THE EFFECTS OF DIGITAL CAPABILITIES AND INNOVATION ON FIRM PERFORMANCE: THE MODERATING ROLE OF MARKETING STRATEGY

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Abstract: In this study, firm performance is the dependent variable, digital capability and digital innovation are the independent variables, and marketing strategy is the moderating variable. The core conceptual framework is established through demographic variables such as firm size and working hours. This study proposes the following hypotheses: 1. There is a significant difference in digital capabilities among employees with different background variables.2. There is a significant difference in digital innovation among employees with different background variables.3. There is a significant difference in corporate performance among employees with different background variables.4. There is a significant difference in marketing strategy among employees with different background variables.5. There is a positive and significant relationship between digital capabilities and corporate performance.6. There is a positive and significant relationship between digital capabilities and corporate performance. and significant relationship.6. There is a positive and significant relationship between digital innovation and firm performance.7. Marketing strategy moderates the relationship between digital capabilities and digital innovation and firm performance. In this paper, 450 questionnaires were distributed and 433 valid questionnaires were returned to the employees of different industries in S city as a case study.

This study found that:1. the working age variable has a significant effect on marketing strategy.2. the industry variable has a significant effect on marketing strategy.3. there is a positive and significant relationship between digital capabilities and firm performance.4. there is a positive and significant relationship between digital innovation and firm performance.5. marketing strategy does not significantly moderates the relationship between digital capabilities and firm performance.6. marketing strategy significantly moderates the relationship between digital relationship between innovation and firm performance. The purpose of this study is to examine the effects of digital capability and innovation on firm performance, with a particular focus on the moderating role of marketing strategy. By delving into the multifaceted implications of these relationships, it aims to enrich existing knowledge and address the challenges faced by organizations in the digital age.

Keywords: Digital Capabilities, Digital Innovation, Firm Performance, Marketing Strategy

Introduction

The contemporary business environment is undergoing a profound transformation driven by digital technologies. Factors such as the spread of the Internet, the widespread adoption of smartphones and the rise of artificial intelligence are fundamentally reshaping business operations and competitiveness. This digital revolution presents both new opportunities and challenges, forcing organizations to cultivate digital capabilities and foster innovation to sustain their competitive advantage. As firms navigate this intricate landscape, scholarly attention has increasingly focused on understanding the intricate interrelationships between digital capabilities, innovation, marketing strategies, and firm performance. However, the existing literature reveals a glaring gap in that there is still a shortfall in fully exploring the subtle relationships and interactions between these variables. At the heart of this gap is the need for a comprehensive exploration of how digital capabilities and innovation, the two pillars of competitive advantage in the digital age, interact with each other to influence firm performance. While previous research has explored the respective impacts of digital capabilities and innovation, a deeper exploration of the complex interdependencies of how they synergize or counteract each other in organizational settings has yet to be undertaken.

As scholars such as Porter and Heppelmann (2014) have pointed out, digital transformation is not just a shift in technology, but a complete rethinking of business models and processes. Organizations are forced to navigate a complex and ever-changing environment where digital technology is not only an efficiency tool, but also a strategic asset to redefine market positioning and customer engagement.

In academic discussions, digital capabilities is considered a key organizational capability in the digital age. Teece (2018) highlights the need for companies to develop the ability to adapt to and leverage digital technologies. Digital capability covers a range of skills including the ability to analyze data, adopt digital marketing strategies, and foster a culture of continuous learning and innovation. Meanwhile, the concept of digital innovation is gaining traction as a new way for companies to seek to create value in the digital age. Chesbrough (2003) proposed the concept of "open innovation", which advocates that companies should not only rely on internal R&D, but also collaborate with external partners and customers to drive innovation. In the digital environment, this concept has evolved, with companies utilizing open platforms, application programming interfaces, and crowdsourcing to foster innovation.

The intersection of digital capabilities and innovation has become a focus for scholars and practitioners. Firms with higher digital capabilities are better able to capitalize on innovation opportunities, leading to improved performance outcomes (Bharadwaj et al., 2013). However, the relationship between digital capabilities, innovation and firm performance is intricate and depends on a variety of factors.

In dealing with the complexity of the digital environment, the role of marketing strategy becomes crucial. Traditionally, marketing was seen as a function of promoting products, but has evolved into a strategic driver of customer centricity, branding, and market response (Kotler et al., 2017). In the digital space, marketing strategy goes beyond advertising to include full integration of digital channels, data-driven decision making, and customer experience management.

In addition, the moderating role of marketing strategy between digital capabilities, innovation, and firm performance comes to the fore. Verhoef et al. (2017) note that firms that adopt an integrated marketing strategy tend to enhance the positive impact of digital capabilities and innovation on performance. This moderating effect highlights the need for firms to combine marketing efforts with digital capabilities to unlock synergies and drive sustainable competitive advantage.

The dynamic nature of the business environment emphasizes the urgency of exploring these relationships. For example, the emergence of COVID-19 has accelerated the digitization of various industries, prompting the need for firms to not only adopt digital technologies, but also to strategically leverage them to cope with uncertainty and seize emerging opportunities.

In short, the contemporary business environment is characterized by the intricacies of digital capabilities, innovation and marketing strategies. Organizations that successfully navigate this environment are expected to achieve superior performance outcomes. However, the intricate relationships between these variables require comprehensive research. The purpose of this study is to examine the impact of digital capabilities and innovation on firm performance, with a particular focus on the moderating role of marketing strategy. By delving into the multifaceted implications of these relationships, this study aims to enrich existing knowledge and address the challenges faced by organizations in the digital age.

Research Objective (s)

Objective 1: To explore the impact of digital capabilities and innovation on firm performance.

Objective 2: To explore a model of the relationship between digital capabilities, digital innovation and firm performance.

Objective 3: To explore the moderating effect of marketing strategy on the relationship between these variables and firm performance.

Objective 4: To deepen our understanding of how organizations can strategically leverage digital capabilities and innovations to optimize firm performance in the evolving digital landscape.

Literature Review

Digital capabilities refer to an organization's or individual's ability to effectively and strategically utilize digital technologies to achieve desired outcomes (Ghobakhloo, 2018). This includes skills, knowledge, processes, and resources necessary for leveraging digital tools and platforms in a dynamic and adaptive manner (Wessel et al., 2018). Digital capabilities encompass a broad spectrum of competencies, ranging from technical proficiency to digital literacy and strategic acumen (Costa et al., 2020). Several theoretical perspectives have been employed to conceptualize and study digital capabilities. The resource-based view (RBV) emphasizes the role of digital resources and capabilities in achieving sustainable competitive advantage (Bharadwaj et al., 2013). The dynamic capabilities perspective highlights the importance of agility and adaptability in responding to digital disruptions and opportunities (Teece, 2014). Additionally, the socio-technical systems approach emphasizes the interplay between technological infrastructures and social practices in shaping digital capabilities (Orlikowski & Scott, 2015).

Research has underscored the significant implications of digital capabilities for organizational performance and innovation. Organizations with strong digital capabilities are better equipped to navigate digital transformation initiatives and capitalize on emerging technologies (Foss et al., 2019). Digital capabilities enable firms to enhance customer experiences, streamline operations, and foster innovation ecosystems (Zhu et al., 2021). Moreover, they facilitate organizational learning and knowledge creation processes essential for continuous adaptation and renewal (Luftman et al., 2017).

Despite the potential benefits, organizations and individuals encounter various challenges in developing and leveraging digital capabilities. These include resource constraints, legacy systems integration issues, and cultural resistance to change . Skills mismatches and digital divides exacerbate inequalities in access to opportunities and participation in the digital economy (Winkler et al., 2020). Moreover, concerns regarding data privacy, cybersecurity, and ethical implications of digital technologies pose significant barriers to digital capability development (Chen et al., 2021).

Digital innovation refers to the development and implementation of novel digital solutions that create value for individuals, organizations, and society at large. It encompasses a wide range of activities, including the creation of new digital products and services, the adoption of disruptive technologies, and the redesign of business processes to leverage digital capabilities.

Scholars have drawn on various theoretical lenses to understand and analyze digital innovation processes. The disruptive innovation theory, popularized by Christensen (1997), highlights the role of emerging technologies in disrupting existing markets and business models. The diffusion of innovations theory, proposed by Rogers (2003), focuses on the factors influencing the adoption and diffusion of digital innovations within social systems. Additionally, socio-technical systems theory emphasizes the interplay between technological and social factors in shaping digital innovation outcomes (Orlikowski & Iacono, 2015).

Firm performance is a broad concept, and researchers at home and abroad have different opinions on the definition of firm performance. Campbell (1990) believes that firm performance is an action or behavior that can be observed and is related to the organization's objectives. Lebas (1995) believes that "firm performance" is an effective means of measuring the success of a firm in achieving its intended goals. According to Yang (2001), the performance of an enterprise refers to the results of its operations during a certain period of time, specifically including the operation of assets, financial efficiency, capital preservation and appreciation.

Marketing strategy involves the development and implementation of plans and tactics to achieve the organization's goals in the market (Kotler & Keller, 2016). It includes decisions related to product development, pricing, distribution and promotion, tailored to the target customer base and competitive dynamics (Porter, 2008). In addition, marketing strategy integrates insights from market analysis, consumer behavior, and competitive intelligence to create value and maintain long-term relationships with customers .

Recent research has highlighted several emerging trends and perspectives in marketing strategy. Digitalization has profoundly changed marketing practices, leading to the rise of digital marketing strategies such as content marketing, social media marketing, and influencer marketing (Smith & Zook, 2017). In addition, the emergence of big data analytics and artificial intelligence has enabled marketers to leverage data-driven insights for personalized marketing campaigns and real-time decision-making (Gupta et al., 2020). Furthermore, sustainability and corporate social responsibility are increasingly at the center of marketing strategies, reflecting the growing consumer demand for ethical and environmentally friendly products and brands (Reichheld & Sasser, 2017).

In recent years, the impact of digitalization on enterprise performance has been a hot topic in academia. First of all, most scholars' studies concluded that digital transformation is beneficial to the improvement of enterprise performance. Through an empirical study of unbalanced panel data of A-share listed companies from 2007 to 2020, Li (2021) et al. conclude that enterprise digitization significantly promotes enterprise performance, and that this conclusion is more evident in state-owned enterprises and enterprises with higher digitization levels. Wang (2019) & He (2020) concluded that enterprise digital transformation improves the resource integration and value creation ability of each business node in the value chain, helps enterprises predict business development potential and business development direction, and enhances enterprise value. Li (2018) et al. point out that business process digitization will provide a basis for enterprise decision-making and behavior, prompting the excavation of demand outside the traditional market, improve the efficiency of enterprise operations, and thus improve the overall performance of the enterprise. Second, some scholars believe that the use of digital technology can significantly affect the financial performance of enterprises. Through textual analysis of the annual report disclosure data of A-share listed companies in the logistics industry, Wang Wenhua and Zhou Liyao conclude that the digital transformation of logistics enterprises can significantly improve financial performance;

Methodology

Study Population:

The study population in this case is the employees of different industries in the city of S as the focus of the study is on that particular organization. The overall population includes all the employees from various departments, roles and levels within the company.

Sample Size:

Determining the sample size for the study involves a variety of considerations including confidence level, margin of error and overall size to calculate the appropriate sample size.

Since the sample size is unknown and the percentage of the population is unknown.

$$n=\frac{Z^2}{4e^2}$$

$$n=\frac{(1.96)^2}{4\ (0.05)^2}=384.16$$

Therefore, the minimum acceptable sample size is 384.

Snowball sampling technique was used to identify and select the employees of different industries in City S as the participants of this study. Initially, a number of businesses that met the inclusion criteria were identified through industry contacts and publicly available databases. These initial businesses were contacted and invited to participate in this study. Data will be collected through an online survey platform. Participants will receive an invitation via email that includes a link to the survey. The survey will be administered electronically to facilitate access, minimize response time, and ensure efficient data collection. The survey will be accompanied by clear instructions and assurances of data confidentiality and anonymity to promote honest and candid responses.

In order to increase the accuracy of the findings and generalizability of the conclusions, a questionnaire study was conducted on employees of different industries in S. City. A total of 450 questionnaires were distributed and 433 valid questionnaires were returned.

Results

This study analyzed the differences in the mean values of the total scores of the independent and dependent variables among those with different working ages using one-way ANOVA test of variance. The results showed that digital capabilities (P=0.608), digital innovation (P=0.510) and firm performance (P=0.532) were not significantly affected by the working age variable. However, marketing strategy (P=0.027) was significantly influenced by the working age variable.

One-way ANOVA test of variance was used to analyze the differences in the means of the total scores of the independent and dependent variables for those in different positions. The results showed that digital capabilities (P=0.580), digital innovation (P=0.821), firm performance (P=0.492), and marketing strategy (P=0.383) were not significantly affected by the position variable.

This study analyzed the differences in the means of the total scores of the independent and dependent variables among those with different business sizes using one-way ANOVA test of variance. The results showed that digital capabilities (P=0.895), digital innovation (P=0.961), firm performance (P=0.959), and marketing strategy (P=0.810) were not significantly affected by the firm size variable. Differences in the mean values of the total scores of the independent and dependent variables were analyzed across industrialists using one-way ANOVA test of variance. The results showed that digital capabilities (P=0.212), digital innovation (P=0.173), and firm performance (P=0.197) were not significantly affected by the industry variable. However, marketing strategy (P=0.031) was significantly influenced by industry variables. One-way ANOVA test of variance analyzes the difference in the mean of the total scores of the independent and dependent variables for those with different years of company establishment. The results showed that digital capabilities (P=0.836), digital innovation (P=0.648), and corporate performance (P=0.758) were not significantly affected by the year of company establishment variable. While marketing strategy (P=0.388) was not significantly affected by the year of incorporation variable.

After analyzing the coefficient we found that the unstandardized coefficient of digital capabilities is 0.984 and the standardized coefficient is 0.934 with a p-value of 0.000, indicating a positive and significant relationship between digital capabilities and firm performance. After analyzing the coefficient we find that the unstandardized coefficient of digital innovation is 0.740, the standardized coefficient is 0.761, and the p-value is 0.000, indicating that there is a positive and significant relationship between digital innovation and firm performance.

After hierarchical regression analysis of the post-centering data, the significant level of the coefficient of the interaction term between the independent variable (digital capability) and the moderator variable (marketing strategy) after centering. In this case, the significance level of the coefficient of the interaction term between the post-centering independent variable and the moderating variable is 0.120, which is greater than 0.05, indicating that the coefficient is not significant, i.e., the marketing strategy does not significantly modulate the relationship between digital capability and firm performance. The level of significance of the coefficient of the interaction term between the independent variable (digital innovation) and the moderator variable (marketing strategy) after centering. In this case, the significance level of the coefficient of the interaction term between the centered independent variable and the moderator variable is 0.042, which is less than 0.05, indicating that the coefficient is significant, i.e., marketing strategy significantly moderates the relationship between digital innovation and firm performance.

Discussion

Dechant et al. (2020) argued that employees' years of service can have a significant impact on organizational behavior and performance. This factor also plays a vital role in influencing the formulation, implementation and effectiveness of marketing strategies. Makri, Scandura and Glazer (2019) argued that organizational learning theories and workplace socialization processes shed light on the impact of years of service on marketing strategies. As employees gain experience within the organization, the knowledge, skills, and insights they acquire will inform their marketing activities. In addition, longer years of service increase familiarity with organizational culture, norms, and practices, which enhances employees' alignment with marketing objectives. As a result, employees with longer years of service will demonstrate higher levels of organizational commitment, loyalty, and involvement in marketing efforts, reflecting a deeper understanding of and dedication to the organization's marketing efforts.

The industry in which an organization operates has a significant impact on its marketing strategy due to differences in industry characteristics, competitive dynamics and customer preferences. Understanding the nuances of the industry is critical to developing an effective marketing strategy that addresses the different needs and challenges of each industry. An industry-based perspective on strategy emphasizes the role of industry structure, competitive forces, and market conditions in shaping firm behavior and performance. Industries vary in their degree of competition, technological change, regulatory environment, and customer preferences, all of which influence firms' strategic decisions and marketing approaches. Industry-specific factors such as barriers to entry, supplier power, buyer power and threat of substitutes also influence firms' strategic positioning and differentiation strategies. For example, firms in highly competitive industries may pursue cost leadership strategies, while firms in niche markets may prioritize product differentiation and customer segmentation (Kim & Mauborgne, 2015). with degrees that reflect a deeper understanding and dedication to the marketing efforts of their organization.

Digital capabilities, which includes the skills, knowledge, and ability to utilize digital technologies, is key to firm performance in the digital age. Businesses rely on digital tools for innovation, productivity, and customer engagement, so strategic digital resource utilization is critical to business competitiveness and sustainable growth. Empirical evidence demonstrates a positive association between digital capabilities and firm performance across industries and contexts. For example, Mithas et al. (2011) found that firms with strong digital capabilities tend to outperform their peers financially. Investments in digital skills such as online customer analytics and personalized marketing are associated with higher innovation and financial performance, enabling firms to adapt, innovate and create value for customers.

Digital innovation characterized by the adoption of new digital technologies is key to organizational success (Bharadwaj et al., 2013). It promotes first-mover advantage, operational efficiency and differentiated value propositions. Chesbrough and Rosenbloom (2002) highlighted the positive impact of digital innovation on firm performance across industries. Digital innovation disrupts traditional models, facilitates market entry, promotes product, service and process innovation, leverages emerging technologies such as artificial intelligence, blockchain and the Internet of Things to drive revenue growth, enhances the customer experience and ensures competitive advantage.

Marketing strategy has no significant moderating effect on the relationship between digital capabilities and firm performance. While marketing strategy affects how firms demonstrate their digital capabilities, its direct impact on firm performance is influenced by factors outside of marketing, such as organizational culture, leadership, and market dynamics. Conversely, marketing strategy largely moderates the relationship between digital innovation and firm performance. It determines how firms position, promote, and differentiate digital innovations, which in turn affects customer awareness, adoption rates, and revenue generation. An effective marketing strategy increases the visibility, market acceptance and commercialization of digital innovations, driving revenue growth, market share expansion and competitive advantage.

Conclusions

Working age significantly affects marketing strategies. This suggests that the age structure of employees influences the formulation and execution of marketing strategies within an organization. Employees of different ages may have different market insights, skills, and preferences that influence strategic decisions. Organizations may need to consider employee age diversity and adapt marketing strategies to better address different consumer segments and internal stakeholders. Important impact of industry on marketing strategy. Industries vary widely in terms of competitive environments, regulatory requirements, and customer preferences, all of which can profoundly affect marketing strategies. Companies operating in different industries may need to develop unique marketing approaches based on their specific circumstances and challenges. Understanding the nuances of specific industries is critical to developing effective marketing strategies that resonate with target audiences and capitalize on market opportunities.

This study also found a positive relationship between digital capabilities and firm performance. In today's digitally-centric environment, organizations with advanced digital capabilities are better able to respond to digital change, innovate, and drive competitive advantage. Digital capabilities encompass a range of skills, technologies, and organizational competencies that are critical to effectively capitalizing on digital opportunities. Developing digital capabilities within an organization is critical to improving performance outcomes in terms of efficiency, innovation and customer satisfaction. As well as reaffirming the positive relationship between digital innovation and firm performance. Digital innovation has become a key driver of organizational success through the development and adoption of novel digital technologies and solutions. Organizations that embrace digital innovation gain first-mover advantage, improve operational efficiency, and create differentiated value propositions for customers. Digital innovation initiatives help drive revenue growth, market expansion and sustainable competitive advantage.

The findings explore the moderating role of marketing strategy between digital capabilities and firm performance and digital innovation and firm performance, respectively. While marketing strategy has no significant moderating effect on the relationship between digital capabilities and firm performance, it has a significant moderating effect on the relationship between digital innovation and firm performance. This suggests that while marketing strategy may not directly influence the impact of digital capabilities on firm performance, it plays a crucial role in amplifying the performance outcomes of digital innovation initiatives.

In summary, the results of this study highlight the intricate interplay between digital capability, digital innovation, and marketing strategy in shaping organizational performance. Organizations must recognize the importance of digital capabilities and innovation in driving competitive advantage and performance excellence. In addition, they should strategically use marketing strategy to amplify the impact of digital innovation initiatives and effectively engage with different stakeholders and market segments. By adopting an agile, customer-centric approach to marketing through digital transformation, companies can succeed in an increasingly digital and competitive business environment.

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