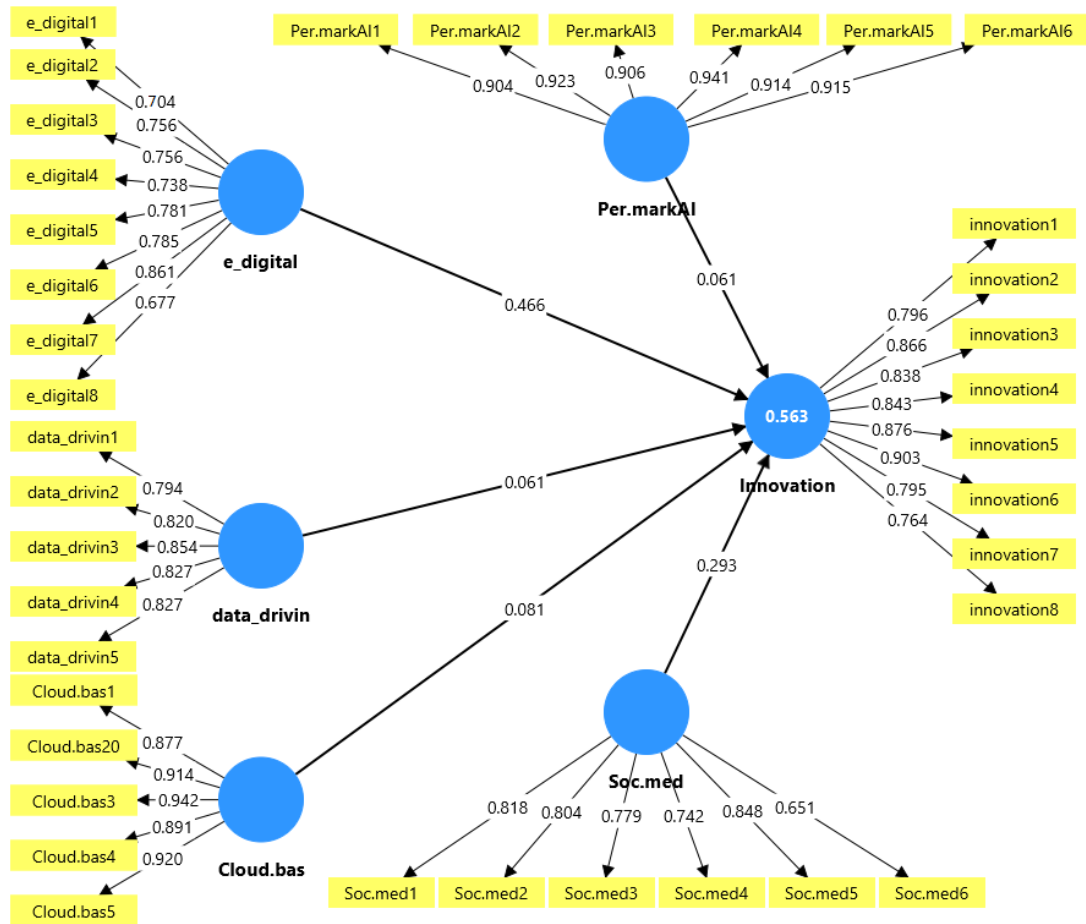


Figure 4.4: Hypothesis Testing Results for the Effect of AI Dimensions on Innovation.

Third Hypothesis

H3: There is a positive impact of innovation on competitive advantage in SMEs.

Table 4.18: Simple Linear Regression Results for the Impact of Innovation on Competitive Advantage.

	β	mean	SD	T statistics	P values
Innovation -> Competitive Advantage	0.290	0.301	0.080	3.614	0.006

Table 4.18 presents the results of the simple linear regression analysis examining the impact of innovation on competitive advantage. The findings indicate a positive and statistically significant effect, with a standardized beta coefficient (β) of 0.290, a t-value of 3.61, and a p-value of 0.000 (**Figure 4.5**).

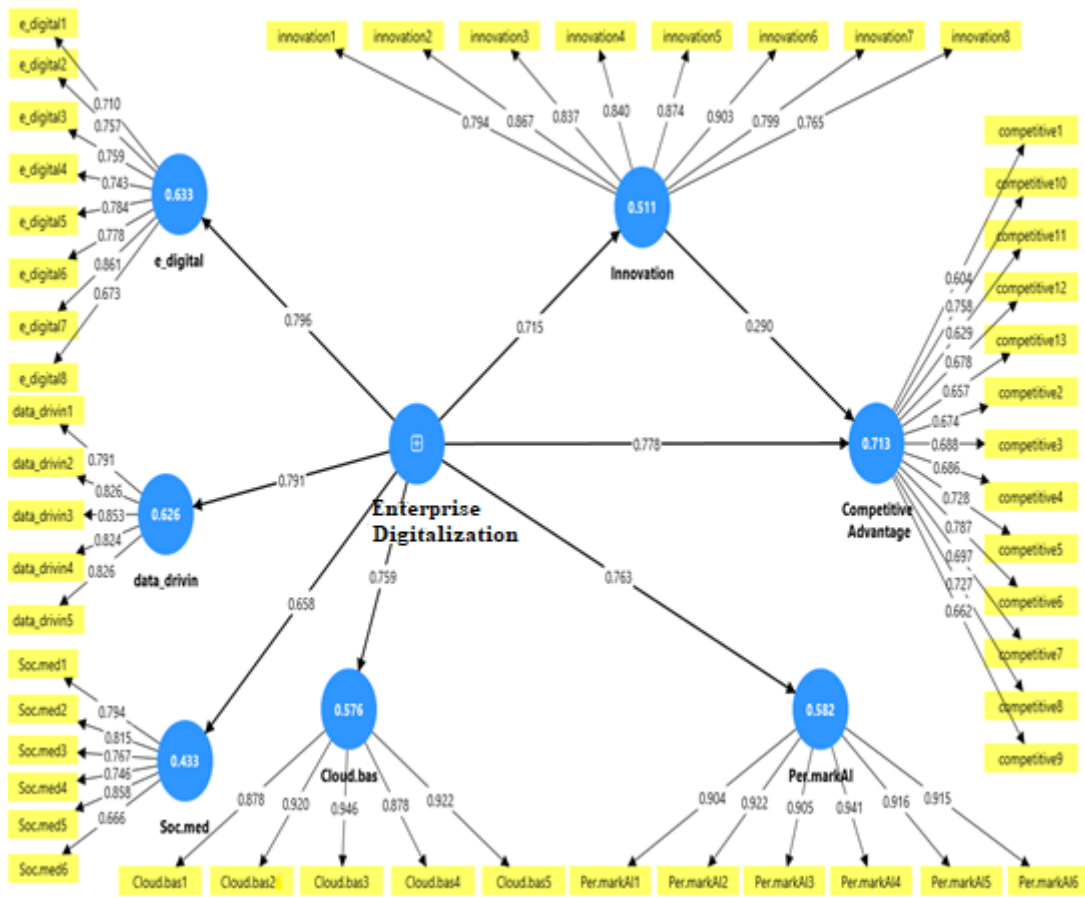


Figure 4.5: The Impact of Innovation on Competitive Advantage.

4.6.2 Mediating Relationships

To examine the fourth hypothesis, this section delves into the pivotal role of innovation as a mediator in the relationship between Enterprise Digitalization and competitive advantage within SMEs. This is the key analysis of the study in terms of its theoretical contribution, because the analysis of a simple direct-effects model is only at the beginning of understanding that more complex, process-driven mechanisms are involved. With the help of Smart-PLS, the investigation decomposes the total effect of Enterprise Digitalization on competitive advantage into direct and indirect components. The analysis of the path coefficients (β), their statistical significance (T and P), coefficient of determination (R^2), and effect size (f^2) provides an in-depth and detailed analysis of how Enterprise Digitalization leads to competitive advantage directly and indirectly via a catalytic effect of innovation.

H4: The effect of having Enterprise Digitalization on the competitive advantage of SMEs is mediated by innovation.

Table 4.19 illustrates the breakdown of the direct, indirect, and total effects, and it is through this that the statistical evidence needed to test this hypothesis can be found. The findings are very convincing of the postulated mediation model, with an advanced, highly complex dual-pathway to competitive advantage.

Table 4.19: The breakdown of the direct, indirect, and total effects.

Path	β	mean	SD	T statistics	P values
Direct Effect					
Digital_ Entrepreneurship -> Competitive_ Advantage	0.778	0.767	0.066	11.776	0.000
Digital_ Entrepreneurship -> Innovation	0.715	0.718	0.040	18.015	0.000
Innovation -> Competitive_ Advantage	0.290	0.301	0.080	3.614	0.006
Indirect Effect					
Enterprise Digitalization -> Innovation -> Competitive Advantage	0.207	0.217	0.061	3.39	0.008
Total Effect					
Digital_ Entrepreneurship -> Competitive_ Advantage	0.985	0.942	0.024	41.041	0.000

This analysis starts by validating the two premise courses of the mediation model. To start, Enterprise Digitalization has a strong, statistically significant direct impact on competitive advantage ($\beta = 0.778$, $t = 11.776$, $p = 0.000$). Second, it is also characterized by a strong impact on innovation ($\beta = 0.715$, $t = 18.015$, $p = 0.000$), which demonstrates that digital transformation is a strong driver of innovative practices in SMEs. This initial direction is essential; without a strong connection between the independent variable (Enterprise Digitalization) and the mediator (innovation), the mediation chain will be interrupted.

The third channel, between innovation and competitive advantage, is also good and important ($\beta = 0.290$, $t = 3.614$, $p = 0.006$). Although the coefficient is not as high as the direct impact of Enterprise Digitalization, its statistical significance indicates that digitalization indeed results in a better competitive advantage. This confirms the primary assumption of the Schumpeterian theory in this digital environment.

The critical mediation test is the importance of the indirect effect. The findings indicate that the indirect effect of Enterprise Digitalization on competitive advantage through innovation is 0.207 and is significantly different ($t = 3.39$, $p = 0.008$). This is a strong argument that innovation is a practical tool that uses digitalization to have an impact. This, in practice, implies that some of the competitive advantage accrued by SMEs is not only through the use of digital tools, but also through the new ideas, products, and processes that such tools assist in producing.

The results show partial mediation: the direct impact of Enterprise Digitalization on competitive advantage ($\beta = 0.778$) remains large and significant even after the inclusion of a mediator in the model. This dual pathway is very revelatory as a result of this partial mediation:

1. **A Direct Path:** Enterprise Digitalization has a direct competitive advantage, probably due to operational efficiency, better market access, and reduced costs, regardless of its impact on innovation.
2. **An Indirect Path:** Innovation is also triggered by Enterprise Digitalization, but this leads to a separate, incremental increase in competitive advantage.

Lastly, the overall impact ($\beta = 0.985$, $t = 41.041$, $p = 0.000$) is exceedingly strong, highlighting the immense influence of Enterprise Digitalization. When both direct and innovation-fueled benefits are combined, their influence on competitive advantage is nearly one-to-one. This comprehensive analysis confirms H4 and illustrates that the most successful SMEs are likely those that leverage digitalization not only for immediate gains but also as a strategic engine for continuous innovation (Figure 4.6).

4.6.2.1 Coefficient of Determination (R^2) Value

Calculating effect size (R^2) is done when the changes between two variables in the correlation exist. In this study, the smart-PLS algorithm function is used to obtain the values R^2 as indicated in Table 4.28.

Table 4.20: R-square of the Endogenous latent variables.

	R-square	R-square adjusted
Innovation	0.511	0.509
Competitive_ Advantage	0.713	0.711

Table 4.20 presents the direct, indirect, and total effects of Enterprise Digitalization and innovation on competitive advantage. The results indicate that Enterprise Digitalization has a strong direct effect on competitive advantage ($\beta = 0.778$, $t = 11.776$, $p = 0.000$) and also a significant direct effect on innovation ($\beta = 0.715$, $t = 18.015$, $p = 0.000$). Innovation, in turn, positively impacts competitive advantage ($\beta = 0.290$, $t = 3.614$, $p = 0.006$). The indirect effect of Enterprise Digitalization on competitive advantage through innovation was also significant ($\beta = 0.207$, $t = 3.39$, $p = 0.008$), indicating a partial mediation. In general, the overall impact of Enterprise Digitalization on competitive advantage, both directly and indirectly ($\beta = 0.985$, $t = 41.041$, $p = 0.000$), is large, indicating a significant contribution of Enterprise Digitalization and innovation to the improvement of enterprises' competitive position.

4.6.2.2 The Effect Size (F^2) Value

Although p-value hypothesis testing can be used to determine whether a relationship exists between constructs (statistical significance), it does not imply the extent or practical significance of that relationship. A statistically significant finding with a small effect size may have little or no practical value to a manager or policymaker. Thus, to determine the actual relevance and effectiveness of the meaningful relationships revealed in this research, their effect sizes should be evaluated (Hair et al., 2014). The effect size analysis goes beyond the easy question of "Is there an effect?" To the more serious question, "How great is the effect?"

The effect size (f^2) value is used in this analysis and is a metric that can be used to assess the effect of a predictor construct on an endogenous construct. In particular, the (f^2) value is used to determine the proportion of variance in an endogenous (dependent) construct that is accounted for by an exogenous (independent) construct, in addition to the extent of the variance accounted for by other constructs in the model. It has substantive significance, indicating the strength of an exogenous construct in explaining a given endogenous construct. (f^2) Value interpretation is informed by the generally accepted guidelines of Cohen (1988), who provided operationalized benchmarks for evaluating effect size.

Cohen (1988) categorizes effect sizes into three levels:

- $f^2 \geq 0.35$: It implies a large effect size. This is a considerable effect, as the predictor construct is an important aspect of the outcome description.
- $f^2 \geq 0.15$: Represents a medium effect size. This is a significant, observable influence of practical importance.
- $f^2 \geq 0.02$: A small effect size is indicated. Although statistically significant, the effect is quite small and may not have much practical use on its own.

Using this structure, we can go beyond abstract statistical coefficients to concrete, actionable knowledge about the strategic importance of the variables in our model. Table 4.21 presents the effect size (f^2) estimates for the key relationships in this study.

Table 4.21: Effect Size (f^2) of the Exogenous Constructs.

Path	f-square	Effect Size
Enterprise Digitalization -> Competitive Advantage	1.031	High
Enterprise Digitalization -> Innovation	1.045	High
Innovation -> Competitive Advantage	0.214	Medium

Detailed Interpretation of Effect Sizes

The relative power of the constructs in the model is presented in Table 4.21 in a very interesting way. Not just numbers: effect sizes are measurable levels of impact that can be directly translated into strategic priorities for SMEs.

1. The Dominant Role of Enterprise Digitalization

The strongest result is the enormous effect size of Enterprise Digitalization on both endogenous constructs.

- Enterprise Digitalization -> Competitive Advantage ($f^2 = 1.031$): A 1.031 effect size is not “large”, but it is more than three times greater than a high effect (0.35). This is a very deep discovery in real life. It shows that Enterprise Digitalization is not among the factors that cause the competitive advantage; it is the major, prevailing factor. In the case of the SMEs used in this paper, the scope of their digital adoption and strategy describes a significant share of the reason why certain firms perform better than others. This f^2 value implies that the payoff from investments in digitalization is gigantic in terms of market position, profitability, and brand strength. To a manager, this sends a clear signal that digital transformation is not a fringe exercise but a

central strategic necessity for survival and growth. This, as a policymaker, provides strong evidence that investing in digital infrastructure, digital literacy initiatives, and incentives for SMEs to implement digital technologies has a direct and significant effect on the competitiveness of the whole economy.

- Enterprise Digitalization -> Innovation ($f^2 = 1.045$): On the same note, the impact of Enterprise Digitalization on Innovation has an effect size of 1.045, which is very high. This observation reinvents the nature of digitalization among SMEs. It shows that digital tools are not only tools for operational efficiency but also potent generators of innovation. The implementation of e-business solutions, data analytics, and AI-based marketing fundamentally transforms an organization's ability to create new ideas, products, and processes. The magnitude of this effect justifies the thesis that innovation in the contemporary economy is increasingly digital. It suggests that a firm's innovative output is a direct precondition for its digital maturity. This is a strategic move, as the SMEs do not consider their IT budget a cost centre but rather an investment in their future innovative capacity.

2. The Meaningful Contribution of Innovation

- Innovation -> Competitive Advantage ($f^2 = 0.214$): The effect size for the Innovation -> Competitive Advantage relationship is 0.214, which qualifies as a medium effect size. Although it is not as significant as the direct impact of Enterprise Digitalization, this is a valuable discovery. The medium effect size means that Innovation is a significant and concrete factor of competitive performance. It corroborates the main assumption of Schumpeter's theory and the main hypothesis of the current study: the innovations that emerge from the process of digitalization themselves constitute a valuable resource that enhances a firm's market position.

This medium-sized effect may be interpreted within the framework of a mediation model. As revealed in the previous analysis, Enterprise Digitalization positively influences Competitive Advantage directly ($\beta = 0.778$) and indirectly ($\beta = 0.207$). The medium f^2 of Innovation is used to measure the weight of such an indirect route. It informs us that the immediate advantages of digitalization (e.g., cost savings, market penetration) are enormous, but the benefits of innovation are also an essential cog in the machine. It is the engine that helps firms to produce value that cannot be replicated. To managers, this highlights the need not simply to apply technology, but to cultivate a culture in which

the technology is used to experiment, create, and differentiate. It justifies investment in R&D, innovative talent, and operations that promote the generation of new ideas.

Synthesis and Strategic Implications

Taken together, these effect sizes paint a vivid, strong picture. The model's explanatory power is not only statistically significant but also practically strong. The story is as follows: Enterprise Digitalization is a potent engine, both directly contributing to competitive advantage and driving the innovation process. The said Innovation, in turn, is a complex transmission system that converts the engine's power into a specific and tactical improvement in competitive advantage.

The results of this combined study highlight the significant and indispensable role of Enterprise Digitalization in fostering innovation and competitive advantage, with innovation at one level serving as a significant contributor. The effect size analysis converts the statistical model into a strategic roadmap, demonstrating that the identified relationships are not mere academic novelties but potent forces with considerable practical implications for SMEs eager to survive in the digital economy.

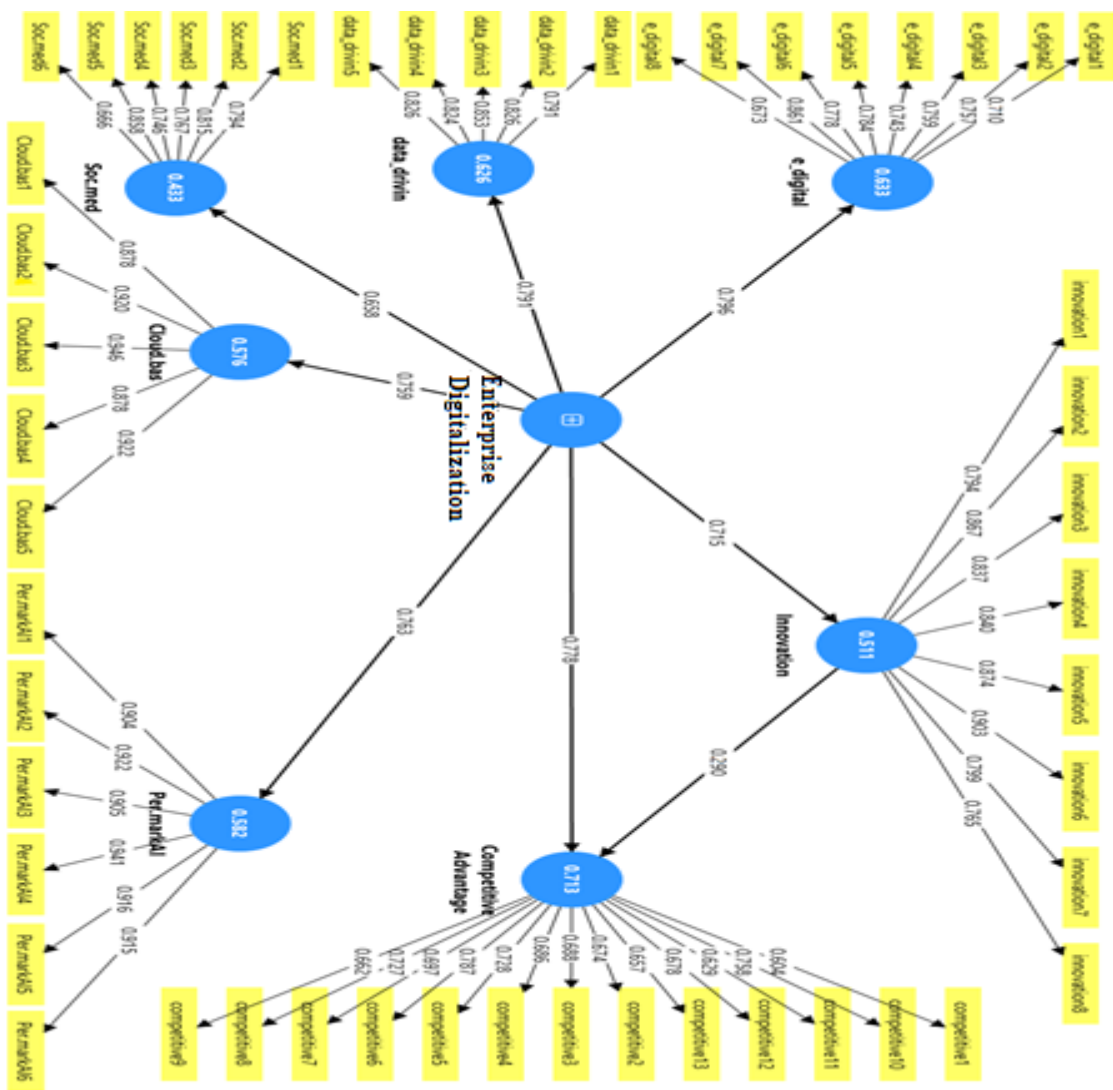


Figure 4.6: A Structural Equation Modeling (SEM).

4.7 Summary of Hypothesis

Table 4.22 presents the outcome of hypothesis tests in this research. Each of the hypotheses was proven, and it can be concluded that Enterprise Digitalization and its main dimensions, E-business optimization, data-driven decision making, social media engagement, cloud-based collaboration, and individual marketing with AI have a positive impact on the innovation and competitive advantage of SMEs. Moreover, innovation was recognized as playing an important role in increasing competitive advantage and mediating between Enterprise Digitalization and competitive advantage. Those findings

indicate the significant role of Enterprise Digitalization and innovation in enhancing SMEs' competitive edge.

Table 4.22: Summary of Hypothesis Testing Results.

hypo. No.	Hypothesis	Decision
H1	There is a positive impact of Enterprise Digitalization on competitive advantage in SMEs.	Support
H1.1	There is a positive impact of E-Business Optimization on competitive advantage in SMEs.	Support
H1.2	There is a positive impact of Data-Driven Decision Making on competitive advantage in SMEs.	Support
H1.3	There is a positive impact of Social Media Engagement for Customer Service on competitive advantage in SMEs.	Support
H1.4	There is a positive impact of Cloud-Based Collaboration on competitive advantage in SMEs.	Support
H1.5	There is a positive impact of Personalized Marketing with AI on competitive advantage in SMEs.	Support
H2:	There is a positive impact of Enterprise Digitalization on innovation in SMEs.	Support
H2.1	There is a positive impact of E-Business Optimization on innovation in SMEs.	Support
H2.2	There is a positive impact of Data-Driven Decision Making on innovation in SMEs.	not Support
H2.3	There is a positive impact of Social Media Engagement for Customer Service on innovation in SMEs.	Support
H2.4	There is a positive impact of Cloud-Based Collaboration on innovation in SMEs.	not Support
H2.5	There is a positive impact of Personalized Marketing with AI on innovation in SMEs.	not Support
H3	There is a positive impact of innovation on competitive advantage in SMEs.	Support
H4	There is a mediating role of innovation in the impact of Enterprise Digitalization on competitive advantage in SMEs.	Support

The findings of the study indicate some support for the hypotheses. All H1 and (H1.1)-(H1.5) were supported, which means that Enterprise Digitalization and its main elements, E-business optimization, data-driven decision making, social media engagement, cloud-based collaboration, and personalized marketing with AI have a significant positive impact on the creation of the competitive advantage of SMEs. In H2, the overall hypothesis was accepted, but not all of the sub-dimensions had a positive impact on innovation. In particular, the optimization of e-business (H2.1) and the use of social media (H2.3) influenced innovation significantly, and data-driven decision making (H2.2), cloud-based collaboration (H2.4), and personalized marketing using AI (H2.5) did not have significant effects. In addition, H3 was supported, confirming that innovation is an essential factor in enhancing competitive advantage. Lastly, H4 was also confirmed, showing that innovation mediates the relationship between Enterprise Digitalization and competitive advantage. In general, these results highlight that although Enterprise

Digitalization has a positive effect on SME competitiveness, only some dimensions directly contribute to innovation, which is why it is crucial to focus on the most effective digital strategies.

Chapter Five: Discussion of Results and Recommendations

5.1 Introduction

This chapter presents the study's results in accordance with the questions and hypotheses posed at the beginning. The researcher also associates these findings with the objectives of the study, the theoretical framework, and past studies, specifically similar studies at the local level. The researcher further gives an overview of these findings through two primary lenses; Theoretical interpretation: Theoretical interpretation focuses on how the results fit in with the fundamental scientific theories and concepts; Practical Interpretation: The practical interpretation is concerned with the application of the findings in the real-life context, that is, small and medium-sized enterprises (SMEs) and their effects on the decision-makers.

The chapter also includes a description of the extent to which the study's objectives were achieved, a list of the most significant limitations encountered, and recommendations to improve practices related to enterprise digitization and innovation. It also provides some guidelines for future research and concludes with an overview of the research findings.

5.2 Discussion of the Results

The purpose of this chapter is to analyze the statistical findings achieved in terms of the theoretical framework and previous research. They are discussed after the presentation of the results in Chapter Four to elucidate their scientific and practical consequences and to reveal their consistency or inconsistency with the past literature. It also provides contextual considerations that might have contributed to the outcomes, especially in the SME sector in Palestine.

The discussion is devoted to testing the main and sub-hypotheses, namely the effect of the institutional digital transformation on competitive advantage and innovation, and the role of innovation as a mediating variable in reinforcing this relationship. It is achieved by introducing each finding and connecting it to the corresponding theories, e.g., the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and the Innovation Theory proposed by Schumpeter. What is more, the outcomes are contrasted

with the past Arab and international research, with the key areas of agreement and dissent demonstrated.

The subsequent discussion of the results is therefore based on sub-themes which deal with the research hypotheses sequentially, beginning with the effects of institutional digital transformation on competitive advantage, then its effects on innovation, then the effect of innovation on competitive advantage, and finally the mediating role that innovation plays between the relationship between digital transformation and competitive advantage.

5.2.1 The Impact of Enterprise Digitalization on Competitive Advantage (RQ1/H1)

Findings from this research indicated that Enterprise Digitalization is one of the major factors in increasing SMEs' competitive advantage and has a significant positive influence. This shows that organizations that embrace digital tools can be in a better position to strengthen their market position and compete more effectively with rivals. This finding is theoretically in line with the Resource-Based View (RBV) of Barney (1991), which states that uncommon and valuable internal resources, such as digital capabilities, are strategic resources that are hard to replicate, providing the organization with a qualitative advantage. The findings also go to justify Schumpeter's theory of innovation, which states that the advent of technology and constant innovation create new paths of growth and competitive advantage. Moreover, the interpretation aligns with the Dynamic Capabilities Theory (DCT) by Teece, D. J., Pisano, G., and Shuen, A. (1997), which states that digitalization enables organizations to respond quickly to changes and capitalize on opportunities in unstable markets. In light of the Social Exchange Theory (SET), Blau (1964), online communication with customers and partners can be interpreted as an exchange of trust for mutual benefit, thereby boosting innovation and competitiveness.

Theoretically, the findings can be used to support the validity of the RBV theory in the Palestinian SME context, where digital capabilities have been found to be a useful strategic resource despite local companies' limitations, including limited financial resources, infrastructure constraints, and political instability. Nonetheless, it was also found that not all dimensions had a distinct impact, e.g., AI marketing or cloud collaboration, indicating that theoretical frameworks developed in developed economies

may need adjustment when implemented in Palestine. This points to differences in the degree of technology adoption and organizational preparedness depending on context, underscoring the need for a flexible theoretical approach that takes into account the individual economic, social, and political environments of Palestinian SMEs.

Building on the research of others, The study find that the findings of this research are similar to those of Ngugi and Karanja (2019) and Kraus et al. (2019, 2021, 2023), i.e., digitization is not a technical device but a strategic change process that transforms business models. They also share the same points as Tülüce and Yurtkur (2015) and Nambisan et al. (2019), who found that digitization helps increase innovation and create opportunities to develop new products and markets. At the competitive advantage level, Guo and Chen (2022) and Wang and Ma (2024) found that cloud computing, analytics, and artificial intelligence have become critical sources of contemporary competitive advantage. The study's findings in the local context corroborate those of Alkharabsheh and Al-Sarayreh (2022), who found that innovation, coupled with digitization, offers an added value to an organization and is not easily emulated, thereby increasing the competitive edge of Palestinian institutions.

Conversely, this paper's findings contradict Vial's (2021) argument that digital transformation may not consistently improve competitive advantage unless internal cultural and organizational change facilitates the adoption of technological innovations. Other studies, such as those conducted by Elia et al. (2020) and Beliaeva et al. (2020), also showed that the real character of digitalization is dependent on the environment of innovation and the ecosystem underpinning it, i.e., it is not what digitalization can bring to an organization that can lead to the creation of sustained competitive advantage.

From a different perspective, Edeh et al. (2020) and Castillo et al. (2022) suggested that in developing settings, SMEs can face challenges in translating digitization into a competitive advantage due to limited financial, technological, and human resources. Similarly, research by Brunetti et al. (2020) and Gupta et al. (2023) identified weak digital skills and a lack of trust in modern technologies as factors that can diminish the influence of certain aspects of the digital dimension, such as cloud collaboration or marketing artificial intelligence. This overlaps with what this paper suggested about the differing effects of a certain subset of digital transformation. These distinctions indicate that the effect of digitalization is not universal or consistent, except that it is correlated with the

extent of organizational preparedness, technical infrastructure, and the level of technology adoption. This demands that the contextual specificity be considered in interpreting results in developing countries like Palestine.

5.2.1.1 Discussion of the results of the sub-questions of the first question (H1.1–H1.5)

The results of the study showed that the dimensions of Enterprise Digitalization differ in their intensity of effect on SMEs' competitive advantage. Cloud collaboration (H1.4) was identified as the most impactful, as it contributes to team coordination, timely responses to changes, and reduced infrastructure expenses. This is in line with the Dynamic Capabilities Theory (DCT), which explains that organizations must be flexible and constantly reorganize their resources to adapt to changes in the business environment. It also concurs with Ngugi and Karanja (2019) and Kraus et al. (2021), who stated that digitalization transforms business models and helps businesses become more competitive.

In the H1.2 data-driven decisions, the result ($\beta = 0.310$, $t = 7.382$, $p < 0.001$) was relatively strong, proving that analytics and the use of data help make more precise and faster decisions. This validates the Resource-Based View (RBV), which holds that data and analytics are strategic assets that are hard to copy. This finding aligns with Guo and Chen (2022) regarding the contribution of digital analytics to improving contemporary competitive advantage. Nonetheless, it also demonstrates the local difficulties, with Palestinian organizations having to conduct data analysis to understand this dimension better.

On the other dimensions, i.e., social media engagement (H1.3), AI-driven marketing (H1.5), and e-business optimization (H1.1), they all also had positive effects. They were statistically significant, although the effect sizes (0.105-0.135) were lower. This is because such digital tools are still immature in the SME environment. Using social media interaction as an example, it helps improve customer service and increase loyalty, which can be explained through the framework of the Social Exchange Theory (SET), in which digital communication represents one of the types of exchange, founded on trust and benefit. Regarding AI-based personalized marketing, its poor performance indicates that the application of AI in small businesses has yet to be achieved, as it demands simpler, less expensive solutions that fit its means.

These findings clearly suggest that organizations that invest in cloud infrastructure and data utilization are in the best position to attain a robust competitive advantage, while other tools are yet to be integrated and more widely utilized. This highlights the fact that, as Vial (2021) points out, digital transformation does not consist solely of implementing tools; it should also be accompanied by the establishment of an organizational culture that facilitates learning and innovation.

Despite the findings indicating that Enterprise Digitalization and corporate digital transformation contribute to increased innovation and competitive advantage among SMEs, the present research also reveals specific differences and conflicts with earlier research. The research indicated that dimensions such as cloud collaboration and data-driven decision-making produced a definite positive effect on competitive advantage. In contrast, the other dimensions, including personalized marketing enabled by artificial intelligence and interaction through social media, did not have a significant effect on innovation in the sample under study. This is unlike the findings of earlier research, which highlighted the direct contribution of these digital tools to boosting innovation and competitiveness (Saputra et al., 2024; Al Koliby et al., 2024; Shehadeh et al., 2023).

The research findings also show that the influence of certain dimensions of digitalization depends on an organization's maturity, its digital infrastructure, and its organizational culture. Though in other studies, the conceptualization of the general positive influence of the digital transformation on the situation and the human resources available to the institution was considered in general without references to the specific institutional environment and the level of available human resources (Vial, 2021; Elia et al., 2020; Beliaeva et al., 2020). Moreover, the findings revealed that innovation serves as a mediating variable, partially explaining the relationship between digitalization and competitive advantage. Some past researchers have suppressed the idea that digital transformation has a direct and complete effect on innovation and have not considered the resource constraints of practice and the degree of technical maturity of organizations (Kraus et al., 2019, 2021, 2023).

These variations indicate that the success of digital transformation is not universal and that it can improve innovation and competitive advantage, depending on the organizational environment, employee capacity levels, and the maturity of the digital infrastructure. These differences could be attributed to a number of factors in the

Palestinian setting, including limited financial resources, issues with the economic and political environment, and no established digital infrastructure, which complicates the full realisation of the digital transformation for SMEs. This provides a more realistic perspective and imposes constraints on digital applications, in contrast to earlier research.

5.2.2 The Impact of Enterprise Digitalization on Innovation (RQ2/H2)

The research findings indicated that the Enterprise Digitalization is significantly and positively correlated with the degree of innovation in SMEs, meaning that approximately 50 percent of the dynamics in the innovation can be attributed to the adoption of digital practices. This indicates how digitization is closely related to an organization's capacity to innovate in developing its products and services.

Enterprise Digitalization was identified as a strategic new requirement rather than a second choice for SMEs. It not only enhances performance and reduces costs, but also creates a culture of sustainable innovation that can respond to the demands of a highly volatile market. Thus, the researcher highlights the necessity of governmental support for such organizations and for digital infrastructure at large, as well as the need to train employees to make the most of digital tools by promoting innovation.

Theoretically, this result is in line with the Resource-Based View (RBV) theory (Barney, J., 1991), which asserts that having rare and valuable resources, including digital capabilities, is one of the most important pillars of increasing competitiveness. Digital capabilities are strategic resources, regardless of e-commerce systems, data analytics, or cloud computing, which are hard to replicate and provide an organization with a lasting innovative edge. These results also align with Schumpeter's (1934) innovation theory, which argues that economic growth and competitive advantage depend primarily on innovation.

When we compare this finding with past findings, we find high levels of consistency. According to Ngugi and Karanja (2019) and Kraus et al. (2021), digitalization is one of the driving forces that contribute to increasing innovation levels and creating more resilient competitive strategies. Moradi et al. (2021) and Saunila (2016) also noted that an innovation culture facilitated by digitalization will help increase resourcefulness in organizations despite limited resources. Besides that, the importance of technological and non-technological innovation is evident, as the Oslo Manual (2018)

classifies it under the terms innovation (product, process, marketing, organizational). That is why certain dimensions of Enterprise Digitalization could be more effective than others; some are directly related to product and process innovation, while others are more mature or require more resources to demonstrate their influence.

Conversely, the paper revealed that not all aspects of digitalization, including data-informed decision-making, cloud collaboration, and individual marketing with artificial intelligence, had a substantial effect on innovation. This is contrary to research showing that such digital tools are direct drivers of innovation and organizational excellence (Saputra et al., 2024; Al Koliby et al., 2024; Shehadeh et al., 2023). It was also found that the success of digitalization is determined to a great extent by the existence of a robust digital infrastructure and an organizational culture that encourages innovation. Specific past research has focused on the direct benefits of digital transformation regardless of an organization's maturity or the human resources at its disposal (Vial, 2021; Elia et al., 2020; Beliaeva et al., 2020).

In addition, the article revealed that the effects of certain dimensions of digitalization on innovation can be partial or indirect. In contrast, other researchers presupposed a direct, overall effect of all digitalization tools on innovation (Kraus et al., 2019, 2021, 2023). These results show that the success of digital transformation does not necessarily depend on the situation; rather, it depends on the organizational environment and the resources at hand.

The Palestinian situation can be attributed to a few local issues, including the scarcity of financial and technical assets of small and medium-sized businesses (SMEs), the inability to have a high-tech digital infrastructure in certain regions, and the economic and political factors that may limit the capability of organizations to completely and efficiently use and apply digitalization tools. This shows that the Palestinian setting was important in achieving these contradictory findings and introduces a realistic, constrained perspective on the effects of digitalization on innovation, distinct from earlier studies.

5.2.2.1 Discussion of the results of the sub-questions of the second question (H2.1–H1.5)

The results of the study demonstrated that the influence of corporate digital transformation (H2.1) on innovation is strong and positive ($b = 0.466$, $p < 0.001$),

indicating that digitalization plays a key role in restructuring corporate strategies and increasing their competitiveness. This is theoretically aligned with the Resource-Based View (RBV), according to which digitalization can be viewed as a strategic resource, hard to copy, and providing long-term competitive advantage. In practice, it indicates that SMEs need to invest in digital solutions to become more efficient in their operations and minimize expenses.

Regarding social media interaction (H2.3), the impact was moderate and positive on innovation ($= 0.293$, $p = 0.001$). This finding is consistent with the Social Exchange Theory (SET), which argues that relationships are established on the basis of trust and mutual good. In practice, it implies the need to strengthen companies' presence on the digital platform to build better relationships with customers and achieve greater satisfaction and loyalty.

Conversely, other dimensions, including data-driven decisions (H2.2), cloud collaboration (H2.4), and personalized marketing with the help of artificial intelligence (H2.5), had no significant effect on innovation ($p > 0.05$). In theory, this can be an indicator of poor digital infrastructure or a poor organizational culture that underpins these tools. In practice, it will involve training employees in data analysis, infrastructure to support cloud computing, and the adoption of simplified digital marketing platforms within organizations' capacity.

In the study of the role of e-business optimization, the findings revealed a strong effect on competitive advantage, in line with research reports that e-commerce increases the customer base and opens new avenues. In theory, this discovery can endorse the notion that online platforms are a crucial avenue of expansion. In practice, it encourages businesses to build their websites and improve the speed and efficiency of their services.

Regarding innovation as an independent variable, it positively affected competitive advantage, in line with Schumpeter's theory, which views innovation as a major force driving a company toward growth and competitiveness. In a practical sense, it implies that companies need to treat innovation as a strategic alternative to enhance their competitive positioning, rather than a secondary tool.

Lastly, the findings indicated that innovation partially mediates the relationship between enterprise digitization and competitive advantage, i.e., it accounts for a

significant fraction of the relationship but is not the only variable. In theory, this creates the opportunity to include other variables, such as digitization or human resources, in the models to come. In practice, it validates the idea that innovation has to be nurtured by an environment comprising government policies, infrastructure, and a corporate culture that promotes change and innovation.

Some previous studies suggest results that may partially contradict this conclusion. While studies such as Ngugi & Karanja, 2019; Kraus et al., 2019, 2021, 2023 confirmed that institutional digital transformation clearly enhances the competitiveness of SMEs through a comprehensive restructuring of the strategic model, the results of the current study showed that innovation was not the complete mediator in enhancing competitive advantage, particularly in some digital dimensions such as data-driven decision-making, cloud collaboration, and personalized marketing using artificial intelligence, which had no significant impact on innovation ($p > 0.05$). This paradox implies that SMEs in the Palestinian context may be constrained by a lack of digital infrastructure or by a low organizational culture that favors the use of the most advanced digital transformation tools. This partly aligns with Vial's (2021) remarks on the significance of organizational culture rather than technical adoption.

Other literature, including Tülüce et al. (2015) and Saputra et al. (2024), has demonstrated that digitalization improves product and service development and facilitates access to new markets, which the present research has not fully reflected. This indicates that digital innovation in certain organizations is still at a stage where it cannot be fully applied to achieve a complete competitive advantage. Moreover, although Schumpeter (1934) and Edeh et al. (2020) posit that innovation is a central factor in economic development and competitive advantage, the present research indicates that innovation cannot confer competitive advantage in SMEs without combined strategic facilitation, such as digital transformation and technological infrastructure.

Regarding competitive advantage, researchers have affirmed that a high competitive advantage is achieved through the optimal utilization of technical, financial, and organizational resources (Laszlo and Zhexembayeva, 2017; Desfifrina et al., 2019; Uddin et al., 2023). The present study, however, demonstrated that innovation alone can fully deliver this benefit only when combined with extensive digital policies and a robust

infrastructure, and partially opposes previous research that has firmly linked innovation and digital transformation to a competitive advantage.

5.2.3 The Impact of Innovation on Competitive Advantage (RQ3/H3)

The study's findings indicated that the influence of innovation on competitive advantage in SMEs is positive and moderate, as innovation greatly enhances the organizational capacity to differentiate itself in the market. This result is also consistent with the study's aims, which sought to determine which innovation serves as a means of augmenting efficiency and enhancing products and services in organizations.

Innovation in the Palestinian context is one of the complementary aspects of increasing competitive advantage, but it is not the only one. Innovation and holistic digital strategies, such as cloud computing, data analytics, and digital collaboration, should be incorporated into SMEs. In a practical context, this implies that investing in innovation would not be enough; rather, it would be part of a complex system of digital tools to make the maximum contribution to competitive performance, secure a sustainable advantage, and reach market excellence.

In theory, these findings can support Schumpeter's (1934) theory of innovation, which sees innovation as the major driving force of economic development and competitive advantage. It is also in line with the Resource-Based View (RBV) of the firm (Barney, 1991), which holds that pivotal and rare resources within an organization, i.e., digital capabilities and organizational knowledge, are the foundation for increasing competitive performance. The relevance of organisations' ability to constantly respond to changes and take advantage of new opportunities is also supported by the Dynamic Capabilities Theory (DCT; Teece et al., 1997), and thus, innovation becomes an essential component of a strategy to develop a competitive advantage.

Comparing the results with previous studies, we see that international high-quality studies have concluded that innovation enhances the quality of products and services and makes organizational operations more efficient (Hanafi et al., 2017; Novita and Husna, 2020). The findings also align with local research indicating that small and medium-sized enterprises (SMEs) in Palestine face challenges in fully adopting innovation, which limits their effectiveness when not supported by modern digital tools. According to recent research, technological and organizational innovation may also serve as an intermediary

between digitalization and improved competitive performance (Kraus et al., 2022; Vial, 2021).

Conversely, a few past studies show findings that, to some degree, contradict this conclusion. Although studies such as Ngugi and Karanja (2019) and Kraus et al. (2019, 2021, 2023) have already proved that a drastic change of the strategic model of the organization has a high competitive advantage as a result of institutional digital transformation, the findings of the current study have revealed that the role of innovation as a mediator is relatively moderate. This indicates that small and medium-sized enterprises (SMEs) in the Palestinian context may be limited in their ability to fully adopt the digital transformation process, whether due to a lack of necessary resources or a weak organizational culture that would positively impact innovation. This is in line with some of Vial's (2021) findings on the need for a robust organizational culture, rather than merely acquiring digital tools.

There are also studies indicating that SMEs can achieve tangible innovation despite the lack of digital infrastructure or the wholesale adoption of digital transformation (Edeh et al., 2020; Castillo et al., 2022), which does not fully support the hypothesis that digitalization will be a massive boost to innovation. Further, as noted in articles such as Tülüce and Yurtkur (2015) and Saputra et al. (2024), digitization should be combined with the processes of product and service development and entering a new market, which, in the current research, did not demonstrate its full effectiveness. This shows that a full-scale competitive advantage cannot be obtained through innovation or partial digital transformation.

Regarding competitive advantage, Laszlo and Zhexembayeva (2017); Desfitrina et al. (2019); and Uddin et al. (2023) have demonstrated that high competitive advantage is achieved through the optimal utilization of technical, financial, and organizational resources, which is not entirely present in the case of Palestinian SMEs. Hence, the mediation of innovation in this case is part. Guo and Chen (2022) and Wang and Ma (2024) also stressed that one of the main sources of the contemporary competitive advantage is digital transformation, including cloud computing and artificial intelligence. This has not been fully exploited in the present study, thereby underestimating the overall impact of innovation.

Therefore, although innovation can play the role of a mediator in the mutual strengthening of the relationship between digital transformation and competitive advantage, the results of the study partially contradict some of the previous studies, which have firmly linked digital transformation and innovation to competitive advantage, and the significance of organizational culture, the assimilation of digital tools, and the investment of technical and human resources in order to achieve a real and sustainable competitive advantage.

5.2.4 The Mediating Role of Innovation (RQ4/H4)

The mediation analysis revealed that the indirect effect of Enterprise Digitalization on competitive advantage is significant, with innovation partially mediating the relationship (Enterprise Digitalization - Innovation - Competitive Advantage: $b = 0.207$, $t = 3.39$, $p = 0.008$). It implies that Enterprise Digitalization benefits competitive advantage both directly and indirectly through increased innovation, indicating two directions: a direct one towards better efficiency and operations, and an indirect one focused on innovation to improve performance in the medium term.

The innovation in this respect is one of the major elements of competitive advantage, though it is not the only determinant. SMEs should implement an integrated digital policy that enhances day-to-day operations and leverages innovation potential. This, in practice, implies that companies' investments in innovation should be accompanied by the development of digital infrastructure, including cloud computing and data analytics, to achieve sustainable strategic outcomes and reinforce their competitive advantage in the market.

Theoretically, the findings can be related to Schumpeter's (1934) innovation theory, which considers innovation as the main driver of economic growth and competitive advantage. They also fit within the resource-based view (RBV) of the firm (Barney, 1991), which clarifies that digital assets and exploitable internal capabilities are strategic resources that are hard to replicate and contribute to competitive performance. Moreover, the dynamic capabilities theory (DCT - Teece et al., 1997) emphasizes the importance of organizations being able to sense opportunities and continually reconfigure resources to become innovative and remain competitive. The social exchange theory (Homans, 1958) describes the creation of an environment of two-way exchange between the organization

and the customer due to digitalization, which contributes to collaboration and innovation and results in competitive advantage.

In line with these results and other past studies, we can attest that international studies have shown that innovation is a mediator between digitalization and enhanced competitive performance (Kraus et al., 2022; Nambisan et al., 2019). It has also been revealed in local and international research that small and medium-sized enterprises (SMEs) are capable of attaining a higher competitive advantage when they integrate innovation with the digital analytics tools, cloud computing, and digital marketing (Ngugi and Karanja, 2019; Vial, 2021; Saputra et al., 2024). This shows that innovation is not a unidirectional process, but it is reinforced by strategic and technical processes to ensure its effects on competitive advantage are felt.

Nevertheless, other past researches demonstrate factors that partially contradict these results. For example, studies such as Edeh et al. (2020) and Castillo et al. (2022) have shown that SMEs can achieve innovation and competitive advantage despite limited digital infrastructure, suggesting that innovation can support competitive performance without necessarily requiring full backing from digital transformation. Besides, certain essential aspects of digital transformation, including data-based decision-making, cloud-based teamwork, and AI-based personalized marketing (Vial, 2021; Kraus et al., 2021; Razak et al., 2024), can have a more direct influence on innovation, as it is indicated in some other international research; however, it was not influential to the extent of the present study.

Despite the findings of the present research showing that Enterprise Digitalization and corporate digital transformation contribute to innovation and competitive advantage in SMEs, there are certain inconsistencies with previous research. The analysis has shown that dimensions such as cloud collaboration and data-based decision-making positively influence competitive advantage, with a high level of clarity, and that other dimensions, such as personalized marketing with the assistance of artificial intelligence and social media communication, did not demonstrate a significant impact on innovation. It is contrary to the study, which found that the discussed digital tools are first-order sources of innovation and organizational excellence (Saputra et al., 2024; Al Koliby et al., 2024; Shehadeh et al., 2023).

The study also observed that the organization's maturity, the presence of specific digital infrastructure, and the organization's culture of innovation are key determinants of the success of the digitalization process. However, the existing literature has focused on the benefits of digital transformation at the moment, regardless of organizational context and human resource supply (Vial, 2021; Elia et al., 2020; Beliaeva et al., 2020). In addition, the findings indicated that some dimensions of digitalization might have partial or indirect effects on innovation. In contrast, other articles have postulated a direct, holistic effect of all digital tools on innovation (Kraus et al., 2019, 2021, 2023).

There are several local factors that are significant in explaining these disparities in the Palestinian context. To start with, small and medium-sized enterprises (SMEs) do not always have access to the funds and technological resources needed to embrace modern digital tools fully. Second, not all locations have underdeveloped or unavailable digital infrastructure, which is an obstacle to implementing solutions such as cloud computing and state-of-the-art digital marketing. Third, economic and political issues in Palestine influence business stability and the possibility of investing in modern technology, which complicates the realization of digitalization compared to developed countries.

In addition, the works of Schivinski et al. (2016), Pentina et al. (2018), and others identified social media interaction as a direct trigger of collaborative innovation, and the current research demonstrated a moderate effect. This indicates a lack of consistency between theory and practice in the Palestinian context, where innovation alone is not enough to achieve a tangible competitive advantage. The current findings state that an innovation-friendly environment with powerful digital infrastructure and a supply of skilled human resources are necessary conditions for achieving the actual impact of digitalization on innovation and competitive advantage.

In this connection, it can be stated that digital transformation is not an objective and homogeneous process. Instead, it is successful based on the situation within an organization and available resources. This provides a realistic and practical perspective on the impact of digitalization on innovation, rather than previous studies in developed nations. It also emphasizes the need to consider local specificities when designing digital transformation strategies for Palestinian organizations, with priorities to build a digital infrastructure, develop an innovation culture, and train employees to make the most of digital tools.

5.3 Summary of Findings and Study Objectives

This study aimed to understand the connection between digital transformation, innovation, and competitive advantage in small and medium-sized enterprises (SMEs), and the impact of innovation as an intermediary between Enterprise Digitalization and competitive advantage. The objectives of the study showed the following:

The first one: To quantify the effect of Enterprise Digitalization on innovation. The findings revealed that digital transformation is a clear way to increase organizational innovation capacity. This can be attributed to the resource theory that views digital assets as valuable and hard to copy. Practically, this implies that companies that employ digital transformation tools, i.e., digital analytics and cloud computing, are better positioned to enhance their innovation efforts and develop new products and services.

Examining the effects of the dimensions of digital transformation through a mediation pathway, it is clear that not all dimensions have equal effects on innovation, indicating the degree of mediating role in determining the relationship between digital transformation and competitive advantage. The findings revealed that the e-transformation dimension had the highest indirect effect through innovation, followed by interaction through social media. It means that an improved environment of innovation in Palestinian organizations is achieved by adopting electronic systems and opening interactive communication channels.

Other dimensions, including data-driven decisions, cloud collaboration, and AI-powered marketing, did not show a strong influence on innovation, thereby diluting their role in the indirect route to competitive advantage. This may be attributed to the slowness of the digital infrastructure of Palestinian companies, the lack of investment in sophisticated analytical tools, and the limited human resources to utilize these technologies in ways that enable them to be turned into innovative products or services.

Such a ranking indicates that innovation within the Palestinian context cannot emerge from thin air as a result of all the elements of the digital transformation. Instead, it is more dependent on visible, direct applications that are cheaper and easier to run, such as e-transformation and social interaction. In the meantime, higher-level dimensions (such as cloud analytics and artificial intelligence systems) require greater infrastructure

and organizational preparedness before they can have a tangible effect through innovation.

The second hypothesis: To examine how innovation affects competitive advantage. The findings revealed that innovation positively influences the competitive advantage, although it is not the sole factor. There are other variables, such as data and cloud analytics, that directly enhance performance in an organization. This is theoretically consistent with Schumpeter's view of innovation as a source of growth and competitive advantage. In practice, it implies that organizations should combine innovation with overall digital strategies to boost their performance in terms of competition.

The third goal: To test whether innovation can be perceived as a mediator between Enterprise Digitalization and competitive advantage. The findings showed that innovation does serve as a partial mediator; i.e., Enterprise Digitalization improves competitive advantage directly and indirectly via innovation. This aligns with the concept of dynamic capabilities, which holds that it is important to sense opportunities and reconfigure resources constantly. This, in practice, implies that digital transformation policies need to be directed at enhancing day-to-day operations and reinforcing innovation to deliver strategic outcomes in the medium term.

5.4 Limitations

Although the study found certain substantial findings on the role of digital transformation and innovation in promoting competitive advantage, we have faced a number of limitations that we need to mention. To begin with, the study relied solely on a quantitative method, using questionnaires to gather information, without a qualitative method that could have provided deeper insight into participants' experiences and elaborated on the phenomena in greater detail. In this regard, we suggest that forthcoming research be conducted through a synthesis of quantitative and qualitative methods, including in-depth interviews or focus groups, to offer an all-inclusive view of the inner workings and the manner in which innovation and digital transformation apply in practice.

Second, there are constraints regarding the sample. It is also small and might not fully represent SMEs across the various regions. Moreover, there are parts of Gaza that were not covered in the study. This can influence the extent to which the findings can be

generalized to other geographical settings. It is therefore hoped that future studies will expand the sample size to include other regions, in an effort to determine the impact of variables in other contexts, particularly those related to innovation capacity and the use of digital resources.

Third, it is limited to some extent by the variables; other essential variables, such as organizational culture, managers' flexibility, and human resource strategies, can impact innovation and competitive advantage but have received less attention in terms of measurement. That is why, in our view, the following research cycle must include these variables and investigate their impact on the correlation between digital transformation, innovation, and competitive advantage, to provide a more accurate and comprehensive picture.

5.5 Theoretical Implications

The results of the research are strong arguments that although the world management theories, such as the Social Exchange Theory (SET), the Resource-Based View (RBV), the Dynamic Capabilities Theory (DCT), and the theory of innovation developed by Schumpeter, can be applied to the Palestinian context, they are not transplantable. Instead, they acquire their explanatory power only when modified, localized, and reinterpreted in terms of local realities. The contribution of this study is to show how these strong theories can bend, flex, and reveal new sides when put to the test in a unique setting with certain constraints and resilience.

An example of such a theory is the Social Exchange Theory (SET), which assumes that the development of bilateral relationships based on trust and mutual benefit is the key to innovation. This theory is put to the test in the Palestinian context. In this case, when formal institutional backing may not be dependable, informal networks and mutual relationships may be the vein of business, which could assist SMEs in overcoming political unrest and financial turbulence. Digitalization, in theory, ought to vastly multiply these interactions and enable effortless knowledge sharing. Nevertheless, as we find, there is a significant caveat: the inefficiency of the online infrastructure grossly undermines the effectiveness of such digital partnerships. Power interruptions, bandwidth restrictions, and high connection fees set what appears to be a seamless digital interaction system into a disjointed and untrustworthy one. This “digital paradox”, or an increased demand for

digital connection under the weak infrastructure, is why hypotheses involving deep digital collaboration, such as Cloud-Based Collaboration (H2.4), have not necessarily been directly converted into innovation. This theoretical implication is that the “exchange” within the context of SET is not necessarily a social or economic one; within the developing contexts, it is also infrastructural.

Equally, the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) can be validated with appropriate adjustments. According to RBV, digitalization can help firms produce scarce, valuable, and inimitable resources. A clear, simple, and up-to-date customer database, or a strong presence on social media, can become a resource for the VRIN in Palestine, offering a competitive advantage that large, less agile firms cannot replicate. But DCT teaches us that having resources is not sufficient; firms need to possess dynamic capabilities that enable them to sense, seize, and reconfigure resources in response to environmental change. According to our study, the nature of “dynamic capabilities” differs in a limited environment. They are less proactive in shaping markets and more reactive in terms of survival and adaptation. The fact that Data-Driven Decision Making (H2.2) did not have a significant influence on innovation might suggest that SMEs are so preoccupied with the reconfiguration of resources on a daily basis to adapt to immediate challenges (e.g., a sudden border shutdown, currency variation) that they lack the bandwidth to use data to innovate proactively, in the long term. In this way, it is a continuation of the theory: first and foremost, dynamic capabilities under such circumstances are resilience capabilities.

Lastly, the findings of the research provide strong support for Schumpeter's theory and establish innovation as one of the strongest instruments for strengthening competitive advantage. Nonetheless, it undertones the most successful form of innovation. In Palestine, it is less about the “creative destruction” of Silicon Valley and more about what can be called constrained creation, or “frugal innovation”. It consists of getting by with what little one has to make as much as possible. This research confirms that such an innovation must be complemented by digital analytics and technical technologies. Yet, they are typically ready-to-buy and used in an ad hoc, inventive fashion. This is evidenced by the success of E-business Optimization (H2.1) and Social Media Engagement (H2.3) in driving innovation; these sites offer low-cost avenues for SMEs to experiment, engage their customers, and gradually add value to their offerings.

In this regard, this study provides an in-depth theoretical insight by recommending a paradigm shift in the application of these theories in developing contexts. It demonstrates that:

1. Digital innovation cannot be described as a one-size-fits-all process, as it is closely tied to the local socio-economic and infrastructural environment, and its success is directly proportional to it.
2. Digital resources are not necessarily good resources, but their benefits can be unlocked and enhanced only with the appropriate digital skills and access to funding, which can be in short supply.
3. The platforms do not dictate online interaction and collaboration, but the reliability of the underlying infrastructure and the cultural norms of communication shape the structure of Internet communication.
4. Dynamic capabilities are not something that can be assumed; they must be realistically reconfigured to function in resource-constrained, high-volatility environments, and they should be concerned with resilience and adaptability.

The work thus adds to the theoretical discussion by supporting a more varied, contextually situated understanding of these theories, rather than the normative, frequently Western-centric practice that views stable environments and ample resources.

Therefore, we highly recommend that researchers and policymakers become theoretical interpreters, integrating the local setting into international theories. Researchers ought to revise their hypotheses and operationalize variables in line with conditions on the ground, clearly including factors such as infrastructure reliability, political risk, and the availability of finance in their frameworks. To policymakers, this implies abandoning generic “digitalization” strategies. They need to develop specific interventions that take into account these facts: investing in resilient digital infrastructure as a public good, developing frugally innovative funding schemes, and building training programs that deliver highly pragmatic, adaptable digital skills rather than higher technical skills. Only by adapting theory to practice in this way can we unlock the true potential of Enterprise Digitalization for sustainable development in Palestine and similar contexts worldwide.

5.6 Recommendations

According to the findings of the study, it is possible to develop recommendations based on the beneficiary groups to provide the practical implementation and effective impact:

- It is recommended for Managers of Small and Medium Enterprises (SMEs).
 - Progressively embrace digital transformation by leveraging digital tools such as cloud computing, process automation, and digital analytics, based on capabilities.
 - Implement innovation across operations by fostering a creative workplace and establishing digital platforms to support product and service development.
 - Connect digital marketing and data analytics to make decisions more accurate and enhance competitive advantage.
 - Train workers in data analysis, innovation, and digital transformation management to ensure the successful use of technology.
 - Embrace partnerships with universities, accelerators, and business incubators to address inadequate technical infrastructure.
- Policymaker and Official Institution Recommendations.
 - Empower digital infrastructures in Palestine through high-speed internet and cloud computing facilities to SMEs.
 - The initiation of tax and financing incentives to enable the implementation of the digital transformation in companies with resource constraints.
 - Implement national digital training and innovation initiatives focused on production and service sector graduates and employees.
 - Promote the idea of a public-private partnership to accelerate digitization and the adoption of applied innovation.
 - Enact laws governing e-commerce, digital marketing, and artificial intelligence to boost confidence and create a clearer, more understandable digital investment climate.

- Research and Academic Recommendation.
 - Increase the research areas to other governorates (Gaza and rural) to learn about contextual differences.
 - Employ masterful approaches (both quantitative and qualitative) to reveal unspoken issues concerning the implementation of digital transformation and innovation.
 - Additional variables to be included in future models are organizational culture, technological preparedness, innovative leadership, and human resources.
 - Discover those dimensions that have not demonstrated a significant influence on the innovation, including AI-powered marketing and cloud collaboration, to clarify why they have been weak in Palestine.
 - Investigate a comparative analysis of Palestine with other developing nations to deepen understanding of the influence of local conditions on the success of digital transformation.

5.7 Conclusion

The study's outcomes show that digital transformation and innovation are essential levers for advancing competitive advantage for SMEs, and that innovation partially mediates the relationship between digitization and competitiveness. This implies that the digital transformation effect is realized in two key channels:

- The existence of a direct path that enhances operational process efficiency and improves daily performance.
- The pathway is indirect and helps promote innovation and build organizations' strategic capabilities in the long and medium term.

The findings also indicate that digitization should not be implemented automatically; it is connected to a regulatory environment and infrastructure that may facilitate the implementation of digital tools. This underscores the need for more detailed future research that considers the nature of the local setting, so as to guarantee the generalizability of the findings and the derivation of more precise, real-life, practical suggestions.

At the practical level, the study provides the business people and decision makers with direct messages:

- **Owners and Managers of Small and Medium Enterprises:** The results show that not only can the adoption of e-commerce and customer communication via online platforms contribute to efficiency and cost reduction, but new opportunities in new markets, customer satisfaction, and innovation are also possible through direct feedback. Electronic process improvement also increases speed in product development and operational flexibility.
- **Policymakers and Supporting Institutions:** The results imply a need to establish national digital infrastructure and to provide incentives and legislation that will promote the transition towards digital models. This would also entail enabling companies to embrace innovation by providing training, offering technical support, and creating a regulatory environment that enhances a smooth process. These are combined efforts that contribute to improving the national competitive advantage, alongside sustainable economic growth.

Overall, the study observes that digital transformation, as an investment object, cannot be regarded as an operational object but rather as a strategy to facilitate innovation, establish a sustainable competitive advantage, and increase companies' ability to adapt to future processes.

5.8 Limitations of the Study on Enterprise Digitalization and Competitive Advantage in SMEs

The results of the research eloquently demonstrate that global management theories such as Social Exchange Theory (SET), Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and the Schumpeterian notion of innovation are not merely issues that can be easily transplanted into the Palestinian context. Rather, their explanatory power is fully realized when they have been modified, refined, and reworked in light of local realities. The contribution of this study is thus to show how these strong theories are bent, flexed and open new dimensions when they are put to test within an environment that is defined by distinct constricts and a sense of resiliency- an environment of political instability, economic fragmentation and the lack of resources,

but also an environment of a strong entrepreneurial spirit and dependence on small fabric of sociality.

One such theory is the Social Exchange Theory (SET), which argues that mutual gain and trust between the parties are necessary for innovation. This theory is tested in the Palestinian situation. In this case, with institutional assistance erratic and business fluctuations constant, informal networks and mutual agreements are the blood of the business, enabling SMEs to thrive in political and economic uncertainty. In theory, digitalization should take these interactions to new heights, enabling smooth collaboration and knowledge sharing. But there is a fatal limitation to our results: the effectiveness of this online collaboration is hampered by the inadequacy of the online infrastructure. Periodic power outages, low bandwidth, and expensive data connections turn what would otherwise be a hassle-free digital transaction into a disjointed and unstable one.

The increased demand for digital connectivity, undermined by the lack of robust infrastructure, drives the so-called digital paradox, which is why propositions such as the Deep Digital Collaboration (H2.4) did not necessarily lead to innovation. The theoretical perspective is that the exchange in SET is not merely social or economic; in the developing context, it is also deeply infrastructural. Moreover, even the essence of trust is changed. Face-to-face communication and long-term reputation form the basis of trust in a physical marketplace. Applying this to a digital space, particularly one that suffers from connectivity problems and may have security concerns, necessitates a more conscious form of social exchange, dependent on digital reputation systems that are not yet fully developed.

Likewise, both the Resource-Based View (RBV) and the Dynamic Capabilities Theory (DCT) are also validated with essential amendments. According to the RBV, digitalization can help companies create scarce, valuable, and inimitable resources. A vulnerable, simple, and clean customer database or a strong social media presence in Palestine can actually turn into a VRIN resource, giving a competitive advantage that cannot be replicated by larger, less agile companies. Nevertheless, the technology is not the most important asset; human capital and cyber literacy are. According to our study, the skill of creativity in repurposing off-the-shelf digital tools, referred to as bricolage, is superior and more valuable than the availability of the tools themselves. DCT helps us

remember that having resources is not sufficient; companies need dynamic capabilities to feel, grasp, and shape them in response to environmental change. According to our study, in a limited setting, the nature of dynamic capabilities takes on a new form. They are not so much concerned with active market shaping as with survival and adaptation through reaction. The fact that the Data-Driven Decision Making (H2.2) did not have a meaningful effect on innovation could be a sign that SMEs are currently overwhelmed with the daily reorganization of resources in order to respond to immediate challenges (e.g., a sudden border closure, a currency fluctuation) that they have no strategic capacity to use data to generate proactive and long-term innovation. In this way, the theory is generalized, dynamic capabilities in this situation are initially capabilities of resilience, the ability to weather shocks and restructure resources in new forms to allow continuation.

Lastly, the research findings provide strong support for Schumpeter's theory, which establishes innovation as one of the most important means of competitive advantage. Nonetheless, it puts a twist on the most effective types of innovation. Innovation in the Palestinian context is not a process of creative destruction like that of Silicon Valley, but rather what might be described as constrained creation or frugal innovation. It is concerned with working with the little and producing the most. The research confirms that the innovation should be complemented by digital analytics and technical means, yet these tools are often off-the-shelf and used creatively and unintentionally. This is evident in the effectiveness of E-business Optimization (H2.1) and Social Media Engagement (H2.3) in promoting innovation, as these channels offer affordable, easy-to-use opportunities for SMEs to experiment, involve customers, and make minor adjustments to their products and services.

However, this kind of innovation, though it may appear insignificant, can build over time and enhance a strong, sustainable competitive advantage that is firmly embedded in knowledge and catering to a particular niche market. It is a customer-centered, bottom-up type of innovation that is the direct opposite of top-down, technology-push approaches common in the developed economies. In this regard, this paper has significant theoretical implications because it proposes a paradigm shift in the application of these theories in developing contexts. It demonstrates that:

1. Digital innovation is not a universal, one-size-fits-all process; its success is absolutely correlated with the local socio-economic and infrastructural context.

2. Digital resources alone are not valuable; their usefulness is unlocked and multiplied only when used in combination with the right digital skills and access to funds, which is not always available.
3. The aspects of online interaction and collaboration are not determined solely by platform design, but by the soundness of the underlying infrastructure and the cultural standards of communication.
4. Dynamic capabilities are not to be presumed; they must be realistically reconfigured to work in resource-constrained, highly volatile environments, with a greater focus on resilience and adaptability.

The contribution the work is making to the theoretical debate is thus to acknowledge a more relaxed, context-specifically defined version of these theories, and to depart from the normative, often Western-centric application that presupposes stable settings and plentiful resources. Therefore, we highly recommend that researchers and policymakers become so-called “translators of theory”; that is, they should incorporate the local context into the realm of international theories. To the researchers, this implies that it is time to look beyond cross-sectional surveys and adopt other approaches, such as longitudinal case studies and ethnographies, that can capture the dynamism and resilience of Palestinian SMEs over time. They need to revise their hypotheses and operationalize their variables given local circumstances, and explicitly include factors such as the reliability of infrastructure, political risk, access to finance, and the role of diaspora networks in their models. This implies that policy-makers should go beyond generic “digitalization” strategies. Their interventions have to be designed to address these realities: they need to invest in resilient digital infrastructure (e.g., community broadband, solar-powered data centers), they need to develop funding structures that are oriented towards frugal innovation (e.g. micro-grants to make something about a process go better), and they need to develop training programs that emphasize adaptive, practical digital skills over advanced technical knowledge. Moreover, encouraging the development of public-private partnerships to create “digital sandboxes” where SMEs can test new technologies in a risk-free setting may open the door to new types of innovation. It is only through such adaptation of theory to practice that the full potential of Enterprise Digitalization for sustainable development in Palestine and analogous situations worldwide can be unlocked.

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Appendix

Modifications Made to the Questionnaire Based on Experts' Feedback

Section / Item	Text in Initial Version	Suggested Modification by Reviewers	Text in Final Version
Questionnaire Title (English)	<i>The Impact of Enterprise Digitalization on Competitive Advantage...</i>	Revise the wording to make it clearer and more precise	<i>The Impact of Enterprise Digitalization and Competitive Advantage in SMEs: The Mediating Role of Innovation</i>
	The effect of <i>Enterprise Digitalization</i> on Competitive Advantage...	Replace “Enterprise Digitalization” with “ Enterprise digitalization ”	The effect of <i>Enterprise Digitalization</i> on Competitive Advantage...
Introduction	“...strategic Enterprise Digitalization affect...”	Simplify the wording and replace with the term <i>digitalization</i>	“...digitalization affect the achievement...”
Demographic Questions – Firm Size	Small (less than 100 employees) – Medium (100–350 employees)	Apply ILO classification and clarify it in the text	Note added: (<i>According to ILO... small ≤ 49 employees, medium ≤ 249 employees</i>)
Independent Variable (Source)	Ngugi & Karanja (2019)	Replace with a more recent and locally relevant source	Bazadough, S. J. (2024)
Independent Variable Name	Strategic Enterprise Digitalization	Revise to Enterprise digitalization to align with the thesis topic	Enterprise digitalization
Dependent Variable (Source)	Ngugi & Karanja (2019)	Replace with the most recent and approved source in the thesis	Bazadough, S. J. (2024)
References	Contained 8 sources (Ngugi, Fattah, Saputra, Xu, Amoah, Mansouri, Shehadeh, Al Koliby)	Update and add references + include ILO (2020) + Bazadough (2024)	Updated to 9 references including new and recent ones (ILO, Bazadough, etc.)

رقمنة المؤسسات والميزة التنافسية في المؤسسات الصغيرة والمتوسطة: الدور

الوسيط للابتكار

حنان حسن عبد الله نزال

لجنة المناقشة: د. محمد حدود، د. سمير أبو زنيد، د. جون ليبينسكي

الملخص

هدفت هذه الدراسة إلى تحليل أثر التحول الرقمي للمؤسسات على الميزة التنافسية للشركات الصغيرة والمتوسطة في فلسطين، مع التركيز على الدور الوسيط للابتكار. وقد انطلق هذا الهدف من تزايد الوعي بأهمية التقنيات الرقمية كعنصر محوري في تعزيز القدرة التنافسية للمؤسسات، في ظل محدودية الموارد، إلى جانب محدودية الدراسات التي تناولت الآليات الكامنة وراء توظيف هذه التقنيات بكفاءة في السياق الفلسطيني.

اعتمدت الدراسة المنهج الكمي بما يتلاءم مع أهداف البحث، حيث تم قياس المتغيرات الرئيسية، وهي التحول الرقمي والابتكار والميزة التنافسية، وفق مقاييس معتمدة، وتحليل البيانات باستخدام نمذجة المعادلات الهيكلية عبر برنامج Smart-PLS.

تمثلت وحدة التحليل في الشركات الصغيرة والمتوسطة العاملة في الضفة الغربية - فلسطين، حيث اعتُبرت المؤسسة وحدة تحليل مناسبة لدراسة العلاقات بين متغيرات الدراسة. وشملت العينة شركات صغيرة ومتوسطة تتبنى التحول الرقمي وتُدرج الابتكار كعنصر أساسي في استراتيجياتها. ولضمان الحصول على بيانات دقيقة وذات موثوقية عالية، تم جمع البيانات من مستجيبين رئيسيين يشغلون مناصب إدارية عليا في كل مؤسسة.

أظهرت نتائج الدراسة أن التحول الرقمي والابتكار يُعدان من العوامل الجوهرية في تعزيز الميزة التنافسية للشركات الصغيرة والمتوسطة، كما بينت النتائج أن الابتكار يؤدي دورًا وسيطًا جزئيًا في العلاقة بين التحول الرقمي والميزة التنافسية. وتشير النتائج بشكل عام إلى أن التحول الرقمي لا

ينبغي النظر إليه كهدف تشغيلي أو استثماري بحت، بل كخيار استراتيجي يُسهم في تحفيز الابتكار، وبناء ميزة تنافسية مستدامة، وتعزيز قدرة الشركات على التكيف مع متطلبات المستقبل..

الكلمات المفتاحية: رقمنة المؤسسات، الميزة التنافسية، الابتكار، الشركات الصغيرة والمتوسطة، التحول الرقمي.