Digitalization and Financial Performance: Is The relationship Differs for Business Strategies?

الرقمنة والأداء المالي: هل تتأثر العلاقة في وجود استراتيجيات الأعمال؟

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Abstract:

This study aims to investigate the direct effect of digitalization on firms' financial performance proxied using Earnings per Share (EPS), Return on Assets (ROA), and Return on Equity (ROE). In addition, the study investigates how business strategies, cost-leadership and differentiation strategies, could moderate the relationship between digital transformation and financial performance. The study used secondary data obtained from 62 Egyptian firms listed in the Egyptian Stock Exchange during the period between 2018 and 2023. Multivariate regression analysis is used to analyze and test the research models. The results demonstrated that digitalization significantly affects financial performance. However, digitalization has no direct impact on cost leadership or product differentiation strategies. Furthermore, the association between digitalization and financial performance is only moderated by product differentiation strategy.

This research offers useful information for managers and decision makers about how selecting the appropriate business strategy might improve the impact of digitization on the financial performance of Egyptian companies.

Keywords: Digitalization, Business Strategies, Cost- Leadership Strategy, Product Differentiation Strategy, Financial Performance.

JEL Classification: L16, L25, O32

<u>المستخلص:</u>

تهدف هذه الدراسة إلى دراسة التأثير المباشر للرقمنة على الأداء المالي للشركات. تم قياس الأداء المالي باستخدام ثلاث مقاييس: ربحية السهم (EPS)، والعائد على الأصول (ROA)، والعائد على حقوق الملكية (ROE). بالإضافة إلى ذلك، تبحث الدراسة الدور المعدل لاستراتيجية الأعمال المتبعة: استراتيجية خفض التكلفة واستراتيجية تمييز المنتجات، في العلاقة بين التحول الرقمي والأداء المالي.

استخدمت الدراسة بيانات ثانوية تم الحصول عليها من ٦٢ شركة مصرية مدرجة في البورصة المصرية خلال الفترة بين ٢٠١٨ و٢٠٢٣. تم استخدام تحليل الانحدار متعدد المتغيرات لتحليل واختبار نماذج البحث. أظهرت النتائج أن الرقمنة تؤثر تأثيرا مباشرا ذو دلالة احصائية على الأداء المالي. ومع ذلك، فإن الرقمنة ليس لها تأثيرا مباشرا على الاستراتيجية المتبعة سواء استراتيجية قيادة التكلفة أو استراتيجية تمييز المنتجات. علاوة على ذلك، أظهرت نتائج الدراسة أن استراتيجية تمييز المنتجات لها تأثيرا معدلا على العلاقة بين الرقمنة والأداء المالي.

يقدم هذا البحث معلومات مفيدة للمديرين وصناع القرار حول كيفية اختيار استراتيجية الأعمال المناسبة التي يمكن أن تحسن من تأثير الرقمنة على الأداء المالي للشركات المصرية.

الكلمات المفتاحية: الرقمنة، استراتيجيات الأعمال، استراتيجية خفض التكلفة، استراتيجية تمييز المنتجات، الأداء المالي.

1. Introduction:

The process of integrating digital technology to improve corporate practices, operations, and customer experiences across a range of industries is known as "digital transformation" (Warner and Wager, 2019). Digital Transformation is a multidimensional concept that requires a holistic approach, focusing on people, processes, technology, and data to develop new business models and ecosystems landscape (Guarda et al., 2021). The strategic structure of digital transformation encompasses challenges, opportunities, and the need for a global framework to guide organizations in formulating strategies, investing in digital technologies, and adapting to the rapidly evolving digital landscape (Nguyen, 2020). Businesses may achieve long-term benefits, top-line growth, and cost savings through digital transformation by utilizing new, creative digital platforms and agile ideas that strategically match their corporate goals (Nguyen, 2020; and Lang and Lang, 2021).

According to Kuang et al. (2023), several aspects of organization's management and operations have been greatly impacted by digital transformation, which has also changed business models and had a major impact on the environment in which businesses need to survive and grow. Several studies

showed that digital technology has a wide-ranging impact on businesses, highlighting the fact that digital transformation is a must rather than an option. Businesses can more readily and affordably gather large volumes of data with cloud computing, which improves their capacity to respond swiftly to market needs (Ardi et al., 2020; and Kuang et al., 2023). In addition, Goldfarb and Catherine (2019) ascertained that digital technology is a management and administrative tool that can assist companies in improving their coordination and supervision capabilities.

However, while evaluating the pros and cons of digitization, business financial performance may be affected in positive as well as negative ways. (Zeng et al., 2022). Wamba et al. (2017) argued that digitalization is a revolutionary technical advancement that brings new opportunities for improving financial performance by optimizing the production process and enhancing a company's ability to operate in complex situations. Firms that actively engage in digital technology exceed their competitors and enjoy market preferences (Huang et al., 2020; and Yasmin et al., 2020). Despite all its benefits, digital transformation may lead to high management and training costs, leading to a negative effect on a company's financial performance (Zeng et al., 2022). Lack of necessary experience and a company's digital leadership may be the cause of the negative impact of digitalization on a firm's financial performance (Shakina et al., 2021).

Hence, there is ongoing debate in research communities about this contradiction, and there is no agreement on how to address the relationship between digitization and financial performance. Several studies found that digital transformation has significant positive impact on firm's performance and its market value (Huang et al., 2020; and Yasmin et al., 2020). On the other hand, several studies believe that investments in digitalization have negative effects rather than positive ones. Researchers have pointed out that the existing system of digitalization is expensive to install and takes a long time to carry out digital transformation, return on investment, and development of human resource skills and competences needed to manage it. Many firms are still having troubles in implementing the digitization they invested in, at the organizational and strategic levels, which may have an adverse impact on business performance (Ho and Mallick, 2010; Chae et al., 2014; and Maulana et al., 2024). In order to provide a rationale for the "digital transformation paradox," this study attempts to clarify the association between digitalization and company performance. Apart from the direct effect of digitalization on business performance, another question is: What are the other variables that might influence how digital transformation affects financial performance? Alignment with a company's strategy is essential for a successful digital transformation.

Khalili Shavarini et al. (2023) stated that the company's strategy reflects its capability to coordinate its beliefs, environment, and resources to achieve competitive advantage. Studies have documented a significant relationship between business strategy and technology innovation when combined with dynamic capabilities. Businesses must realize that being successful is more about having the appropriate strategy in place than it is about technology (Chesbrough, 2010 and Tahiri, 2022). Two business strategies—cost leadership and product differentiation—that may be used to preserve the company's competitive advantages and accomplish its goals have been presented by Porter (1980). Therefore, an entity may choose to protect its competitive advantage by either lowering the cost of its products (cost leadership) or by offering a product that is distinct in terms of its features, quality, and other associated services (product differentiation). The concept of cost leadership pertains to the premise that a company's products are more appealing to consumers due to their lower cost compared to its competitors. On the other hand, firms that choose product differentiation strategy place a higher value on customers' perceptions of the distinctiveness of their products than they do on cost (Kitsios and Kamariotou, 2021).

Business strategies are greatly influenced by digitalization, particularly when considering the COVID-19 pandemic, global digitalization, and the effects on different markets such as B2B.

Saunila et al. (2023) stated that digital business practices can enhance the firm's performance. Dodie et al. (2023) stated that the benefits of applying digital business strategies are clear, demonstrating the favorable impacts on digitalization success and perceived financial performance. Also, the use of digital tools and technologies allows a company to become more competitive and creates a smoother flow between products, processes, and services. That also includes the alignment of business strategies with the digitalization process. Accordingly, firms need to have the right strategy, digital know how, and skills to survive in this digital age, keep up with evolving consumer wants, and ensure long-term success.

Although digitalization is widespread, the relationship between digitization and performance is still unclear. This is especially important for researchers and practitioners because it might be the foundation for policies that attempt to improve performance through digitization in the current global environment, which suffers from health and economic issues. Most researchers believed that this relationship is complicated, and it could be impacted by a range of variables, including the business's size, industry, and level of digital maturity (Syrine et al., 2024). Unlike previous research, this study integrates business strategy into the research relationships and examines the moderating effect of business strategy in the digitalization impact on corporate performance. Given the potential importance of

business strategy, it is necessary to investigate the role of business strategy in the association between financial performance and digitalization. However, to the best of the researcher's knowledge, no study was conducted to explore this relationship. This is especially true regarding Egyptian companies, as there is no study on this topic.

Determining how business strategy may impact the relationship between digitalization and financial performance in this context is crucial, given the significance of digitalization for financial performance and the unique characteristics of the Egyptian business environment. By emphasizing the role of business strategy in this relationship, the researcher presumes to provide a deeper understanding of the complex relationship between digitalization and financial performance in the Egyptian context, which may be helpful to business leaders seeking to improve their performance and optimize the advantages of new digital transformation. Examining the direct impact of digitalization on business strategy, the direct impact of digitalization on financial performance, and the moderating role of business strategy in the relationship between digitalization and financial performance, is used to address the primary goal of this study, which is to determine whether business strategy influences the relationship between digitalization and financial performance of Egyptian companies.

This study's primary contribution is to clarify a topic that hasn't gotten much attention in the literature: the role that business strategy could play in the relationship between digitalization and performance in the Egyptian environment. Previous studies have mainly concentrated on factors related to technology and operations to identify the factors affecting digital transformation success. Accordingly, this study provides a new explanation for the factors influencing digitalization's success. In addition, it is important to provide empirical evidence that firms should align digital transformation activities with organizational and efficiency measures to increase the likelihood of fulfilling expected performance objectives. Hence, this study is conducted to investigate empirically how corporate ability in managing digital transformation and institutional constraints shape the expected value from digital transformation.

The rest of the paper is structured as follows. The theoretical analysis and hypotheses development are covered in Section 2. The selection of variables measurements and sample selection are explained in Section 3. The empirical findings are discussed in Section 4. The conclusion, recommendations, and directions for future research are presented in Section 5.

2. Theoretical background, Review of Literature and Hypotheses Development:

Today, digital transformation encompasses the integration of various digital technologies like Internet of Things (IoT), Artificial Intelligence (AI), and cloud computing into different sectors such as automotive, healthcare, and education (Lang and Lang, 2021; and Haktanır et al., 2023). It involves reshaping business models, organizational structures, and processes to focus on solving customer problems and enhancing customer experience (Kumar, 2022). The current trends in digital transformation include advancements in IoT, 5G mobile communication, WiFi 6 technologies, and Machine Learning, which are aimed at improving business intelligence and decision-making processes (Guarda et al., 2021). This technological evolution does not bring changes to people's lifestyles only, but also challenges organizations to adapt to these advancements to remain competitive and innovative in today's dynamic digital landscape (Guarda et al., 2021). As digitalization continues to revolutionize industries and societies, companies must undergo significant organizational changes to leverage digital technologies and stay relevant in the ever-evolving market (Lang and Lang, 2021).

Digital transformation in Egypt is a multifaceted process encompassing various sectors like the public sector, private organizations, and even city planning. In the public sector, factors such as financial capabilities, infrastructure, organizational culture, and employee skillsets play crucial roles

in successful implementation (Elsafty and Yehia, 2023). Private sector organizations in Egypt prioritize digital transformation to enhance organizational agility and strategic risk management, with agility mediating the relationship between digital transformation and risk management (Saleh and Saad, 2023). Moreover, the drive towards smart, sustainable cities in Egypt, particularly in regions like Upper Egypt, emphasizes the importance of innovative technologies in achieving digital transformation for urban development (Omayer et al., 2022). In the private electricity sector, digital transformation influences project management efficiency, highlighting the significance of employee digital skills, transformation strategy, and technology in driving these changes (Elabshihy and Saad, 2023).

2.1. Digital Transformation and Financial Performance

The use of digital technology in businesses helps to address the uncertainty of complex systems by enabling the automatic transfer of data, giving corporate management more power, and improving the efficiency of resource allocation (Wang et al., 2024). Dynamic capability theory assumes that any firm needs specific abilities to effectively adapt to and thrive in their constantly changing environment through developing, combining, and adjusting their resources (Teece, 2017). Papadopoulos et al. (2022) and Wang et al. (2024) argued that the dynamic capability theory provides an important lens for examining the economic impacts of digital transformation. According to Wang et al.

(2024), companies might be proactive or reactive in adopting new digital technologies depending on their strategies and in turn, increase their digital and dynamic capabilities. This can significantly improve their innovation, supply chains, and value chains, as well as overall management skills.

From an accounting perspective, digital transformation has significant positive impact on the firms' financial performance (Chen and Zhang, 2024; and Shah et al., 2024). According to Liang et al. (2010) and Abbasi and Weigand (2017), digital transformation could lead to improved financial performance as IT capabilities could improve efficiency and organizational abilities if merged with enhanced capabilities, thus improving overall performance and gaining competitive advantage in the marketplace. Jardak and Ben Hamad (2022) examined the impact of digital maturity on a firm's performance using 3 proxies for financial performance: ROA, ROE, and Tobin's Q. The results indicated that while digital maturity has a positive impact on Tobin's Q, it has a negative impact on ROA and ROE. According to Jardak and Ben Hamad (2022), companies pursuing digital transformation may have short-term financial difficulties, which could result in decreasing ROA and ROE. However, they can improve their market value and performance over time, as indicated by Tobin's Q.

In addition, Zhou et al. (2018) claimed that implementing digital technologies like cloud computing and the IoT could link physical equipment between companies, creating a cooperative network to enhance operational efficiency and adaptable production. These accomplishments are considered important resources that can enhance financial results. However, Xu et al. (2020) contended that there is a potential for operational risk brought on by digital transformation because of the lack of compatibility between digital devices and manufacturing equipment. Nevertheless, conducting pilot tests could help in solving this issue. Through applying digital technology, firms could enhance organizational innovation and digital marketing (Tsou and Chen, 2023), improve production efficiency and inventory management (Zhang et al., 2022), and modify business models (Li, 2020) to efficiently adjust to the changing competitive environment. Therefore, despite the high costs associated with digital transformation (Hanelt et al., 2021), it has the potential to enhance the efficiency of resource allocation in companies, leading to notable economic benefits for companies.

On the other hand, digital transformation might potentially result in significant management and training expenses as well as a long "difficult phase," which can have a negative effect on a company's financial performance (Zeng et al., 2022). This could occur due to lack of relevant experience and digital leadership of firms (Shakina et al., 2021). Consequently, there is considerable

ambiguity regarding the advantages—or even disadvantages—of digitization due to the conflicting results of previous studies regarding the effect of digitalization on a company's financial performance.

Even though several studies have already been conducted, no agreement has been reached regarding the association between firms' performance and digitization. This study carried out theoretical analysis and empirical testing on the influence of digitalization on firms' performance to investigate the crucial elements that motivate the improvement of business performance and offer some insights into the expansion of business digitalization. In line with the above discussion, the first hypothesis is formulated as follows:

H₁: There is a positive significant relationship between digital transformation and financial performance.

2.2. Digital Transformation and Business Strategy

A company's strategy refers to the direction or vision established by its management for the coming years (Proksch et al., 2024). Therefore, management decisions about resource allocation determine how successful a corporate enterprise will be. To support businesses in pursuing organizational goals and deciding how to allocate resources and practices that maintain their competitive advantages, business strategy can reflect how and when daily operations are carried out while achieving

organizational goals (Yang and Yee, 2022). In addition, business strategies help companies developing systematic problem-solving and reflection review skills through offering reliable, routinized operational blocks and assessing operational adaptability and efficiency (Veld et al., 2010). Two broad approaches are described in the literature on business strategies: product differentiation and cost leadership. The cost leadership strategy helps companies create a cost-based manufacturing plan by developing the production and resource allocation techniques needed to adopt a low-cost attitude to gain competitive advantage (Ward and Duray, 2000). Product differentiation strategy establishes organizational procedures that support providing distinctive services or products to satisfy specific customers' needs; as a result, it enables companies to develop manufacturing strategies that focus on quality, flexible, and innovative (Ward and Duray, 2000). Therefore, product differentiation is a manufacturing approach that aims to provide goods and services that are superior to those in the same industry in terms of quality, value, uniqueness, and distinction. Maulana et al. (2024) argued that product differentiation strategy is a result of the industry's desire to satisfy customers' expectations for distinctive and unconventional products, leading to gaining a competitive advantage. Moreover, Maulana et al. (2024)' findings indicated that to implement a product differentiation strategy, companies

should prioritize investing in new technologies like big data and artificial intelligence.

According to the literature, cost reduction is the cost-leadership strategy's primary focus, resulting in well-organized, strictly managed, and unflexible procedures (Devaraj et al., 2004; Felin et al., 2012; and Yang and Yee, 2022). On the other hand, product differentiation strategy entails adaptable procedures that enable businesses to put forth innovative concepts and motivate managers to carry out creative tasks. These procedures are more pertinent to the operational goals linked to radical innovation and continuous improvements (Devaraj et al., 2004; Felin et al., 2012; and Yang and Yee, 2022). According to Hoopes and Madsen (2008), digitalization conveys the necessity for firms to explore and integrate digital technology through learning and problem-solving approaches. It also encourages them to engage in exploitative and exploratory activities to gather information that would help them develop innovative processes.

Hence, product differentiation strategy might be vital prerequisite for establishing dynamic operational skills in digital manufacturing, whereas cost leadership strategy tends to play a smaller role in the development of operational capabilities for digitalization. Based on the above discussion, the second and the third hypotheses are formulated:

H_2: There is a significant direct relationship between digital transformation and the implementation of cost- leadership business strategy.

H_3: There is a significant direct relationship between digital transformation and the implementation of product differentiation business strategy.

2.3. The Moderating Effect of Business Strategy on the Relationship Between Digital Transformation and Financial Performance

It has been proved from reviewing business strategies literature that the fundamental idea behind a cost leadership strategy is that companies should use a range of efficient tactics to gradually reduce their production and operating costs below the industry average to gain a competitive advantage in pricing. Banker et al. (2014) argued that companies employing cost leadership strategy could reduce their costs while increasing operational efficiency through economies of scale, process optimization, and more rapid capital turn over. In the context of digital transformation, traditional cost leadership approach is faced with an adaptation challenge. "Cost reduction" is the starting point for decision-making according to the cost leadership strategy. Costs include transaction, organizational, general costs, and so on. However, in the digital era, companies

could reduce transaction and organizational costs simultaneously (Ren and Lin, 2024). According to Zhai et al. (2022), digital transformation significantly improves businesses' economic growth and productivity. It also offers opportunities to reduce general administrative and sales expenses, promote cross-regional manufacturing company investment, and shift the investment structure to one that is more servitized. In addition, firms could utilize information technology to enhance their performance and operational efficiency through digital transformation, which enhances business procedures and creates value (Mahmood et al., 2019).

Compared with cost leadership strategy, companies that employ a product differentiation approach are frequently able to customize their products, however, this process requires strong connections with suppliers and customers (Graham and Bansal, 2007). Banker et al. (2014) found that these connections could improve information among suppliers, companies, and customers. In addition, product differentiation strategy allows customers to participate in product development as it concentrates on developing creative products based on customers demand. Therefore, firms adopting product differentiation strategy are more likely to achieve sustainable competitive advantage (Yang and Yee, 2022). Consequently, digitalization can penetrate the current manufacturing processes and systems more readily and quickly under the product differentiation

strategy. Moreover, according to Banker et al. (2014), companies that follow product differentiation strategies must also build strong relationships across the various supply chain players. This guarantees that truthful and reliable data from suppliers and customers are used more efficiently in digital manufacturing, which would lead to increasing business profitability.

Based on the above analysis of literature, the fourth and fifth hypotheses are formulated as follows:

H₄: Cost leadership strategy enhances the relationship between digital transformation and financial performance.

H₅: Product differentiation strategy enhances the relationship between digital transformation and financial performance.

3. <u>Research Methodology:</u>

3.1. Data Collection and Sample Size

The Egyptian stock market listed manufacturing companies in EGX 100 for 2023 made up the study initial sample. The data was collected during the period 2018 to 2023. This period was selected because, before to 2018, digital technologies were hardly used by Egyptian firms. The deep and direct integration of the digital and traditional economies began to occur around 2018, when the Ministry of Communications and Information Technology (MCIT) developed the nation's 2030 ICT strategy, "Digital Egypt," in 2017 (Kamel, 2021). In

addition, the Mubasher information website's data availability was a factor in the selection of this period. The following companies were excluded from the study's sample: (1) information technology and communication companies; (2) software development companies; (3) financial sector companies; and (4) companies having missed data. Finally, 413 sample observations and 62 sample firms were gathered. The published annual financial reports obtained from The Egyptian Company for Information Dissemination (EGID), Mubasher, and the listed companies' websites are the main sources of data related to digitalization, business strategies, and financial performance.

3.2. Model Formulation

The first hypothesis is concerned with testing how a company's financial performance is affected by digital transformation. Therefore, the following model is developed:

$$FP_{it} = \alpha + \beta_1 \, DT_{it} + \beta_2 \, SIZE_{it} + \beta_3 \, Lev_{it} + \varepsilon_{it}$$
………………….….Model (1)

The second and third hypotheses are formulated to test the effect of digitalization on the two business strategies, cost-leadership and product differentiation strategies. Therefore, the following two models are developed:

$$LEAD_{it} = \alpha + \beta_1 \, DT_{it} + \beta_2 \, SIZE_{it} + \beta_3 \, Lev_{it} + \varepsilon_{it}$$
…….…………...Model (2)

$$DIFF_{it} = \alpha + \beta_1\ DT_{it} + \beta_2\ SIZE_{it} + \beta_3\ Lev_{it} + \varepsilon_{it}$$

………………*Model (3)*

The fourth and fifth hypotheses are formulated to test the moderating effect of effect the two business strategies, cost-leadership and product differentiation strategies on the relationship between digitalization and financial performance. Therefore, the following two models are developed:

$$FP_{it} = \alpha + \beta_1\ DT_{it} + \beta_2\ LEAD_{it} + \beta_3\ DT_{it} * LEAD_{it} + \beta_4\ SIZE_{it} + \beta_5\ Lev_{it} + \varepsilon_{it}$$ ………………
………………………………......…*Model (4)*

$$FP_{it} = \alpha + \beta_1\ DT_{it} + \beta_2\ LEAD_{it} + \beta_3\ DT_{it} * DIFF_{it} + \beta_4\ SIZE_{it} + \beta_5\ Lev_{it} + \varepsilon_{it}$$
………………………………………………………
…*Model (5)*

3.3. Variables Measurements

The independent variable, digitalization, is proxied as a dummy variable of value "0" if no digitalization keyword was found in the annual reports of sample companies, and of value "1" if the annual reports of a given company contain any digitalization keyword. The digitalization keywords, extracted from Chen and Xu (2023) and Rahman and Ziru (2023), consist of "Artificial Intelligence (AI) Technology", "Big Data Technology", "Blockchain", and "Cloud Computing".

The moderating variable, business strategy, is classified into cost-leadership strategy and product differentiation strategy. Both types of business strategies are measured using proxy measures adopted from Valipour et al. (2012). The ratio of total sales to total assets is used for measuring the cost leadership strategy. However, the ratio of research and development (R&D) expenses to total sales is used to measure the product differentiation strategy.

The dependent variable, financial performance, is measured using three proxy measures adopted from Chen and Zhang (2024). These proxies include Return on Equity (ROE), Return on Assets (ROA), and Earnings Per Share (EPS). Specifically, EPS is computed by deducting preferred dividends from net income and dividing the result by the total number of outstanding common shares. ROE is calculated by dividing net income by shareholders' equity. ROA is calculated by dividing net income by the average total assets.

Furthermore, a range of control variables are used to mitigate any possible bias. To reduce the impact of a firm's characteristics, firm size (SIZE) is chosen as one of the control variables. Financial leverage (LEV) is utilized as a control variable to account for potential effects of firm-level economic determinants on businesses' financial performance (Chen and Xu, 2023). Table (1) summarizes the measurements for the research variables.

Table (1): Variables Measurements and Proxies

Variables	Proxies	Measures	Data Source

Digitalization	Digitalization practices (DIGI)	Dummy Variable (0= No keyword of digitalization is found, while 1= digitalization keyword is found in the annual reports)	Annual Reports
Business Strategies	Cost Leadership (LEAD)	Total Sales / Total Assets	Financial Statements
	Product Differentiation (DIFF)	R&D Expenses / Total Sales	
Financial Performance (FP)	Earnings Per Share (EPS)	(Net Income – Preferred Dividends) / No. of Common Shares Outstanding	Financial Statements
	Return on Equity (ROE)	Net Income / Shareholders' Equity	Financial Statements
	Return on Assets (ROA)	Net Income / Total Assets	Financial Statements
Control Variables	Firm Size (SIZE)	The log of the year-end total assets	Financial Statements
	Leverage (LEV)	Total debts / total assets	Financial Statements

4. <u>Statistical Analysis and Hypotheses Testing:</u>

The following techniques were used to evaluate the data collected for this study using the statistical software SPSS 24. The mean, median, range, standard deviation, lowest, and maximum values are determined using descriptive analysis. Second, the direction and strength of the linear relationships between the research variables are examined using Pearson's correlation. Third, regression modeling was used to test the study hypotheses.

4.1. Descriptive Statistics

Table 2 presents the findings of the descriptive statistics for all the study's variables, except digitalization, which is a dummy variable. According to table 2, cost-leadership strategy varies between (0) and (11.2673), with mean value of (0.7940), which shows that the adoption rate of cost-leadership strategy is relatively high. Product differentiation strategy varies between (0) and (0.0875) with mean value of (0.0015), meaning that the

adoption rate of product differentiation strategy is relatively low. EPS, the first proxy measure of financial ranges between (-10.92) and (24.9600), with mean value of (0.9055). This indicates a moderate level of profitability among the sample companies. ROE, the second proxy measure of financial performance, varies between (-13.7869) and (1.9149), with a mean value of (0.0466), indicating a relatively low ROE among the Egyptian companies. ROA, the third proxy measure of financial performance, varies between (0.5246) and (1.3161), with a mean value of (0.0734). This suggests that the companies included in the study are generally profitable although they may not be very efficient in utilizing their assets.

Table (2): Descriptive Statistics

	Minimum	Maximum	Mean	Standard Deviation
Cost-Leadership Strategy	0	11.2673	0.7940	0.9792
Product Differentiation Strategy	0	0.0875	0.0015	0.0062
Financial Performance (EPS)	-10.92	24.9600	0.9055	2.4999
Financial Performance (ROE)	-13.7869	1.9149	0.0466	0.9431
Financial Performance (ROA)	0.5246	1.3161	0.0734	0.1405
Firm Size	4.3629	7.9406	6.3901	0.6340
Financial Leverage	0.0089	5.3984	0.5369	0.4268

Moreover, the mean value of firm size is (6.3901). The sample firms represent all Egyptian businesses that are active in the market since their sizes range from (4.3629) to (7.9406). Additionally, approximately 46% of Egyptian companies use debt to fund their operations, as indicated by the mean value of the financial leverage ratio in Table 2.

4.2. Pearson Correlation Test

To determine the direction and degree of the correlation between the study's variables, a Pearson correlation matrix is built. Table (3) presents the findings of a one-tailed significance test utilizing Pearson Correlation. According to Table (3)'s findings, financial performance as measured by EPS has the highest correlation with digitalization—a correlation that is significant at the 0.01 level. The Pearson coefficients show that there is a positive correlation between EPS and digitalization. Furthermore, financial performance as measured by ROA is the variable most strongly connected (significant at the 0.01 level) with the cost-leadership strategy, according to Pearson correlation results.

Table (3): Pearson's Correlation Matrix

		DT	LEAD	DIFF	EPS	ROE	ROA	SIZE	LEV
DT	Pearson Correlation	1							
	Sig. (2-tailed)	-							
LEAD	Pearson Correlation	0.002	1						
	Sig. (2-tailed)	0.481	-						
DIFF	Pearson Correlation	0.069	-0.094	1					
	Sig. (2-tailed)	0.081	0.028	-					
EPS	Pearson Correlation	0.084*	0.033	-0.030	1				
	Sig. (2-tailed)	0.045	0.250	0.272	-				
ROE	Pearson Correlation	-0.048	0.034	0.012	0.018	1			
	Sig. (2-tailed)	0.164	0.243	0.403	0.359	-			
ROA	Pearson Correlation	0.044	0.152**	0.015	0.461**	0.065	1		
	Sig. (2-tailed)	0.185	0.001	0.384	0.000	0.093	-		
SIZE	Pearson Correlation	0.077	-0.027	0.019	0.153**	-0.055	0.146**	1	
	Sig. (2-tailed)	0.060	0.295	0.351	0.001	0.131	0.001	-	
LEV	Pearson Correlation	0.048	-0.034	-0.012	-0.018	-1.000**	-0.065	0.055	1
	Sig. (2-tailed)	0.164	0.243	0.403	0.359	0.000	0.093	0.131	-
** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).									

4.3. Regression Analysis and Discussion of Results

The five research models are evaluated using multivariate analysis. The direct relationship between digitalization and financial performance is examined in the first model. The second and third models examine how digitalization could affect business strategy, cost-leadership and product differentiation strategies. The fourth and fifth models examine how business strategies could moderate the relationship between digitalization and a company's financial performance.

Results of the Relation between Digitalization and financial performance

The influence of digitalization on financial performance—as determined by EPS, ROA, and ROE—is examined in the first regression model. Using the three proxy measures, this regression model (Models 2A, 2B, and 2C) is run three times to assess the firm's financial performance. Table 4 provides a summary of the regression analysis's findings. Models 1A and 1C have moderate R-square values of 0.290 and 0.280 respectively, indicating that they are relatively significant. However, because model 1B's R-square value is 1.000, it is highly significant. In addition, it is clear from Panel B of model 1A that financial performance measured using EPS is positively influenced by the adoption of digitalization. This result is in line with studies by Liang et al. (2010), Abbasi and Weigand (2017), Chen and Zhang (2024) that demonstrated that digital transformation could

have a positive impact on financial performance. This could be justified because digitalization helps in improving operational efficiencies, generating higher revenues, and lowering costs, which in turn supports a firm's net income, leading to higher EPS. As a result, the first hypothesis, stating that "There is a positive significant relationship between digital transformation and financial performance" is accepted.

Table 4: Multiple regression model of the relationship between digitalization and financial performance

Panel A: Model (1A) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
1A	0.539	0.290	0.220	2.472	

Panel B: Coefficients [a]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	3.021	1.236		2.445	0.050
Digitalization	0.368	0.144	0.174	2.507	**0.033**
Firm Size	0.586	0.193	0.149	3.036	0.003
Financial Leverage	-0.0002	0.000	0.030	0.607	0.544

[a] Dependent Variable: Financial performance (EPS)

Panel A: Model (1B) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
1B	1.000	1.000	1.000	0.896	

Panel B: Coefficients [b]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	0.664	0.448		1.181	0.139
Digitalization	-0.038	0.089	0.000	-0.431	0.667
Firm Size	0.164	0.070	0.000	2.352	0.019
Financial Leverage	-0.113	0.000	-1.000	4.918	0.000

[b] Dependent Variable: Financial performance (ROE)

Panel A: Model (1C) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
1C	0.529	0.280	0.210	1.390	

Panel B: Coefficients [c]					

Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	-0.140	0.069		-2.018	0.044
Digitalization	0.010	0.014	0.037	0.747	0.455
Firm Size	0.033	0.011	0.148	3.013	**0.003**
Financial Leverage	-0.004	0.000	0.075	1.540	0.124

^c Dependent Variable: Financial performance (ROA)

Results of the Relation between Digitalization and Business Strategies

The influence of digitalization on business strategies, cost-leadership and product differentiation strategies, is examined in the second and third regression models. Table 5 presents a summary of the regression analysis's findings of the second and third models. The second and third models fail to show statistical significance based on the data shown in Table 5, as their respective R-square values are 0.02 and 0.05. Furthermore, it is evident that digitization and business strategies—cost leadership and differentiation strategies, in particular—are not significantly correlated. Although digitalization provides opportunities for enhancing operational efficiency, it is not always associated directly with cost leadership strategy due to several reasons. First, the costs of digital transformation are considerable both initial and ongoing costs. Second, digital transformation prioritizes innovation and efficiency rather than immediately cutting costs. Third, connecting digital activities with primary cost drivers is a major difficulty for Egyptian companies. Fourth, the relationship between digitization and

cost-leadership strategy may be influenced by several industry-specific characteristics, which may or may not result in notable cost savings.

In addition, failure to find a significant direct effect of digitalization on differentiation strategy could be justified for several reasons. First, digitalization frequently concentrates on efficiency and process enhancements rather than producing distinctive, customer-focused products. Secondly, competitors have embraced digital technologies, and they are easily accessible, making it challenging to obtain a competitive edge through digitalization only. Finally, internal operational changes that might not be immediately apparent to or beneficial to customers are frequently the focus of digitalization programs.

Therefore, the second and the third hypotheses which state that "There is a significant direct relationship between digital transformation and the implementation of cost- leadership business strategy" and "There is a significant direct relationship between digital transformation and the implementation of product differentiation business strategy" respectively, are rejected.

Table 5: Multiple regression model of the relationship between digitalization and business strategy

Panel A: Model (2) Summary				
Model	R	R^2	Adjusted R^2	Std. Error
2	0.141	0.020	0.050	1.982
Panel B: Coefficients [a]				
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	1.038	0.491		2.115	0.035

Digitalization	0.011	0.097	0.006	0.118	0.906
Firm Size	-0.039	0.077	-0.025	-0.507	0.613
Financial Leverage	-0.001	0.000	-0.033	-0.673	0.502

[a] Dependent Variable: Cost-Leadership Strategy

Panel A: Model (3) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
3	0.224	0.05	0.02	0.062	

Panel B: Coefficients [b]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	0.000	0.003		0.061	0.951
Digitalization	0.001	0.001	0.069	1.384	0.167
Firm Size	0.000	0.000	0.015	0.295	0.768
Financial Leverage	-0.032	0.000	-0.016	-0.329	0.742

[b] Dependent Variable: Product Differentiation Strategy

Results of the Relation between Digitalization, Business Strategies and Financial Performance

To examine the moderating effect of business strategy on the relationship between digitalization and financial performance, the fourth and the fifth models are tested. The results of the fourth model are presented in Table 6, and the results of the fifth model are shown in Table 7. Each model is run three times to examine the moderating effect of business strategies on the relationship between digitalization and financial performance proxied using the three measures, EPS, ROE, and ROA.

Table 6 presents the regression results of the moderating effect of cost leadership strategy on the relationship between digitalization and financial performance. According to the fourth

multiple regression model, models 4A, 4B, and 4C are significant with R-Square value of 31.5%, 100%, and 31.5%, respectively. The results shown in Table 6 provide evidence that cost leadership strategy does not moderate the relationship between digitalization and financial performance. Although a cost-leadership strategy might lead to some advantages, it is also likely to suffer from restrictions that limit its ability to act as moderator in the relationship between digitalization and financial performance due to its emphasis on cost reduction, enhancing efficiencies meanwhile ignoring customer involvement. Firms wanting to win in the digital economy may have to balance two seemingly opposing approaches after all, cost efficiency and innovation. Therefore, the fourth hypothesis that states that "Cost leadership strategy enhances the relationship between digital transformation and financial performance" is rejected.

Table 6: Multiple regression model of the relationship between digitalization, cost-leadership strategy and financial performance

Panel A: Model (4A) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
4A	0.561	0.315	0.257	2.476	
Panel B: Coefficients [a]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	3.016	1.237		2.437	0.015
Digitalization	0.360	0.252	0.072	1.425	0.155
Cost-Leadership Strategy	-27.227	38.395	-0.068	-0.709	0.497
Digi*Cost Leadership	16.072	44.624	0.035	0.360	0.719
Firm Size	0.590	0.193	0.150	3.050	0.002
Financial Leverage	-0.002	0.000	-0.030	-0.616	0.538
[a] Dependent Variable: Financial performance (EPS)					
Panel A: Model (4B) Summary					
Model	R	R^2	Adjusted R^2	Std. Error	
4B	1.000	1.000	1.000	0.892	
Panel B: Coefficients [b]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	-0.663	0.449		-1.476	0.141
Digitalization	-0.048	0.092	0.000	-0.529	0.597

Cost-Leadership Strategy	-4.412	13.927	0.000	-0.317	0.751
Digi*Cost Leadership	7.119	16.187	0.000	0.440	0.660
Firm Size	0.165	0.070	0.000	2.355	0.019
Financial Leverage	-0.113	0.000	-1.000	7.899	0.000

[b] Dependent Variable: Financial performance (ROE)

Panel A: Model (4C) Summary

Model	R	R^2	Adjusted R^2	Std. Error	
4C	0.562	0.315	0.257	0.139	

Panel B: Coefficients [c]

Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	-0.140	0.070		-2.011	0.045
Digitalization	0.007	0.014	0.024	0.466	0.642
Cost-Leadership Strategy	-1.745	2.158	-0.078	-0.808	0.419
Digi*Cost Leadership	2.612	2.508	0.101	1.041	0.298
Firm Size	0.0330	0.011	0.149	3.032	0.003
Financial Leverage	-0.003	0.000	-0.075	-1.527	0.128

[c] Dependent Variable: Financial performance (ROA)

Table 7 shows the regression results of the moderating effect of product differentiation strategy on the relationship between digitalization and financial performance. According to the fifth multiple regression model, models 5A and 4B are significant with R-Square value of 31.5% and 100%, respectively. The results shown in Table 7 provide evidence that product differentiation strategy moderates the relationship between digitalization and financial performance. Companies may be able to improve their product differentiation strategy because of digitalization. Utilizing digital technology, such as artificial intelligence, data analytics, and online platforms, helps companies better understand their customers' preferences and customize their goods and services to fit their demands. When integrated with digitalization, a strong product differentiation strategy could improve financial performance, enable companies to gain competitive advantage, and increase customer loyalty. Therefore, the fifth hypothesis that states that "Product

differentiation strategy enhances the relationship between digital transformation and financial performance." is accepted.

Table 7: Multiple regression model of the relationship between digitalization, cost-leadership strategy and financial performance

Panel A: Model (5A) Summary				
Model	R	R^2	Adjusted R^2	Std. Error
5A	0.561	0.315	0.257	2.476

Panel B: Coefficients [a]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	3.133	1.262		-2.483	0.013
Digitalization	0.383	0.323	0.077	1.187	0.236
Differentiation Strategy	0.106	0.219	0.042	0.484	0.629
Digi*Differentiation	0.021	0.267	0.007	0.077	0.939
Firm Size	0.590	0.194	0.150	3.048	0.002
Financial Leverage	-0.002	0.000	-0.029	-0.583	0.560

[a] Dependent Variable: Financial performance (EPS)

Panel A: Model (5B) Summary				
Model	R	R^2	Adjusted R^2	Std. Error
5B	1.000	1.000	1.000	0.892

Panel B: Coefficients [b]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	0.877	0.454		1.930	0.054
Digitalization	0.110	0.116	0.218	0.942	0.347
Differentiation Strategy	0.192	0.079	0.174	2.426	0.016
Digi*Differentiation	0.188	0.096	0.258	1.955	0.049
Firm Size	0.174	0.070	0.394	2.498	0.013
Financial Leverage	-0.113	0.000	-1.000	-1.183	0.000

[b] Dependent Variable: Financial performance (ROE)

Panel A: Model (5C) Summary				
Model	R	R^2	Adjusted R^2	Std. Error
5C	0.245	0.060	0.048	0.137

Panel B: Coefficients [c]					
Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Standard Error	Beta		
Constant	-0.184	0.070		-2.640	0.009
Digitalization	0.032	0.018	0.113	1.774	0.077
Differentiation Strategy	0.041	0.012	0.283	3.340	0.001
Digi*Differentiation	0.027	0.015	0.176	1.860	0.046

| Firm Size | 0.035 | 0.011 | 0.156 | 3.228 | 0.001 |
| Financial Leverage | -0.003 | 0.000 | -0.073 | -1.504 | 0.133 |

c Dependent Variable: Financial performance (ROA)

5. <u>Conclusion, Recommendations, and Future Research:</u>

This paper's primary goal is to investigate how business strategies, cost-leadership and product differentiation, could mitigate the association between financial performance and digitalization. Given the growing trend of corporate digital technology adoption, it is critical to comprehend these technologies and understand how they could be aligned with strategic approaches to enhance financial performance. This goal is met by examining, first, the direct relationship between digitalization and financial performance, second, the direct relationship between digitalization and the two business strategies, and third, the two business strategies as moderators for the relationship between digitalization and financial performance.

This paper explores how different firm strategies may act as moderators in the relationship between digitalization and financial performance. As firms incorporate more digital technologies, the interaction between those technologies and strategic methods become more integral in promoting better financial performance.

This research highlights the fact that different business strategies (such as differentiation and cost leadership) could have a significant impact on how digitalization affects financial

performance. For instant, a product differentiation strategy could make digital initiatives more valuable in the areas of customer engagement and loyalty and therefore better financial performance. However, cost leadership strategy could inhibit the full benefits that could be achieved from digitalization when it focuses on operational efficiency and ignores innovation and customer experience.

According to the study's findings, one of the keyways in which digitalization can improve a company's financial performance is through enabling operational efficiencies, increasing revenues generation, and lowering operational costs, which in turn increase company's net income. Digitalization lowers operational costs through process automation, supply chain efficiency, and reduced labor costs, which has a direct impact on its financial performance. In addition, digital advances enable new streams of revenues, deeper customer engagement and broader geographical reach leading to an increase in the overall profitability of Egyptian companies.

However, the effectiveness of digitalization in improving financial performance is not consistent; it depends on the business strategy followed by the firm. In many cases, digitalization is better aligned with differentiation and innovation strategies rather than cost leadership. For digitalization to impact cost leadership in a meaningful way, it would have to be focused expressly on the drivers of cost reduction, such as supply chain

optimization, automation, and lean production. On the other hand, for digitalization to contribute to differentiation, companies must use digital tools in a way that creates unique customer-perceived value, be it through personalization, innovation, or exceptional customer experiences. Just adopting digital technologies without a clear strategy on how they enhance differentiation may not lead to a direct correlation between digitalization and differentiation.

Based on the findings of this paper, several recommendations are proposed. First, Egyptian companies should align digital initiatives with their business strategies. Firms must ensure that its digital efforts are integrated with their business strategies. Second, for firms implementing cost-leadership strategy, it is vital for digital technologies to focus on enhancing operational efficiencies and reducing costs. This could be achieved by using techniques that increase profitability and maintain competitive prices such as supply chain optimization and data driven decision making. Third, Egyptian companies should invest in upgrading their workforce skills to ensure the success of their digital transformation process.

This paper suggests several directions for future research regarding the relationship between digitalization, business strategies, and financial performance. Further research may explore the moderating effect of digital strategy between

digitalization and financial performance. In addition, future research may include specific industry analysis to investigate how the relationship between digitalization, business strategies, and financial performance could differ across industries. Moreover, future studies could conduct longitudinal studies to examine the long-term effects of digital transformation on financial performance. This could help in determining success and failure factors of digitalization.

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