SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 11, No. 3.1, (2025), pp. 1214-1231
Open Access. Online & Print

DOI: 10.5281/zenodo.11325113

THE IMPACT OF DIGITAL TRANSFORMATION ON COST REDUCTION IN PUBLIC SECTOR JORDANIAN INDUSTRIAL COMPANIES

Yousef Khaled Abuorabi[1], Faris Irshed Oudah Alkarabshah[2], Omar M. Alhawtmeh[3*], Laith Ahmad Mohammad Alkasasbeh[4]

[1]Department of Accounting, School of Business, The University Of Jordan\ Aqaba Branch, Jordan, y.abuorabi@ju.edu.jo, https://orcid.org/0000-0003-4872-5951.
[2]Accounting Department – Al-Balqa Applied University – Al-Salt– Jordan. Dr-fariskhkh@bau.edu.jo, https://orcid.org/0000-0003-3029-8891
[3]Associate Professor, Department of Accounting, School of Business, The University Of Jordan\ Aqaba Branch, Jordan. a.alhawtmeh@ju.edu.jo, https://orcid.org/0000-0002-4396-0584
[4]Department of Financial & Administrative Science- Aqaba University College – Al-Balqa Applied University Aqaba – Jordan. laith.alkasasbeh@bau.edu.jo, https://orcid.org/0000-0001-6450-6877

Received: 08/09/2025
Accepted: 14/09/2025

Corresponding Author: Omar M. Alhawtmeh (a.alhawtmeh@ju.edu.jo)

ABSTRACT

This study aimed to assess the impact of digital transformation—encompassing its dimensions of digital processes, digital business models, individual impacts, and digital customer activities—on cost reduction in Jordanian public joint stock industrial companies. Employing a descriptive and analytical approach, the research focused on the 46 industrial companies listed on the Amman Stock Exchange. Data were collected through an electronic questionnaire distributed to senior management personnel, including General Managers, Deputy General Managers, department Manager, and heads of departments, with an estimated sample size of approximately 276 individuals. The analysis was conducted using SPSS software to test the hypotheses. The findings indicate a significant positive effect of digital transformation across its various dimensions in lowering costs within these companies. Consequently, the study recommends that Jordanian industrial firms invest in the necessary components to foster and enhance a digital culture within their organizations.

KEYWORDS: Digital Transformation, Digital Processes, Operational Efficiency, Cost Reduction, Public Sector Innovation, Industrial Digitization And Digital Business Model

1. INTRODUCTION

The world has increasingly embraced digital transformation, driving innovation and operational efficiency across various sectors. Consequently, for organizations aiming to remain competitive, transitioning from traditional business models to digital ones has become essential. As noted by Martínez-Peláez (2023), digital transformation enables businesses to adapt to technological advances, using digital tools to enhance performance, improve customer service, and create new business models. In particular, industrial companies in Jordan's public sector have shown growing interest in digital transformation as they strive to reduce production costs while maintaining operational efficiency. Given these circumstances, many organizations are developing comprehensive strategies to bridge the gap between developed and developing nations and sustain their economic growth.

This study specifically focuses on Jordanian public joint-stock industrial companies, which are continually seeking ways to reduce production costs. By adopting digital transformation, these companies aim to enhance operational efficiency, streamline processes, and remain competitive in an increasingly digitized global economy. The COVID-19 pandemic, which forced organizations to adopt new technologies to maintain business continuity, further underscored the need for digital transformation. Feliciano-Cestero (2023) emphasizes that digital transformation not only supports the sustainability of business operations but also contributes to achieving broader sustainable development goals. Despite this positive outlook, a gap remains in understanding how digital transformation can specifically impact cost reduction in public sector industrial companies. While many studies, such as those by Liere-Netheler et al. (2018) and Omol (2023), have highlighted the overall benefits of digital transformation in business environments, few have explored its direct relationship with cost management in Jordan's public sector. Therefore, this study seeks to investigate how digital technologies can reduce costs and improve operational practices in this sector, focusing on the implications for resource management and overall business performance. This investigation will address the following research questions:

1. How does digital transformation affect cost reductions in Jordanian public-sector industrial companies?
2. What are the main barriers to implementing digital transformation in these companies?
3. How do digital business models enhance operational efficiency and customer service in this sector?

The Jordanian public sector, particularly its industrial companies, faces significant pressure to reduce costs and improve operational efficiency. In recent years, these companies have encountered challenges related to outdated infrastructure, high production costs, and increased competition. As a result, the need for more efficient cost management strategies has become a critical concern, driving many companies to explore digital solutions that can streamline operations and optimize resource utilization. As noted by Guo and Xu (2021), the adoption of digital transformation can lead to significant improvements in operational performance, particularly in sectors where efficiency and cost control are paramount. Digital transformation, defined as the integration of modern digital technologies into business processes, offers numerous advantages to companies. For instance, it enables the use of smartphones, social media, and embedded devices to improve customer service, streamline operations, and create innovative business models. By adopting digital transformation, Jordanian public sector industrial companies can reduce the cost of delivering products and services through traditional methods while maintaining product quality and operational efficiency (Guerra et al., 2023). However, the adoption of digital transformation in the public sector faces several barriers, including limited funding, outdated technological infrastructure, and resistance to change. In this regard, Hautala-Kankaanpää (2022) highlights the importance of digital culture and organizational knowledge in facilitating the digitization process. Therefore, companies that fail to adapt to these changes risk falling behind in an increasingly competitive global market. Therefore, this study aims to fill this research gap by examining how digital transformation can overcome these barriers and contribute to cost reduction in Jordanian public sector industrial companies.

Cost management is crucial for public sector industrial companies, especially in Jordan, where budget constraints and resource limitations are common. To address these challenges, effective cost management strategies help companies maintain profitability and ensure sustainable operations. In this context, digital transformation offers a pathway to improved cost management by automating processes, reducing duplication of work, and enhancing transparency across departments. Ultimately, by implementing digital technologies,

companies can better manage their resources, reduce production costs, and improve overall business performance (Alshawabke & Khatib, 2022). As digital transformation becomes more prevalent, companies can leverage digital business models to streamline operations, reduce costs, and enhance customer experiences. In fact, Fischer et al. (2020) note that one of the primary goals of digital transformation is to increase operational efficiency by optimizing the use of information technology. Consequently, this reduces the time, effort, and costs associated with traditional business processes while maintaining high-quality standards. Additionally, Chwiłkowska-Kubala (2023) suggests that digital transformation can simplify manufacturing work by eliminating redundancies and providing real-time data to employees and suppliers, thereby enhancing operational transparency.

Overall, digital transformation plays a pivotal role in improving operational practices by enabling companies to adopt more agile and efficient business models. As pointed out by Omol (2023), digital technologies have revolutionized the way businesses operate, forcing companies to rethink their traditional approaches to production and service delivery. By integrating digital tools, public sector industrial companies in Jordan can achieve higher levels of innovation, leading to faster product delivery, reduced costs, and improved operational efficiency. In a related study, Khatib and Alshawabkeh (2022) found that digital transformation positively impacts companies' strategic operations within the Palestinian telecommunications sector. This finding is particularly relevant to Jordan's public sector industrial companies, where digital transformation can lead to improved cost management and better alignment with strategic objectives. Therefore, by adopting digital business models, these companies can optimize their use of resources, reduce operational costs, and enhance customer satisfaction.

The primary objective of this study is to assess the impact of digital transformation on cost reduction in Jordanian public-sector industrial companies. Specifically, the research seeks to determine how digital technologies can enhance operational efficiency, streamline processes, and reduce production costs in this sector. In pursuit of this goal, the study aims to provide practical insights into the challenges and opportunities associated with digital transformation, offering recommendations for companies looking to implement these technologies effectively. Research on the specific impact of digital transformation on cost reduction in Jordan's public sector industrial companies is lacking, despite the widespread recognition of its benefits. While existing studies have predominantly explored the general advantages of digital transformation, such as improved customer service and operational efficiency (Liere-Netheler et al., 2018), few have examined the direct relationship between digital transformation and cost management in the context of the public sector. Thus, this study seeks to address this gap by investigating how digital transformation can reduce production costs and enhance operational practices in Jordan's public sector industrial companies.

In summary, digital transformation offers significant potential for cost reduction and operational efficiency in Jordanian public-sector industrial companies. By leveraging digital technologies, these companies can streamline their processes, reduce production costs, and enhance their overall business performance. However, to fully realize the benefits of digital transformation, we must address challenges such as limited funding and outdated infrastructure. Ultimately, this study aims to contribute to the existing body of knowledge by providing practical insights into the role of digital transformation in cost management and offering recommendations for companies looking to adopt these technologies. This research will contribute to a broader understanding of digital transformation's impact on public sector industrial companies, particularly in Jordan.

2. LITERATURE REVIEW

Digital transformation encompasses a variety of strategies that organizations employ to integrate digital technologies into their operations. As noted by Martínez-Peláez et al. (2023), organizations are increasingly motivated to shift from traditional to digital operations due to the numerous advantages digital transformation offers, such as enhanced performance and value creation. Moreover, a comprehensive business strategy must align with economic and social development goals, particularly in narrowing the gap between developed and developing countries (Martínez-Peláez et al., 2023). Additionally, Albukhitan (2020) underscores that developing a digital transformation strategy is essential for manufacturing firms to remain competitive in a rapidly evolving market. Feliciano-Cestero et al. (2023) have emphasized the positive impact of digital transformation during the COVID-19 pandemic, emphasizing its role in sustaining economic activities. This study underscores the need for organizations to implement digital solutions as a

proactive response to global disruptions, thereby reaffirming the critical importance of digital transformation in achieving Sustainable Development Goals. Such positioning marks digital transformation as a vital component of contemporary business strategies (Feliciano-Cestero et al., 2023).

Cost reduction remains a primary objective for organizations in the Jordanian industrial sector, particularly within public joint-stock companies. These companies continuously seek methods to minimize production costs while maintaining quality, as emphasized by Akeem (2017). Digital transformation is defined as the integration of modern digital tools—such as smartphones, social media, and embedded devices—aimed at improving business performance, enhancing customer service, and streamlining operations (Liere-Netheler et al., 2018). The literature indicates that companies adopting digital technologies can significantly reduce costs associated with traditional operational methods, thereby improving their competitiveness (Liere-Netheler et al., 2018). Furthermore, Guerra et al. (2023) support this assertion, indicating that digital transformation not only aids in maintaining market share but also enhances profit margins. By adopting digital channels for product distribution, companies can effectively reduce costs while preserving the quality of their offerings (Guerra et al., 2023). This perspective aligns with Dahooie et al. (2020), who emphasize the importance of integrating cost reduction strategies in supply chain management to achieve optimal outcomes.

Operational efficiency is another critical aspect of digital transformation, as organizations strive to optimize resource utilization and improve productivity. Digital technologies create opportunities for better communication and collaboration, enabling companies to achieve their strategic goals more effectively (Hansen, 2009). Alshawabkeh and Khatib (2022) assert that digital transformation facilitates faster communication with stakeholders, including government and private entities, thus improving overall business performance. The findings by Guo and Xu (2021) reinforce the connection between digital transformation and operational performance, demonstrating a positive relationship between digital transformation intensity and operational performance among 2,254 manufacturing enterprises in China. Moreover, Khatib and Alshawabkeh (2022) reveal that digital transformation positively impacts business strategies, particularly in enhancing customer experiences and operational efficiency within telecommunications companies in Palestine. In addition, Hautala-Kankaanpää (2022) highlights the importance of organizational culture in the digital transformation process, emphasizing that a strong digital culture can significantly impact an organization's capacity to adapt to new technologies, further enhancing operational efficiency and supply chain management.

Despite the growing body of literature on digital transformation, specific gaps remain that this study aims to address. First, there is limited research focusing on the impacts of digital transformation within public sector industrial companies in Jordan (Kraus et al., 2022). While many studies explore the benefits of digital transformation across various sectors, the unique challenges and opportunities within the Jordanian context require further exploration. Additionally, as highlighted by Zhang and Peng (2023), there is a lack of studies examining the effectiveness of various digital strategies in achieving cost efficiency. Understanding which strategies yield the best results for cost reduction is crucial for guiding organizations in their digital transformation efforts.

To enrich the literature review, it is essential to include studies from diverse contexts, particularly those offering contrasting viewpoints or findings. While many studies highlight the benefits of digital transformation, others may raise concerns about potential challenges, such as implementation costs or resistance to change (Tiutiunyk et al., 2021). By considering a broader range of perspectives, the literature review can provide a more nuanced understanding of digital transformation's impact on cost reduction. For instance, Tiutiunyk et al. (2021) explore the risks associated with digital transformation on macroeconomic stability, providing a cautionary perspective on its widespread adoption. Their findings underscore the need for organizations to carefully assess the potential risks and benefits of digital technologies, particularly in the context of broader economic implications. This critical assessment is further supported by Chwiłkowska-Kubala et al. (2023), who examine the role of readiness for digital transformation in the energy sector.

When discussing statistical improvements in digital transformation, it is critical to provide context for the figures mentioned. For instance, we must explain how we derived the "30% increase in competitiveness" and its significance within the study (Elia et al., 2021). Providing context ensures that readers can fully comprehend the implications of these statistics and their relevance to the research questions. To ensure coherence and relevance,

findings from the literature must explicitly align with the research questions of the study. By demonstrating how existing literature informs the current research context, the review will highlight the importance of digital transformation in addressing cost reduction challenges facing public sector industrial companies in Jordan (Omol, 2023). This alignment will strengthen the overall argument and underscore the relevance of the study's objectives. A critical assessment of the reviewed sources is essential to identify methodological weaknesses or biases that could affect the findings. For example, some studies may rely on small sample sizes or lack robust data collection methods, which could limit the generalizability of their conclusions (Kovács & Kot, 2017). By highlighting these limitations, the literature review can provide a more comprehensive critique of the existing research, ultimately enhancing the study's credibility and rigor.

In conclusion, the impact of digital transformation on cost reduction in public sector Jordanian industrial companies is a multifaceted issue that requires careful examination. This literature review has organized existing research thematically, highlighting key strategies, cost management techniques, and operational efficiency aspects. By providing background information on the Jordanian industrial sector, identifying gaps in the literature, and incorporating diverse perspectives, this review sets the stage for a deeper exploration of the subject. As organizations continue to navigate the challenges of digital transformation, understanding the implications for cost reduction and operational efficiency will be crucial for their success. Future research should focus on addressing the identified gaps, exploring the effectiveness of various digital strategies, and providing practical recommendations for organizations seeking to implement digital transformation effectively. Ultimately, the insights gained from this study can inform the strategic decisions of public sector industrial companies in Jordan as they strive for sustainable growth and competitiveness in the digital age.

The Resource-Capability Theory (RBV) and the Technology-Organization-Environment (TOE) framework provide an integrated analytical lens for understanding the impact of digital transformation dimensions on cost reduction. From the perspective of resource-capability theory, digital capabilities are rare, hard-to-imitate strategic resources that enable organizations to achieve operational efficiency by improving resource allocation and reducing waste, thereby lowering direct costs. While the TOE framework links these influences to the organizational and environmental context, explaining how they interact. Thus, the RBV theory complements the analysis of internal resources, while the TOE framework provides a holistic view of external and internal factors, demonstrating how these dimensions together form an integrated system for achieving cost savings.

3. HYPOTHESIS DEVELOPMENT

The exploration of digital transformation's impact on cost reduction in public sector industrial companies, particularly within Jordan, reveals significant gaps in the existing literature. Specifically, while a wealth of research has focused on digital transformation in various sectors, insights into its implications for cost management in public sector industrial contexts remain limited. This lack of targeted research, therefore, hinders the understanding of how digital initiatives can effectively contribute to operational efficiencies and cost savings (Akeem, 2017; Chen & Xu, 2023).

Consequently, it is crucial for policymakers and industry leaders to recognize these gaps in order to leverage digital transformation effectively. By acknowledging the potential for digital processes, business models, and customer engagement strategies to enhance cost efficiency, they can make informed decisions that promote economic growth and sustainability within the industrial sector (Albukhitan, 2020; Tiutiunyk et al., 2021). For instance, understanding the mechanisms through which digital transformation reduces costs could lead to more strategic investments in technology and digital infrastructure, ultimately fostering a more competitive environment (Hansen, 2009; Weking et al., 2020).

Furthermore, addressing these gaps will not only advance academic discourse but will also enhance comprehension of the economic impacts of digital initiatives. Such insights are crucial for guiding future investments and strategies in the public sector, as they can illuminate best practices for implementing digital transformation (Martínez-Peláez et al., 2023; Feliciano-Cestero et al., 2023). Thus, this research aims to provide a comprehensive examination of how various aspects of digital transformation influence cost reduction in Jordanian public joint stock industrial companies, thereby laying the groundwork for future studies in this area (Kraus et al., 2022). Therefore, we have the main hypotheses:

There is no statistically significant impact at the level of significance ($0.05 \geq \alpha$) of digital

transformation—comprising digital processes, digital business models, impact on individuals, and digital customer activities—on cost reduction in Jordanian public joint stock industrial companies.

In this context, the first sub-hypothesis focuses on digital operations, which are fundamental components of digital transformation. Digital technologies, as a result, have the potential to streamline processes and significantly improve operational efficiency. For instance, automation of routine tasks reduces the time and labor required for various functions, which in turn leads to lower operational expenses (Dahooie et al., 2020; Kovács & Kot, 2017). In public-sector industrial companies, where budget constraints are common, such efficiencies can have substantial implications for cost management.

Moreover, by implementing digital operations, companies can also optimize resource allocation. For example, advanced analytics and data-driven decision-making enable organizations to allocate resources more effectively, minimizing waste and maximizing output (Guerra et al., 2023; Liere-Netheler et al., 2018). This transformation is essential in an industrial context, especially where operational costs can heavily impact overall financial performance. As a result, examining the relationship between digital operations and cost reduction is vital for understanding how these technologies can contribute to financial health in Jordanian public joint stock industrial companies. Therefore, we have the main hypotheses:

H01: There is no statistically significant effect at a significant level ($0.05 \geq \alpha$) of digital operations on cost reduction in Jordanian public joint stock industrial companies.

Additionally, the second sub-hypothesis centers on the digital business model, which plays a crucial role in how organizations deliver value and manage costs. The digital business model offers innovative approaches to service delivery, therefore allowing companies to rethink traditional practices and explore new avenues for cost management (Stich et al., 2020; Elia et al., 2021). By integrating digital technologies into their business models, companies can enhance customer experiences and operational efficiencies simultaneously.

For instance, a digital business model may involve leveraging online platforms to deliver services, thereby reducing the need for physical infrastructure and associated costs (Khatib & Alshawabkeh, 2022; Chwiłkowska-Kubala et al., 2023). In addition, these models often incorporate data analytics to drive insights into customer behavior, enabling more effective targeting and personalized offerings. This can lead to higher customer satisfaction and retention. Hence, this innovative approach to business can result in significant reductions in operational costs and improved profitability, making it imperative to investigate its impact on cost reduction in Jordanian public joint stock industrial companies. Therefore, we have the main hypotheses:

H02: There is no statistically significant effect at a significant level ($0.05 \geq \alpha$) of the digital business model in reducing costs in Jordanian public joint stock industrial companies.

Furthermore, the third sub-hypothesis addresses the impact of digital transformation on individuals within organizations. Employee engagement and training in digital initiatives are crucial for the successful adoption of new technologies (Omol, 2023; Fischer et al., 2020). When employees are actively involved in digital transformation efforts, they are more likely to embrace new tools and processes, leading to enhanced productivity.

Consequently, increased productivity can lead to reduced operational costs. Employees who are skilled in using digital tools can perform their tasks more efficiently, contributing to overall cost savings for the organization (Guerra et al., 2023; Stich et al., 2020). Moreover, digital initiatives that engage and empower employees encourage them to contribute innovative ideas that can enhance processes and further reduce costs. As a result, it is critical to examine how the impact on individuals affects cost reduction in Jordanian public joint stock industrial companies.

H03: There is no statistically significant effect at a significant level ($0.05 \geq \alpha$) of the impact on individuals in reducing costs in Jordanian public joint stock industrial companies.

In addition, the fourth sub-hypothesis focuses on digital customer activities and their potential to influence cost reduction. With the rise of fintech solutions and digital platforms, organizations can enhance financial efficiency and transparency in their operations. In doing so, these solutions can minimize transaction costs and streamline financial processes, leading to overall cost savings (Chen & Xu, 2023; Martínez-Peláez et al., 2023).

For example, digital payment systems can reduce the costs associated with traditional payment methods, such as cash handling and manual processing (Khatib & Alshawabkeh, 2022; Tiutiunyk et al., 2021). Moreover, engaging customers through digital channels allows companies to gather valuable data on customer preferences and behaviors, enabling them to tailor their offerings and reduce

costs related to customer acquisition and retention. Thus, understanding the role of digital customer activities in cost reduction is vital for identifying effective strategies that can be employed by Jordanian public joint stock industrial companies.

H04: There is no statistically significant effect at a significant level ($0.05 \geq \alpha$) of digital customer activities in reducing costs in Jordanian public joint stock industrial companies.

Finally, the last sub hypothesis emphasizes the importance of leadership support in driving successful digital transformation initiatives. Leadership plays a critical role in the successful implementation of digital initiatives, as it influences organizational culture, resource allocation, and employee engagement (Guerra et al., 2023; Feliciano-Cestero et al., 2023). In this regard, strong leadership can foster a culture that prioritizes innovation and digital adoption, which is essential for achieving cost reduction outcomes.

When leaders actively support digital transformation, they set a tone that encourages employees to embrace new technologies and methodologies (Fischer et al., 2020; Liere-Netheler et al., 2018). This support can include providing the necessary training and resources for employees to adapt to digital tools effectively. Additionally, leadership involvement in digital initiatives can lead to more strategic decision-making and prioritization of projects that align with cost reduction goals. Therefore, exploring the relationship between leadership support and cost reduction in Jordanian public joint-stock industrial companies is crucial for understanding the dynamics that influence successful digital transformation efforts.

H05: There is no statistically significant effect at a significant level ($0.05 \geq \alpha$) of leadership support for digital transformation initiatives on cost reduction outcomes in Jordanian public joint stock industrial companies.

The following Figure shows the Relationship between the Study Variables.

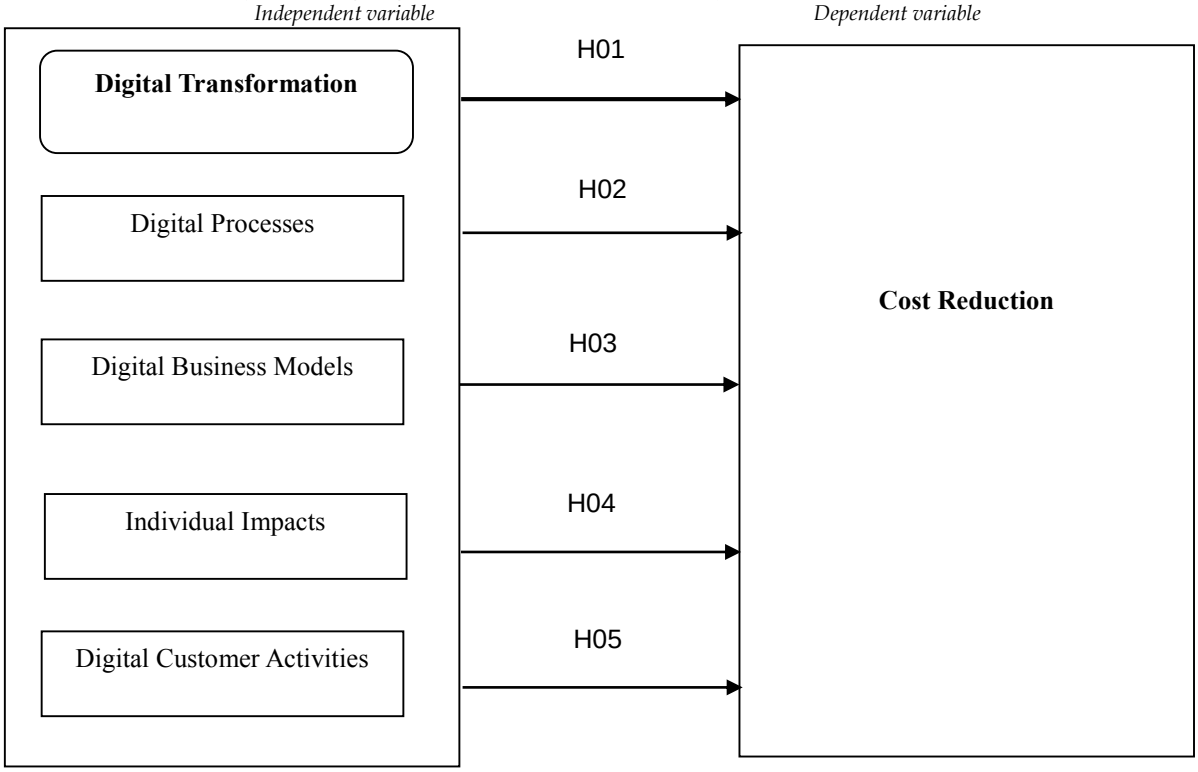

Figure 1: Study Model.

In conclusion, this research aims to address the identified gaps in the literature regarding the relationship between digital transformation and cost reduction in Jordanian public joint stock industrial companies. By examining the main hypothesis and its sub-hypotheses, the study seeks to provide a comprehensive understanding of how various elements of digital transformation can contribute to operational efficiencies and cost savings.

Although current literature focuses on the benefits of digital transformation in the private sector or advanced economies, there remains a clear research gap in understanding its effects on cost reduction in public sector industrial firms, especially

in developing contexts such as Jordan. These companies face unique challenges, such as traditional infrastructure, limited funding, and a stringent regulatory environment, making the findings of previous studies not directly applicable. Therefore, this study contributes to bridging this gap by providing an in-depth analysis of how the four dimensions of digital transformation (digital processes, digital business models, individual impacts, digital customer activities) interact with these local characteristics to achieve cost reduction, which has not been sufficiently explored in the current literature.

Through this exploration, the research will offer valuable insights for policymakers and industry leaders, highlighting the significance of digital transformation as a catalyst for cost reduction and improved organizational performance (Martínez-Peláez et al., 2023; Chen & Xu, 2023). Ultimately, by shedding light on these dynamics, this study aims to contribute to the body of knowledge surrounding digital transformation in the public sector, thereby guiding future strategies and investments in technology and innovation (Akeem, 2017; Elia et al., 2021).

4. STUDY METHODOLOGY

This study employed a descriptive-analytical approach to investigate the impact of digital transformation on cost reduction in Jordanian public joint stock industrial companies. This methodology effectively described the phenomenon under investigation, enabling a thorough analysis of the correlations and impacts among the variables within the study environment while facilitating a deeper understanding of the underlying dynamics. While other quantitative approaches may provide advanced statistical analyses, the descriptive-analytical approach offers the unique advantage of its ability to explore complex relationships between study variables in their natural context without the need for strict experimental controls. This is perfectly in line with the nature of the study, which aims to understand the impact of digital transformation on cost reduction in a natural, untested environment, where Jordanian industrial companies operate under complex and interconnected real-world conditions.

Data were collected using a well-structured electronic questionnaire, specifically designed to gather insights from senior management personnel across the sector. The target population consisted of 46 industrial companies listed on the Amman Stock Exchange, spanning nine distinct industrial sectors. The researcher adopted a comprehensive survey strategy to define the study sample, ensuring the inclusion of all companies constituting the study community, which amounted to approximately 276 individuals, and this is a purposive sample. The analysis focused on individuals occupying senior and middle management positions, specifically targeting job titles such as General Manager, Deputy General Manager, Department Manager, and Department Head.

Jordan's public sector industrial companies provide a unique and significant context for examining the impact of digital transformation on cost reduction. This context is shaped by several critical factors. Firstly, these companies grapple with escalating economic pressures and tight budget constraints, compelling a keen focus on cost reduction strategies. In response, the Jordanian government seeks to enhance efficiency and productivity across various sectors, positioning digital transformation as a vital tool for achieving these goals. The integration of digital technologies can streamline operations, minimize waste, and reduce costs, highlighting the necessity of exploring how these transformations positively affect financial performance within the public sector. Furthermore, the Jordanian government has prioritized the modernization of its public sector, launching initiatives aimed at bolstering transparency, efficiency, and service delivery. Robust regulatory frameworks, established to support these efforts, facilitate the adoption of digital technologies across diverse sectors. This governmental push not only promotes the digital transformation of industrial companies but also encourages these organizations to explore innovative strategies for improving their operational processes and cost structures.

Digital transformation also presents substantial opportunities for enhancing operational efficiency within public-sector industrial companies. By leveraging technologies such as automation, data analytics, and cloud computing, these companies can optimize their processes, improve resource allocation, and reduce downtime. This transformation allows for a comprehensive reassessment of existing practices while fostering a culture of continuous improvement, emphasizing the importance of investigating how digital initiatives can yield significant cost reductions. Moreover, amidst globalization and competitive pressures, public-sector industrial companies in Jordan must bolster their competitiveness to sustain growth and profitability. In this context, digital transformation offers a viable pathway for these organizations to innovate and adapt to shifting market dynamics. By

examining the impact of digital initiatives on cost reduction, this study aims to uncover valuable insights into how these companies can strengthen their competitive positioning while navigating an increasingly challenging landscape. Additionally, the integration of digital technologies necessitates a skilled workforce capable of effectively utilizing these tools. As a result, the digital transformation process creates opportunities for capacity building and skills development, which are critical for successful implementation and cost reduction. Understanding how these initiatives can lead to both employee development and organizational cost savings is essential for informing future strategies in this sector. In summary, Jordan's public sector industrial companies present a compelling context for this study due to their economic pressures, supportive regulatory environment, opportunities for operational efficiency, the need for enhanced competitiveness, and potential for capacity building. By exploring the impact of digital transformation on cost reduction within this framework, the study aims to provide valuable insights that can guide strategies for improving efficiency, minimizing costs, and driving sustainable growth in the public sector. Consequently, this research holds the potential to significantly influence the operational strategies of Jordan's industrial sector.

4.1. Reliability Test

The reliability of the study tool was confirmed by using Cronbach's Alpha Coefficient for all dimensions and variables and for the study tool as a whole. This test aims to determine the validity and reliability of the tool for measurement. Cronbach's alpha coefficient ranges from (0) as the lowest value to (1) as the highest value. A Cronbach's coefficient value of (0.70) or greater indicates high stability and reliability of the study tool, and a coefficient value close to (1) indicates high degrees of stability of the study tool (Sekaran & Bougie, 2016). The following table shows the results of the study tool's stability, as follows:

Table 1: Cronbach's Alpha Test Results.

No.	Variable	Number of paragraphs	Cronbach's Alpha Coefficient
1	Digital Operations	5	0.690
2	Digital Business Model	5	0.669
3	Impact on Individuals	5	0.709
4	Digital Customer Activities	5	0.691
5	Digital Transformation	20	0.896
6	Cost Reduction	10	0.824
7	Study tool	30	0.927

The results of Table 1 show that the values of the Cronbach's alpha test coefficient for the paragraphs of the study tool ranged between (0.669-0.896), and the total value of the study tool as a whole reached (0.927). It is clear from the table that all values are greater than the value (0.70), and this indicates consistency between the paragraphs of the study tool and its reliability and the possibility of relying on it to complete the statistical analysis.

4.2. Statistical Analysis and Study Results

The analysis was conducted using SPSS software to test the hypotheses. To evaluate the suitability of the study model regarding the impact of digital transformation on cost reduction in public sector Jordanian industrial companies, a Pearson correlation coefficient correlation matrix was employed. This analysis aimed to identify any potential linear multicollinearity among the independent variables, which include digital operations, digital business model, impact on individuals, and digital customer activities. By examining the correlations among these variables, the study sought to understand their interrelationships and assess how effectively they contribute to the overall impact of digital transformation on cost reduction. This methodological approach not only facilitated the detection of potential issues related to multicollinearity but also provided insights into the dynamics between digital transformation elements and their effect on operational efficiency. The findings, detailed in Table 2, reveal significant interrelationships among these variables. Notably, the correlation coefficient between the digital business model and its impact on individuals is the highest at 0.728, signifying a strong positive relationship. This correlation suggests that as companies enhance their digital business models, they are likely to observe a corresponding positive effect on individual outcomes within the organization. Other notable correlations include values of 0.643 and 0.646 between digital operations and digital customer activities, respectively, indicating robust connections among these factors as well.

Table 2: Pearson Coefficients Correlation Matrix.

Variable	Digital Operations	Digital Business Model	Impact on Individuals	Digital Customer Activities
Digital Operations	1			
Digital Business Model	0.615**	1		
Impact on Individuals	0.626**	0.728**	1	
Digital Customer Activities	0.643**	0.646**	0.699**	1

Importantly, all correlation coefficients fall below the commonly used threshold of 0.80, indicating the presence of multicollinearity. The fact that the independent variables didn't show any significant multicollinearity supports the validity of the statistical methods used in the study. This lets us get a better idea of how digital transformation and cost reduction are related. Thus, the Pearson correlation analysis confirms that digital transformation initiatives encompassing various dimensions do not exhibit overlapping influences that could bias the study's findings. The insights gleaned from this analysis serve as a critical foundation for further exploring how these digital initiatives can effectively drive cost reduction in the context of public sector industrial operations in Jordan, ultimately contributing to enhanced efficiency and competitiveness in the marketplace.

Further validation of the absence of multicollinearity among the independent variables was achieved through the application of the Variance Inflation Factor (VIF) test and the Tolerance variance test, the results of which are summarized in Table 3. The VIF values for the independent variables—digital operations, digital business model, impact on individuals, and digital customer activities—ranged from 2.000 to 2.725. These values fall within the acceptable range of 1 to 10, indicating that multicollinearity is not a concern for this study. In addition, the Tolerance values, which ranged from 0.367 to 0.500, further corroborate this finding, as they are well within the acceptable limits of 0.1 to 1.

Table 3: VIF and Tolerance Values for Independent Variables.

Variable	VIF	Tolerance
Digital Operations	2	0.5
Digital Business Model	2.423	0.413
Impact on Individuals	2.725	0.367
Digital Customer Activities	2.35	0.426

This analysis confirms that each independent variable contributes uniquely to the model without significant overlap or influence from others, which is crucial for ensuring the reliability of the results in assessing the impact of digital transformation on cost reduction. In the context of public sector Jordanian industrial companies, these findings suggest that digital transformation initiatives, whether through improved digital operations, innovative business models, or enhanced customer activities, can be evaluated independently in their effects on operational efficiency and cost management. The lack of multicollinearity ensures that the relationships identified in the study reflect true associations rather than confounding effects among the variables. Consequently, the insights drawn from this robust analytical framework can guide public sector organizations in Jordan as they implement digital transformation strategies aimed at achieving cost reductions, thereby enhancing overall performance and sustainability in a competitive industrial landscape. This comprehensive understanding of the dynamics at play will support decision-makers in prioritizing digital initiatives that can lead to tangible cost-saving benefits.

The study examined the impact of digital transformation on cost reduction in public sector Jordanian industrial companies, focusing on two primary variables: the independent variable, digital transformation, and the dependent variable, cost reduction. We operationalized digital transformation through four distinct sub-variables: digital processes, digital business model, impact on individuals, and digital customer activities. We developed and administered a questionnaire comprising 30 items to gauge the extent of interest in these variables among Jordanian industrial companies. Table 4 summarizes the findings by presenting the general arithmetic means, standard deviations, ranks, and relative importance of the study variables. Overall, the results indicate a high level of interest in digital transformation, with a mean score of 3.744 and a standard deviation of 0.578. Each of the sub-variables also displayed high mean scores, indicating significant engagement from the surveyed companies. Notably, digital operations achieved the highest mean score of 3.794, reflecting a strong commitment to enhancing operational efficiencies through digital means. Despite its value, the digital business model received the lowest mean score of 3.723, suggesting potential for further development

and implementation. The other sub-variables, including the impact on individuals (3.725) and digital customer activities (3.736), further reinforce the recognition of these aspects of digital transformation as significant.

Table 4: Description of Study Variables.

Variable	N	General Arithmetic Mean	Standard Deviation	Rank	Relative Importance
Digital Operations	30	3.794	0.649	1	High
Digital Business Model	30	3.723	0.651	4	High
Impact on Individuals	30	3.725	0.677	3	High
Digital Customer Activities	30	3.736	0.689	2	High
Digital Transformation		**3.744**	**0.578**		High
Cost Reduction		**3.751**	**0.64**		High

In terms of cost reduction, the study revealed a mean score of 3.751 and a standard deviation of 0.640, underscoring a significant interest among the companies in exploring how digital transformation can lead to enhanced efficiency and reduced costs. This dual focus on digital transformation and cost reduction suggests that organizations are increasingly recognizing the interconnection between technological advancements and financial performance. The study's results are also supported by the fact that the independent variables did not have multicollinearity, which was shown by the VIF and tolerance variance tests. The VIF values ranged from 2.000 to 2.725, while tolerance values ranged from 0.367 to 0.500, both indicating that the independent variables can be considered distinct and contribute uniquely to the overall model. Overall, these findings suggest that Jordanian industrial companies are poised to leverage digital transformation as a strategic approach to cost reduction, enhancing their operational effectiveness and ensuring sustainability in an increasingly competitive landscape. This comprehensive understanding will aid decision-makers in prioritizing digital initiatives that align with their cost-saving objectives while fostering a culture of innovation and adaptability.

The study investigated the impact of digital transformation and its associated variables digital processes, digital business model, impact on individuals, and digital customer activities on cost reduction in Jordanian industrial companies. To test the formulated hypotheses, multiple linear regression analysis was employed, providing insights into the relationship between the independent and dependent variables. The results are summarized in Table 5, which highlights the model's effectiveness in explaining cost reduction outcomes. The model summary reveals a significant correlation, with an R value of 0.819, indicating a strong positive relationship between digital transformation initiatives and cost reduction.

The R^2 value of 0.671 suggests that 67.1% of the variance in cost reduction can be attributed to digital transformation efforts. This substantial explanatory power underscores the importance of embracing digital strategies within these companies to achieve meaningful cost efficiencies.

Table 5: Main Hypothesis Test Results.

Dependent Variable	Model Summary	Variance Analysis
	R	R^2
Cost Reduction	0.819	0.671

Additionally, the F value of 113.093, coupled with a significance level (SigF) of 0.000—well below the threshold of 0.05 further supports the robustness of the model.

This finding indicates that the overall model is statistically significant and that the digital transformation variables are essential contributors to cost reduction in the context of Jordanian industrial companies. Collectively, these results suggest that prioritizing digital transformation can lead to enhanced operational efficiencies and substantial cost savings, providing a compelling case for public sector industrial companies to invest in digital initiatives as a means of fostering financial sustainability and competitive advantage.

The study conclusively establishes that digital transformation has a statistically significant impact on cost reduction in Jordanian public joint stock industrial companies, rejecting the main null hypothesis.

The alternative hypothesis posits that digital transformation including digital processes, digital business models, impact on individuals, and digital customer activities significantly affects cost

reduction at the 0.05 significance level. The results shown in Table 6 show that all the parts of digital transformation have a big effect on lowering costs. This is because each independent variable has a p-value below the 0.05 level, which means it is statistically significant. The coefficients (B) reflect the degree of impact each variable has on cost reduction. Notably, digital operations show a coefficient of 0.191, suggesting that a one-unit increase in digital processes is associated with a 0.191 increase in cost reduction, corroborating the idea that enhancing digital operations can lead to improved efficiency and reduced operational costs.

Table 6: Sub-Hypothesis Test Results.

Independent Variables	Coefficients (B)	Standard Error	Calculated T	Sig (T)
Digital Operations	0.191	0.054	3.559	0
Digital Business Model	0.153	0.059	2.597	0.01
Impact on Individuals	0.206	0.06	3.424	0.001
Digital Customer Activities	0.347	0.055	6.337	0
Slope Constant	0.391	0.164	2.385	0.018

The digital business model also contributes significantly to cost reduction, with a coefficient of 0.153, indicating that strategic digitalization of business models can yield measurable cost benefits. The impact on individuals, with a coefficient of 0.206, underscores the importance of employee engagement and skill development in the digital transformation process.

This highlights how empowering individuals within the organization can lead to more effective implementation of digital initiatives, further facilitating cost reduction. However, the most substantial impact is observed in digital customer activities, which exhibit a coefficient of 0.347. This finding emphasizes the critical role of engaging customers through digital channels, suggesting that improved customer interaction and satisfaction can directly lead to reduced costs, possibly through enhanced loyalty and decreased customer acquisition costs. Overall, these results illuminate the multifaceted benefits of digital transformation in Jordanian industrial companies.

The strong coefficients and low p-values across all variables highlight the necessity for these companies to invest in digital strategies, as they not only promote operational efficiencies but also foster a culture of innovation and responsiveness to market demands.

The findings advocate for a systematic approach to integrating digital processes, refining business models, investing in human capital, and enhancing customer engagement as essential strategies for achieving significant cost reductions and fostering long-term sustainability in the competitive industrial landscape. To further understand the influence of digital transformation variables on cost reduction in Jordanian public joint stock industrial companies, a stepwise linear regression analysis was conducted. The results, summarized in Table 7, reveal a clear hierarchy of the variables in terms of their impact on cost reduction.

The analysis indicates that digital customer activities hold the highest importance in driving cost reduction, with a B value of 0.698 and a calculated T value of 17.087 (Sig (T) = 0.000). This substantial coefficient suggests that enhancing customer engagement through digital platforms not only fosters better relationships but also significantly reduces operational costs, likely through streamlined customer interactions and increased customer loyalty.

The high R value of 0.752 and R^2 of 0.565 further demonstrate that a significant portion of the variance in cost reduction can be attributed to digital customer activities, confirming their critical role in the overall digital transformation strategy.

The second model confirms the continuing importance of digital customer activities, with a B value of 0.458 and a T value of 8.729 (Sig (T) = 0.000). This reinforces the notion that a focus on customer-centric digital solutions is essential for achieving cost efficiencies. In this context, the impact on individuals emerges as the next most influential variable, contributing a B value of 0.349 and a T value of 6.524 (Sig (T) = 0.000).

This result emphasizes the necessity of training and empowering employees as organizations undergo digital transformation. When individuals are well-equipped with the skills to leverage digital tools, they can optimize processes and enhance productivity, directly impacting cost reduction.

Table 7: Ranking Of Digital Transformation Variables by Importance and Impact on Cost Reduction.

Model	Digital Transformation Variables	B Value	T Calculated	Sig (T)	R	R^2	Calculated F	Sig (F)
1	Digital Customer Activities	0.698	17.087	0.000	0.752	0.565	291.972	0.000
2	Digital Customer Activities	0.458	8.729	0.000	0.796	0.634	194.233	0.000
	Impact on Individuals	0.349	6.524	0.000				
3	Digital Customer Activities	0.375	6.872	0.000	0.813	0.661	144.813	0.000
	Impact on Individuals	0.275	5.05	0.000				
	Digital Operations	0.222	4.177	0.000				
4	Digital Customer Activities	0.347	6.337	0.000	0.819	0.671	113.093	0.000
	Impact on Individuals	0.218	3.424	0.001				
	Digital Operations	0.177	3.008	0.004				

In subsequent models, digital operations also demonstrate significance, with a B value of 0.222 and a T value of 4.177 (Sig (T) = 0.000). This highlights that operational efficiencies gained through digital initiatives can significantly contribute to overall cost reduction. Notably, the regression models consistently indicate that digital customer activities and impact on individuals remain pivotal throughout the analysis. The calculated F values and their significance levels further validate the robustness of the models. For example, the model with the highest significance (F = 291.972, Sig (F) = 0.000) highlights the overall effectiveness of these digital transformation variables in influencing cost outcomes. Collectively, these findings underscore the necessity for Jordanian industrial companies to prioritize digital customer engagement strategies while simultaneously investing in their workforce. This multifaceted approach is crucial for realizing substantial cost reductions and achieving long-term operational sustainability within the increasingly competitive industrial sector. Ultimately, this analysis serves as a compelling call for companies to embrace digital transformation as a strategic imperative, aligning their operational and customer engagement efforts to drive significant cost efficiencies.

5. DISCUSSION

These study's results, which look at the coefficients of different independent variables that affect digital transformation and cost reduction in public sector industrial companies, give us important information about how digital transformation works. Digital operations, with a coefficient of 0.191, demonstrate a positive relationship with cost reduction, aligning with Akeem (2017), who emphasized the importance of effective cost control and reduction techniques in enhancing organizational performance. Similarly, the digital business model, with a coefficient of 0.153, reinforces Albukhitan's (2020) assertions that a robust digital business model contributes significantly to operational efficiency and cost savings.

The impact on individuals, with a coefficient of 0.206, resonates with the findings of Khatib and Alshawabkeh (2022), who highlighted the crucial role of employee engagement in successful digital transformation initiatives. Furthermore, digital customer activities, which have a coefficient of 0.347, highlight the increasing importance of customer interaction in cost reduction efforts, as noted by Chen and Xu (2023). Their research illustrates how enhanced digital customer activities can streamline operations and reduce unnecessary expenditures, making a compelling case for the integration of digital strategies in public sector organizations. These findings fill existing gaps in the literature by providing empirical evidence that directly connects digital transformation initiatives with tangible cost reduction outcomes. While previous studies have established a theoretical foundation, the current research underscores the necessity of adopting digital technologies to achieve operational efficiency

in the public sector (Gonçalves et al., 2022; Volodina & Grossi, 2024).

Despite the alignment with several studies, it is essential to acknowledge the contradictions that may arise when comparing these findings with previous research. Some studies, for instance, have reported minimal impacts of digital transformation on operational costs due to the initial investment and implementation costs associated with technology adoption (Hansen, 2009; Liere-Netheler et al., 2018). These discrepancies may stem from differences in methodologies, sample sizes, or regional influences that could affect the generalizability of the results (Fischer et al., 2020). For example, studies conducted in more technologically advanced regions might report different outcomes compared to those in developing areas, where infrastructure and resources may be limited (Elia et al., 2021; Omol, 2023). Moreover, the varying definitions of digital transformation across studies can lead to inconsistent findings. The impact of digital transformation is often context-dependent, influenced by the unique characteristics of the organizations involved and their readiness for such changes (Zhang & Peng, 2023). By providing a nuanced understanding of these contradictions, the current research contributes to a more comprehensive narrative on digital transformation's role in public sector organizations.

In addition to highlighting the positive effects of digital transformation, it is crucial to analyze the barriers hindering its adoption in public-sector industrial companies. We can categorize barriers to digital transformation into several types, including technological, financial, and managerial challenges. Technological barriers often encompass issues such as inadequate infrastructure and the complexity of integrating new systems with existing ones (Dahooie et al., 2020; Sepasgozar et al., 2022). For instance, organizations may struggle with outdated legacy systems that are incompatible with modern digital solutions, creating a significant obstacle to successful implementation. Financial barriers represent another critical challenge, as the initial investment required for digital transformation can be substantial. As noted by Datar and Rajan (2021), many public sector organizations operate under strict budget constraints, making it difficult to allocate sufficient resources for digital initiatives. Additionally, managerial barriers can include a lack of digital skills among staff, resistance to change, and insufficient leadership support (Martínez-Peláez et al., 2023). These barriers were evident in the data collected for this study, where several respondents highlighted the need for targeted training and support to facilitate the transition to digital operations. Addressing these barriers is essential for organizations to fully realize the benefits of digital transformation. By identifying and categorizing these obstacles, the current research contributes valuable insights that can inform future strategies for overcoming challenges and enhancing the effectiveness of digital initiatives (Tiutiunyk et al., 2021).

The findings of this study are particularly relevant in light of current trends in the public sector, such as the rise of remote work, increasing emphasis on employee well-being, and the impact of digital transformation on cost reduction. The COVID-19 pandemic has accelerated the shift towards remote work, requiring organizations to adopt digital solutions to sustain productivity (Larsson & Teigland, 2019). As a result, public sector organizations are increasingly investing in digital operations to facilitate remote work and enhance operational efficiency. Furthermore, the emphasis on employee well-being is becoming a critical consideration in organizational strategies. Digital transformation can play a vital role in supporting employee well-being by enabling flexible work arrangements and improving access to resources and support services (Guerra et al., 2023). The positive coefficient associated with the impact on individuals underscores the importance of considering employee perspectives in digital transformation initiatives. Finally, the relationship between digital transformation and cost reduction is increasingly significant in the current economic climate, where public sector organizations are under pressure to operate efficiently (Kraus et al., 2022). The results of this study contribute to our understanding of how digital initiatives can lead to cost savings, highlighting the potential for public sector industrial companies to leverage digital transformation as a strategic tool for reducing operational costs.

In conclusion, the current study provides valuable insights into the role of digital transformation in cost reduction within public sector industrial companies. By integrating existing literature, addressing contradictions, expanding the analysis of barriers, and connecting findings with current trends, this research contributes to a deeper understanding of the complexities surrounding digital transformation. The findings suggest that digital operations, business models, and customer activities positively impact cost reduction while also identifying critical barriers that organizations must overcome. As the public sector continues to navigate the challenges and opportunities presented by digital transformation,

the insights gained from this study can inform future strategies and initiatives aimed at enhancing operational efficiency and cost-effectiveness.

6. CONCLUSION

The investigation into digital transformation initiatives within public sector industrial companies in Jordan reveals a significant trend: these initiatives substantially reduce operational costs while enhancing overall productivity. These organizations can streamline their processes by adopting advanced technologies and digital tools, resulting in more efficient resource use and improved output. By focusing on various facets of digital transformation, the study highlights how these changes can drive measurable benefits in cost management and operational efficacy. The findings underscore a crucial point: digital transformation is not merely a technical endeavor; it is also a strategic necessity that can redefine the operational landscape of public sector organizations. As these companies adopt digital solutions, they find that their traditional operational models may no longer be sufficient to meet the demands of a rapidly evolving environment. This paradigm shift leads to an urgent need for process re-evaluation and the implementation of innovative practices that align with contemporary market conditions.

To capitalize on these findings, public sector companies in Jordan should consider implementing robust performance evaluation systems. These systems must incorporate specific key performance indicators (KPIs) that relate directly to cost efficiency. Organizations can more effectively monitor their progress toward cost reduction goals by establishing clear metrics to assess performance. Furthermore, these KPIs should not only reflect financial outcomes but also encompass qualitative aspects of performance, ensuring a holistic view of organizational health. Moreover, it is essential for public sector companies to enhance the alignment between their digital strategies and organizational objectives. This alignment fosters improved human resource management (HRM) practices, which are vital for sustaining the momentum of digital transformation initiatives. When employees understand how their roles contribute to broader organizational goals, they are more likely to embrace change and drive innovation. Therefore, investing in HRM practices that support digital initiatives will further amplify the benefits of technological adoption.

While the study provides valuable insights, it is important to acknowledge its limitations. One significant constraint is the small sample size, which may restrict the generalizability of the findings. Because the study focused on a small number of public sector industrial companies, the results may not reflect the experiences of all entities in Jordan's public sector. Therefore, we should interpret the insights from this research with caution, as they might not fully capture the diverse challenges and successes encountered across different sectors. Furthermore, the concentration on specific industrial sectors may overlook critical variations in experiences among other public sector entities. This limitation suggests that while the findings are relevant, future research should aim for broader inclusion across various sectors to achieve a more comprehensive understanding of digital transformation's impact within the public sector. Furthermore, the study relies on self-reported data, which may lead to biases in responses and inaccuracy in estimates. Also, there are neglected variables that are not included in the analysis, such as leadership style and organizational factors that may have a significant impact on cost reduction.

To build on the insights gained from this study, future research should consider conducting longitudinal studies that explore how digital transformation evolves over time and impacts cost efficiency. Such research would provide a more dynamic view of the transformation process, highlighting the long-term effects of digital initiatives on operational costs. By examining these trends, scholars can offer a deeper understanding of the lifecycle of digital transformation in public sector contexts. Additionally, future studies should investigate the influence of particular technologies, such as artificial intelligence (AI) and big data analytics, on operational cost management. These technologies have the potential to revolutionize how public sector companies approach cost efficiency, making it critical to understand their specific impacts and applications. By delving into these technologies, researchers can identify best practices and offer tailored recommendations for organizations aiming to enhance their operational performance through digital tools.

The findings of this study resonate with existing theoretical frameworks that link technology adoption with improved organizational efficiency. By providing empirical evidence that highlights the effectiveness of digital initiatives in driving significant cost reductions, the research reinforces the notion that strategic technology integration is essential for achieving operational excellence. This connection to theoretical frameworks not only

legitimizes the study's findings but also situates them within a broader academic discourse on digital transformation. Furthermore, the empirical evidence gathered supports theories that advocate for the transformative power of technology in public sector organizations. The study illustrates that embracing digital solutions can lead to substantial improvements in both cost management and productivity, aligning with theoretical perspectives that emphasize the strategic role of technology in enhancing organizational performance.

This research makes several unique contributions to the field of digital transformation, particularly within the context of the public sector. Firstly, it addresses existing gaps in the literature concerning the specific mechanisms through which digital transformation can lead to cost reductions. By providing fresh insights into these processes, the study enhances the understanding of how public sector organizations can effectively leverage technology to improve their operational efficiency. Moreover, the research offers practical recommendations that can guide public sector companies in their digital transformation journeys. By identifying actionable strategies for improvement, such as the establishment of robust performance evaluation systems and enhanced alignment of digital strategies with organizational objectives, the study equips practitioners with the tools necessary for successful implementation. This practical focus is essential for translating academic findings into real-world applications, thereby fostering a more significant impact on public sector performance.

In conclusion, the research underscores the significance of digital transformation for stakeholders in the public sector, particularly in industrial companies. By highlighting the critical role of technology in enhancing operational efficiency and cost-effectiveness, the study serves as a call to action for public sector organizations to invest in technology and innovation. As these companies navigate the challenges of modernization, the findings encourage them to prioritize digital initiatives as a pathway to improved performance. Ultimately, the insights gained from this research pave the way for further investments in technology and innovation within the public sector. By embracing digital transformation, organizations can enhance their operational efficiency and cost-effectiveness, ensuring they remain competitive and responsive to the evolving needs of society. This commitment to continuous improvement will not only benefit individual organizations but also contribute to the broader goals of economic development and public service excellence in Jordan.

Acknowledgments: The authors express their sincere appreciation to The University of Jordan – Aqaba Branchand Al-Balqa Applied Universityfor their valuable academic and institutional support throughout this research. Special thanks are extended to the management teams and staff of the Jordanian public joint stock industrial companies who participated in the study and provided insightful information that greatly enriched the analysis. The authors also acknowledge the constructive feedback from the reviewers and editorial team of Scientific Culture, which helped improve the quality and clarity of this paper. Finally, deep gratitude is expressed to colleagues and families for their continued encouragement and support during the completion of this research.

REFERENCES

Akeem, L. B. (2017). Effect of cost control and cost reduction techniques in organizational performance. International Business and Management, 14(3), 19-26.

Albukhitan, S. (2020). Developing digital transformation strategy for manufacturing. Procedia Computer Science, 170, 664-671.

Al-Okaily, M., Alsmadi, A. A., Alrawashdeh, N., Al-Okaily, A., Oroud, Y., & Al-Gasaymeh, A. S. (2023). The role of digital accounting transformation in the banking industry sector: An integrated model. Journal of Financial Reporting and Accounting. Advance online publication. https://doi.org/10.1108/JFRA-07-2023-0221

Brdesee, H. (2021). A divergent view of the impact of digital transformation on academic organizational and spending efficiency: A review and analytical study on a university E-service. Sustainability, 13(13), 7048.

Chen, Y., & Xu, J. (2023). Digital transformation and firm cost stickiness: Evidence from China. Finance Research Letters, 52, 103510.

Chwiłkowska-Kubala, A., Cyfert, S., Malewska, K., Mierzejewska, K., & Szumowski, W. (2023). The impact of resources on digital transformation in energy sector companies: The role of readiness for digital

transformation. Technology in Society, 74, 102315.
Dahooie, J. H., Dehshiri, S. J. H., Banaitis, A., & Binkytė-Vėlienė, A. (2020). Identifying and prioritizing cost reduction solutions in the supply chain by integrating value engineering and gray multi-criteria decision-making. Technological and Economic Development of Economy, 26(6), 1311-1338.
Datar, S. M., & Rajan, M. V. (2021). Horngren's cost accounting: A managerial emphasis (17th ed.). Pearson.
dos Santos, S. B., Capellin, F., Trentin, M., Bortoluzzi, S. C., & de Lima, E. P. (2022, July). Digital Transformation in the Public Sector: Enabling Technologies and Their Impacts. In International Joint conference on Industrial Engineering and Operations Management (pp. 101-113). Cham: Springer International Publishing.
Elia, A., Kamidelivand, M., Rogan, F., & Gallachóir, B. Ó. (2021). Impacts of innovation on renewable energy technology cost reductions. Renewable and Sustainable Energy Reviews, 138, 110488.
Escobar, F., Almeida, W. H., & Varajão, J. (2023). Digital transformation success in the public sector: A systematic literature review of cases, processes, and success factors. Information Polity, 28(1), 61-81.
Feliciano-Cestero, M. M., Ameen, N., Kotabe, M., Paul, J., & Signoret, M. (2023). Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization. Journal of Business Research, 157, 113546.
Fischer, M., Imgrund, F., Janiesch, C., & Winkelmann, A. (2020). Strategy archetypes for digital transformation: Defining meta objectives using business process management. Information & Management, 57(5), 103262.
Gonçalves, M. J. A., da Silva, A. C. F., & Ferreira, C. G. (2022, February). The future of accounting: how will digital transformation impact the sector?. In Informatics (Vol. 9, No. 1, p. 19). MDPI.
Guerra, J. M. M., Danvila-del-Valle, I., & Méndez-Suárez, M. (2023). The impact of digital transformation on talent management. Technological Forecasting and Social Change, 188, 122291.
Hansen, D. R. (2009). Cost management accounting and control. South-Western.
Khatib, O., & Alshawabkeh, K. (2022). Digital transformation and its impact on strategic supremacy mediating role of digital HRM: Evidence from Palestine. WSEAS Transactions on Business and Economics, 19, 197-221.
Kovács, G., & Kot, S. (2017). Facility layout redesign for efficiency improvement and cost reduction. Journal of Applied Mathematics and Computational Mechanics, 16(1), 63-74.
Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. International Journal of Information Management, 63, 102466.
Larsson, A., & Teigland, R. (2019). Digital transformation and public services: Societal impacts in Sweden and beyond (p. 378). Taylor & Francis.
Liere-Netheler, K., Packmohr, S., & Vogelsang, K. (2018). Drivers of digital transformation in manufacturing. In Proceedings of the 51st Hawaii International Conference on System Sciences (pp. 3814-3823). University of Osnabrück.
Llopis-Albert, C., Rubio, F., & Valero, F. (2021). Impact of digital transformation on the automotive industry. Technological Forecasting and Social Change, 162, 120343.
Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., & Mena, L. J. (2023). Role of digital transformation for achieving sustainability: Mediated role of stakeholders, key capabilities, and technology. Sustainability, 15(14), 11221.
Nazari, Z., & Musilek, P. (2023). Impact of digital transformation on the energy sector: A review. Algorithms, 16(4), 211.
Omol, E. J. (2023). Organizational digital transformation: From evolution to future trends. Digital Transformation and Society.
Otia, J. E., & Bracci, E. (2022). Digital transformation and the public sector auditing: The SAI's perspective. Financial Accountability & Management, 38(2), 252-280.
Peng, Y., & Tao, C. (2022). Can digital transformation promote enterprise performance?—From the perspective of public policy and innovation. Journal of Innovation & Knowledge, 7(3), 100198.
Sekaran, U., & Bougie, R. (2016). Research methods. for business: a skill- building approach (7th ed). John Wiley and Sons Inc, New York.
Sepasgozar, S. M., Costin, A. M., Karimi, R., Shirowzhan, S., Abbasian, E., & Li, J. (2022). BIM and digital tools for state-of-the-art construction cost management. Buildings, 12(4), 396.

Stich, V., Zeller, V., Hicking, J., & Kraut, A. (2020). Measures for a successful digital transformation of SMEs. Procedia CIRP, 93, 286-291.

Sulistya, A. Q. W., Sulistiyo, B. B., Aditya, F., Aritonang, I. D., Simangunsong, S. A., Shihab, M. R., & Ranti, B. (2019, July). A case study of Indonesian government digital transformation: Improving public service quality through E-government implementation. In 2019 5th International Conference on Science and Technology (ICST) (Vol. 1, pp. 1-6). IEEE.

Tiutiunyk, I., Drabek, J., Antoniuk, N., Navickas, V., & Rubanov, P. (2021). The impact of digital transformation on macroeconomic stability: Evidence from EU countries. Journal of International Studies, 14(3), 219-233.

Viana, A. C. A. (2021). Digital transformation in public administration: from e-Government to digital government. International Journal of digital law, 1, 29-44.

Volodina, T., & Grossi, G. (2024). Digital transformation in public sector auditing: between hope and fear. Public Management Review, 1-25.

Wang, C., & Ma, L. (2022). Digital transformation of citizens' evaluations of public service delivery: evidence from China. Global Public Policy and Governance, 2(4), 477-497.

Weking, J., Stöcker, M., Kowalkiewicz, M., Böhm, M., & Krcmar, H. (2020). Leveraging industry 4.0: A business model pattern framework. International Journal of Production Economics, 225, 107588.

Yang, C., Gu, M., & Albitar, K. (2024). Government in the digital age: Exploring the impact of digital transformation on governmental efficiency. Technological Forecasting and Social Change, 208, 123722.

Zakeri, B., & Syri, S. (2015). Electrical energy storage systems: A comparative life cycle cost analysis. Renewable and Sustainable Energy Reviews, 42, 569-596.

Zaoui, F., & Souissi, N. (2020). Roadmap for digital transformation: A literature review. Procedia Computer Science, 175, 621-628.

Zhang, M., & Peng, D. (2023). The impact of digital transformation on corporate cross-border mergers and acquisitions. Finance Research Letters, 58, 104427.