Migration Letters

Volume: 20, No: 7, pp. 380-394

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

The Effect of Digital Transformation on Organizational Performance by A Mediating Role of Digital Innovation

Sura I Al-Ayed[1], Ahmad Adnan Al-Tit[2], Areej Alashjaee[3]

Abstract

Organizations face much pressure to deal with rapid changes in technologies as well as the way of working. Digital transformation helps them keep up with these changes, but there are still many aspects that organizations need to deal with in a highly competitive environment. Therefore, there is a need for a comprehensive overview of the effect of digital transformation on the Saudi companies. To fill this gap, Research aims to examine the effect of digital transformation on organizational performance by a mediating role of digital innovation. A survey was conduct of employees working for Saudi telecommunication companies (STC, Zain, and Mobily), by using the component-based partial least squares method to analyze the 170 completed questionnaires. The results indicate that there is a relationship between digital transformation and organizational performance, mediated by digital innovation. And noted that the social and technological perspectives of digital transformation have a significant impact on digital innovation. Finally, the findings encourage large companies to take the opportunity to adopt digital transformation and digital innovation to boost their performance from all organizational perspectives.

Keywords: *Digital transformation; Digital innovation; Organizational performance; Balanced scorecard; Saudi companies.*

1. Introduction

The current rapid changes in technology have affected many aspects of our life, including the business world. These effects have encouraged companies to work differently and change their business models. Consequently, organizations seeking to survive in a highly competitive digital economy need to adopt a digital transformation approach, which entails integrating digital technologies into business processes (Bharadwaj, 2000).

At the time of digital economy, becoming digital is not merely a technical issue but also a strategic management issue (Wang et al., 2020). Digital transformation is a Modern concept used by researchers. However, the definition of digital transformation changes depending on the context in which is used. Furthermore, there is no formal definition in the academic literature of the term “digital transformation” which leads sometimes to misunderstanding the term and use it wrongly (Mahraz, M.-I., Benabbou, L., & Berrado, A. (2019).

Successful digital transformation requires organizations to be aware of the innovative technologies globally available and be more resilient in changing their business model

[1] Faculty of Business Studies, Arab Open University, Riyadh, Saudi Arabia
[2] Department of Business Administration, College of Business and Economics (CBE), Qassim University, Al-Mulida, Buraidah, Saudi Arabia
[3] STC Company, Riyadh, Saudi Arabia

when they react to these new technologies. Furthermore, they must promote a flexible culture able to accept change smoothly without opposing much resistance to the transition. Moreover, they must develop the right capabilities to put digital technology at the center of how their business operates, and they need to rethink their business process model to remain Competitive (Carcary et al., 2016). According to (Hess et al.,2016), Many businesses have failed to follow the innovative technologies' trends. An example is provided by the movie-rental company Blockbuster, which lost against Netflix due to its inability to implement a digitally based business model.

Studying the Consequence of digital transformation on organizational performance is an attractive topic, but there still is a Lack of investigation in this area, especially in Saudi Arabia. The importance of the Present review is based on Studying the effect of digital transformation and providing an appropriate model demonstrated the role of design thinking approach to boosting organizational performance in large companies that listed in Saudi Market. That will provide the companies with a clear vision of why they need to follow this approach. Hence, this study adds to the Literary production by approaching the organizational, technological, and social effects of digital transformation. Furthermore, the Mediation role of digital innovation on the Relation between digital transformation and its organizational performance is introduced. Hence, we decided to administer questionnaires to employees who work for the listed Saudi companies to measure the variables. we believe that the Discovering of the data analysis can provide insight to anyone interested in the impact of digital transformation on organizations and organizational performance.

The present paper contributes to the literature by investigating digital transformation as an independent variable that influences organizations. As mentioned above, these three elements (technologies, organizational, and social perspective) have specific effect on performance, which is assessed in the present research. Furthermore, previous researchers have studied the impact of different variables on organizational performance in specific industries or for small and medium enterprises. The Primary objective of This research is to Investigate the effect of digital transformation on organizational performance for large Saudi Businesses Registered in the stock market that have announced their annual reports. Moreover, we will analyze the relationship between digital transformation and organizational performance, where the meditating variable is digital innovation, which leads to the second research question: Does digital innovation translate digital transformation into better organizational performance?

According to McKinsey's report, transformation is hard, and digital transformation is the hardest one. To succeed in digital transformation cultural and behavioral changes are needed in an organization as well as within the processes and by empowering employees to embrace these changes (McKinsey & Company, 2018). In this study, we will determine what makes some companies succeed in their approach to applying digital transformation and how this positively reflects on their organizational performance. Then we offer recommendations following the findings of this analysis of Saudi companies from different industries. Furthermore, after studying the relationship between the independent variable digital transformation— and the dependent variable—organizational performance—, it will be possible to understand which organization had the most significant impact. Finally, we investigate these factors that positively impact the Saudi organizations, which then help provide recommendations to apply it.

The main beneficiary of this study are the organizations that intend to apply digital transformation successfully. Organizations, at present, want to be aware of what they need to change with a focus on be able to Respond quickly when they need to. Furthermore, we focus on the main reasons to apply digital transformation and what encourages companies to follow this approach. Moreover, organizations need to Sustain with changing customer Attitude and needs and enhance their way of communicating

with them. Hence, we intend to highlight this point in the paper, which will help organizations to build their road map of applying digital transformation.

In practice, this research contributes to research that tackle the companies in Saudi Arabia and listed in the stock market by assessing the effect of digital transformation on organizational performance and highlighting the crucial need to Control the digital transformation to have innovative digital Outcomes. Considerate the factors that help to apply the digital transformation approach and its impact would encourage organizations to consider it as an opportunity to Strengthen the business performance.

The Next Parts Introduce a literature review about digital transformation, organizational performance, and digital innovation. After that, we will Introduce the methodology and the results. Lastly, we will Investigate them and Underline the Key Contributions in addition to the Key limitations of the study.

2. Literature review

2.1 Digital transformation

Digital transformation and its effect on organizational performance have significantly triggered the interest of researchers from various disciplines for a long time. Some, such as Chen et al. (2016), have discussed the effect of specific technologies or the digital transformation framework in changing business (Ziyadin et al., 2019), while other works have focused on determining the effect of digital transformation on organizational performance Across all aspects. Berghaus and Back (2017) analyzed what drives companies to adopt digital transformation programs. Specifically, they examined many of the reasons that lead companies to transform, and they found that all companies align with these motivations no matter the industries they serve or the size of the company. Companies realized the obligation to be transformed to keep their position in the market and to compete with other companies by keeping up with digital changes in their industry. Haffke et al. (2017) and Schmidt, Drews, and Schirmer (2017) mentioned that there are internal and external triggers that drive companies to engage in digital transformation. Organizations realized that there has been a huge shift in the industry they serve due to digital technologies and that they need to keep up with it. DT was adopted because of the changes in customer behaviors and their expectations as well as Variations in the competitive Perspective (Berghaus & Back, 2017).

Furthermore, the objective of digital transformations, as Mocker and Fonstad (2017) claimed, relates to organizations' need to enhance existing products digitally and to bring innovation in developing products (Berghaus & Back, 2017). Other researchers determined a variety of reasons that drive firms to adopt a digital transformation approach, such as improving customer digital experience and channels to deliver digital precuts while considering changing customer behaviors. Subsequently, improvising and maintaining customer stratification is one of the crucial objectives that drive organizations (Berghaus & Back, 2017; Bilgeri et al., 2017; Isaksson and Hylving, 2017; Mocker and Fonstad, 2017).

Sebastian and his colleagues mentioned that new technologies—especially social and mobile technologies, analytics, cloud, and internet of things (IoT)—have transformed the way of doing business by changing Possibilities and opportunities and creating threats to Major old Businesses, and those that fail to adopt these technologies and a digital transformation approach are Ready to lose (Sebastian et al., 2017; Al-Ayed & Al-Tit, 2023). Osmundsen et al. (2018) tried to find answers to the question of why organizations undergo digital transformation, and they analyzed this effect on organizations. They found that digital transformation impacts organizations' performance either directly or indirectly.

Many authors aimed to define digital transformation because the term is new, and the concept related to it varies based on the context. Reis et al. (2018) categorized the definitions of digital transformation into three elements: technological, organizational, and social. They defined the technological element based on the use of new digital technologies. Specifically, the changes that are required by digital transformation in organization processes or that lead to new business models pertain to the organizational element. The social element of digital transformation concerns the way the latter impacts all Situations of human life and includes the enhancing of customer experience.

Thus, the authors defined digital transformation as the enablement of business improvements due to new technologies impacting customer experience. Specifically, the impact of digital transformation in any company ranges across three levels: customer experience, business processes and Business process model (Mahraz et al., 2019). In their attempt to understand and define digital transformation, Verhoef and et al (2021) conducted a scoping Check of the Various Areas of information systems, marketing, innovation, and strategy to identify the Stages of digital change and identified Stages of DT: digitization, digitalization, and digital transformation. Previous literature has mostly argued that the first two Stages —digitization and digitalization—are Required to reach the goal, which is digital transformation (Loebbecke & Picot, 2015; Hartl & Hess, 2017; Matt, Hess, & Benlian, 2015; Parviainen, Tihinen, Kääriäinen, & Teppola, 2017). As for that, the Saudi Telecom Company has adapted the digital transformation approach by going through these phases, and they announced their strategy this year 2020. As described above, researchers mainly define digital transformation according to three elements: technological, organizational, and social perspectives (J. Reis et al., 2018). In our subsequent discussion, we focus on these elements of digital transformation for listed companies in the Saudi Arabia market, as it offers an excellent example of their complete transformation, and it is the focus of our paper.

Mahraz and his colleagues claimed that there are trendy technologies that influenced the technology items of digital transformation and shaped it. These technologies are big data, cloud computing, IoT, and blockchain. Their applications have affected different industries in the market as well as the whole departments of firms. However, besides the benefits of using these digital technologies, companies also must face challenges, such as new skills needed for using it among managers and employees (Mahraz et al., 2019). According to White (2019), to reach digital transformation success, companies should consider not only implementing these technologies but also see the power of fitting them into the company strategy and how they can work to make a significant business impact. The culture of a company is also influenced by technology. Notably, the embracing of digital transformation with aid in modifying the culture to make it easy to comprehend. This is because training offered through digital means yields expected results compared to manual training (Wang et al, 2020).

Saudi Arabia has taken steps to ensure the faster development of digital transformation, like transformation towards the knowledge economy and e-commerce. These strategies are aimed at improving the living standards of the citizens and to work on the economic balance of Saudi Arabia. It has worked towards awareness of technology to achieve its goals. To achieve these goals, the National Committee for Digital Transformation was established to legislation and policies about a government technology upgrade. The government also worked on putting strategies and activities important for reaching them. National Digital Transformation Unit is among the government programs put in place to monitor the vision of Saudi of Digital transformation is achieved by 2030. This program works towards building a digital economy and digital home in a specific way to boost the creation of the digital economy for the rise of industries. It is also aimed at the improvement of Saudi organization competitiveness in the world market. It will provide jobs, offer better services to customers and shareholders not to forget the employees, thus

increasing innovation by bringing in investors and partners from all over the world (Vision 2030).

2.2 Organizational performance

The performance of an organization relies on the outputs compared to the inputs. Managers strive to enhance the performances of their organizations in diverse ways. For example, hiring the right employees for the job, having adequate financial muscle, and a viable market for the goods and services. Studies asserted by business gurus categorize organizational performance into three cohorts. They include financial performance, product-market performances and shareholders return. Additionally, digital transformation will propel the firm to greater success. With technology, better decisions are made, and time is saved. For instance, a reference to files will be easier and quicker, also communication will be enhanced in the firm. Notably, peer counsel may be sought by the employees without necessarily moving about in the firm (Teichert, 2019). Managers have implemented these measures to ensure the success of their firms. It is imperative to embrace digital transformation as it can be used to make a sales forecast. Sales are important in a business, with salesforce technology, managers can adjust in their reports to yield copious gains.

A firm's financial muscle is essential to run its operational endeavours. Firms with a comprehensive financial plan will realize augmented spoils. The financial plan of firms is executed by the financial managers, also, with digital transformation even more objective decisions will be made. Notably, the financial department is indispensable in every firm. This is because, without proper management of the finances, the firm will not initiate its operational undertakings. Moreover, to have impeccable financial performances, firms should take in employees with exquisite financial management record. Furthermore, managers of integrity should be put in place since those lacking integrity will plunder the firm`s resources. Digital transformation is key in a firm. Digital transformation is the Transfer from the use of manual approaches to digital approaches in a firm. Some firms have perceived digital transformation as a strategy. Consequently, firms can link their business culture with their objectives. This is made possible with the use of technology. For instance, the firm can evaluate the risks of portfolios and choose the most appropriate investment.

Digital transformation has catapulted institutions to success. With the balanced scorecard approach, the effects of digital transformation on an organization's performance can be evaluated. For instance, digital transformation makes it possible to monitor the undertakings of employees. Furthermore, the decisions made by the employees can be observed and its consequence foretold. Decisions that are not in line with the firm's objectives can be retracted. Also, the managers can use digital transformation to educate the staff to make informed decisions. For example, when managers retract the uninformed decisions, they can teach the staff on what the best decision would be. When a firm makes objective decisions, the outcomes will enhance its production thus having an improved performance. Accountability is a virtue that is incorporated by firms. The basis of initiating this virtue is to foster responsibility amongst the employees. Studies have revealed that responsible employees reduce the errors made while executing their tasks. Correspondingly, firms have choreographed approaches to stem irresponsibility and negligence in a business setting. These entities have a business structure in which a task is not completed by a single individual. Such measures ensure that when one employee fails to submit the unfinished task to the next employee there will be chaos. Consequently, it will be easier to identify the underperforming employee who will be punished profoundly as per the articles of association. Concisely, digital transformation has aided in identifying employees who derail the firm's efforts to achieve its objectives.

2.3 Digital innovation

The world of digital innovation is a revolution, changes over time. Digital innovation Mentions to the application of digital technology to figure out a solution for Present business Difficulties. Businesses usually prefer new techniques to solve old challenges. Thus, it is an important essential in achieving business objectives and goals. It gives rise to the potential of produce and service innovation which is usually a challenge in business organizations. According to Hauser et al. (2006), one of the crucial causes on the organizations is innovation beside that it is a wide topic many specialists cover it from different perspectives Like product and service development and organizational behavior (Hauser, Tellis, & Griffin, 2006). Therefore, an organization should be in apposition to manage digital tools and service innovation. They should be able to appreciate digital transformation through promoting innovation, agility, and vision of the company for it to experience true digital success. However, some organizations regard innovation as being expensive and with no functionality which leads to their fallback. Therefore, the organization should see innovation as part of a business profit input. Innovation should never contradict brand positioning thus innovation office should deal with consumer needs, business needs and, operation of the company (Ferreira, Fernandes, & Ferreira, 2019)

3. Research model and hypotheses

As discussed above, Multiple researchers have Investigated digital transformation elements from different Views as demonstrated in the literature review section. Moreover, some of them analyzed the effect of it on organizational performance, as did Chen and his colleagues in their study of the effect on the small and medium enterprises (Chen et al., 2016). To achieve the objectives of the study, a few hypotheses were presumed. These were formed based on previous and current studies on the effect of digital transformation on organizational performance.

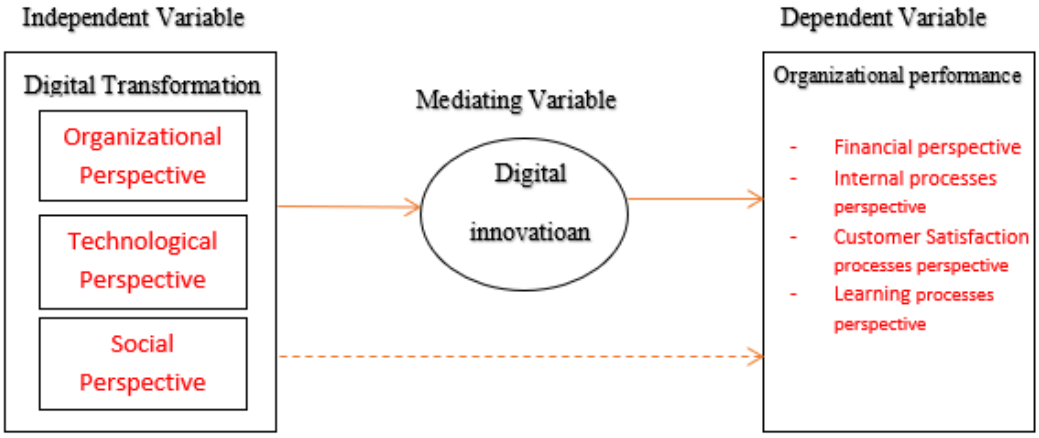

Figure 1 The research model illustration

Before discussing our hypothesis, we must understand the relations between the variables that we will analyze. The research model in Figure 1 in a simplified Design. The key objective is to Determine the organizational performance that have affected by digital transformation as direct effect or indirect by digital innovation.

In reference to a literature review (Mubarak et al., 2019; Chen et al., 2016; Wang et al., 2020), it is Anticipated that digital transformation will positively effect on organizational performance. In some organizations, they measured digital transformation by using digital technology to provide digital experience to customers. Others, based on digitizing operational Procedure and the change reflected in Business process model, are influenced

by new technologies (Kwon & Park, 2017). Adopting digital technologies is not an easy process, especially for large companies due to the resources they need to invest in to have the right capabilities to run these technologies. For example, if the company decided to have a digital portal for customer services, they need to hire experts to build this portal and train the employee to use it.

In general, the finding highlights that digital strength dimensions must be Powered into digital innovation that could, in sequence, enhance the organization's performance. Khin and Ho (2020) have found that using digital technologies leads to benefit from digital innovation, which improves the performance of firms that adopt them. Considering of the literature support, this research Argues that using digital technologies boost firms' organizational performance. We thus hypothesize:

H1: There is a direct relationship between using digital technologies perspective and digital innovation.

H2: There is a direct relationship between using digital organizational perspective and digital innovation.

H3: There is a direct relationship between using digital social perspective and digital innovation.

H4: There is a direct relationship between using digital innovation and financial perspective.

H5: There is a direct relationship between using digital innovation and internal processes perspective.

H6: There is a direct relationship between using digital innovation and customer satisfaction perspective.

H7: There is a direct relationship between using digital innovation and learning processes perspective.

The literature affirms that innovation has a positive impact on organizational performance (Valmohammadi, 2017; Choi et al., 2013; Ussahawanitchakit, 2012; Hortinha, Lages & Lages, 2011). Even so, some research highlighted its negative impact on the performance of the organization (Damanpour and Evan, 1990; Laforet, 2011). Khin and Ho (2020) Examined the intermediate effect of innovation between digital transformation and performance, but only in the digital environment. They argued that digital innovation has a significant effect as a mediating variable between digital orientation and digital capability and better organizational performance. Based on that, we will study digital innovation as a mediating role by translating digital transformation into better performance from all the aspects. Hence, we hypothesize as follows:

H8a: There is an indirect relationship between using digital technologies perspective and financial perspective is mediated by digital innovation.

H8b: There is an indirect relationship between using digital technologies perspective and internal processes perspective is mediated by digital innovation.

H8c: There is an indirect relationship between using digital technologies perspective and customer satisfaction perspective is mediated by digital innovation.

H8d: There is an indirect relationship between using digital technologies perspective and learning processes perspective is mediated by digital innovation.

H9a: There is an indirect relationship between using digital organizational perspective and the financial perspective is mediated by digital innovation.

H9b: There is an indirect relationship between using digital organizational perspective and the internal processes perspective is mediated by digital innovation.

H9c: There is an indirect relationship between using digital organizational perspective and the customer satisfaction perspective is mediated by digital innovation.

H9d: There is an indirect relationship between using digital organizational perspective and the learning processes perspective is mediated by digital innovation.

H10a: There is an indirect relationship between using digital social perspective and the financial perspective is mediated by digital innovation.

H10b: There is an indirect relationship between using digital social perspective and the internal processes perspective is mediated by digital innovation.

H10c: There is an indirect relationship between using digital social perspective and the customer satisfaction perspective is mediated by digital innovation.

H10d: There is an indirect relationship between using digital social perspective and the learning processes perspective is mediated by digital innovation.

4. Methodology

4.1. Data collection

In this study focuses on analyzed the causal relationship between the independent variables that are influential and the dependent variables that are affected. We used a quantitative approach to analyze this research data by using a static method, the results of the analyzed data were used to answer the hypotheses of this research study. For that, we designed an online questionnaire that targeted employees working for the listed companies in the Saudi stock market. We reached the respondents from students in Saudi Electronic University SEU that are currently working for large Saudi telecommunication companies (STC, Zain, and Mobily), personal contacts, members on LinkedIn, and members of professional's social media groups. The questionnaire instrument was used because researchers agreed it is an essential instrument, they use it in their study research (Vehovar & Lozar Manfreda, 2008), besides that it is a faster way to collect data. This data will be analyzed by using SPSS for descriptive data analysis and for testing the research model and the hypothesis that we discussed. In the second chapter we will use PLS-SEM.

For collecting the responds, the Surveyhero online© platform was used. One hundred and seventy people completed the survey, and thirty of the respondents didn't finish the survey. The final sample was two hundred respondents, 57.44% were female and 42.56% male. Forty-one percent of them were between 20 and 30 years old, 50.77% between 31 and 40 years old, 5.13% between 41 and 50 years old, and the remaining 3.08% older than 50.

4.2 Instrument

The indicators used in this questionnaire for measuring the variables were in accordance with previous literature, and the reason for selecting these indicators is that the researchers have tested and confirmed it as well as their relevance to this research model. Digital transformation variables were inspired by (Reis et al., 2018; Center for Creative Leadership, 2018), digital innovation indicators (Khin and Ho 2020) and for balanced scorecard dimensions were inspired by (Dan,2017). All items were measured on scales varying from (strongly agree) to (strongly disagree). As shown in Table 1, the statement in this research questionnaire was arranged as follows:

Table 1 Measurement items

Variable	Dimension	Indicators	References
Digital transformation	Organizational Perspective	- If the firm has Executed many digital initiatives that enhance their products and services. - The firm has a manifest workflow to utilize digital to help the firm release its business. - inspirational vision of how digital can establish a novel future with common value of the organization.	(Center for Creative Leadership, 2018)
	Technological Perspective	- The organization's technology platforms are simple and easy to use and have enhanced employee involvement. - The organization's units are well connected to each other via digital	(Center for Creative Leadership, 2018)
	Social perspective	- The leaders in the firm behave as role models by expediting the Transmutation of digital-centric institutions. - The organization uses digital to improve the efficiency of employees and expand its network of collaborators. - The organization has the needed expertise, proficiency, and skill staff to utilize digital successfully. - Digital technology fundamentally changes the firm's relationship with its customers.	(Center for Creative Leadership, 2018)
Digital innovation		- The quality of the firm's digital resolutions is outstanding in comparison with its competitors'. - The digital solutions of the firm are Diverse from its competitors in the context of production platform. - Some of the firm's digital resolutions are novel to the market from the moment that entry.	(Khin and Ho, 2020)
Organizational performance	Financial perspective	- The firm uses Return on Investment (ROI) to measure financial movements. - The firm uses Working Capital per Day to measure the financial movements. - The firm uses Cash Flow on Investment to measure financial movements. - The firm use Growth Rate in Tangible Assets to measure the financial movements	(Dan,2017)
	Internal processes perspective	- Unit Cost is important for the firm to assess the productiveness of the business operations. - Cycle time is important for the firm to assess the productiveness of the business operations. - Distribution Reach is important for the firm to assess the productiveness of the business operations. - Ratio of Number of Skilled Employees to Total Employees is important for the firm to assess the productiveness of the business operations.	(Dan,2017)
	Customer satisfaction perspective	- On Time Delivery is an important factor for the firm to measure customer Satisfaction. - Terms of Quality is an important factor for the firm to measure customer Satisfaction. - Number of complaints from customers is an important factor for the firm to measure customer Satisfaction. - Sales to new customers is an important factor for the firm.	(Dan,2017)
	Learning perspective	- The firm Communicate its strategy in addition to the advantages anticipated by innovation ventures, to every person in the firm. - The firm is good at generating and implementing new ideas to improve. - The firm has a framework to manage innovation projects. - The firm encourages the employees to become more innovative.	(Center for Creative Leadership, 2018; Dan, 2017)

5. Results and Discussion

In this paper, concentrate on forecaster of organizational performance, the preferred method used here is Partial Least Squares PLS due to the mediating variable presented in this study model.

5.1. Construct validity

The data was collected from 170 questionnaires using SmartPLS software to validate the hypotheses. confirmatory factor analyses (CFA) were initial used to compute the validity of construct for the 8 dimensions of the search model, which are: digital technological, digital organizational, digital social, digital innovation, finical perspective, internal process perspective, customer satisfaction perspective and learning perspective (Table 2).

Table 2 CFA of Factors

Factors	**Items**	**Mean**	**Standard Deviation**	**Loading**	**Composite Reliability**	**Average Variance Extracted (AVE)**
Digital innovation	DI1	3.81	1.266	0.876	0.914	0.779
	DI2	3.67	1.162	0.904		
	DI4	3.45	1.260	0.867		
Organizational Perspective	DTO2	4.16	0.966	0.837	0.919	0.792
	DTO3	3.89	1.127	0.917		
	DTO4	3.85	1.222	0.913		
Social perspective	DTS1	4.00	1.085	0.703	0.888	0.666
	DTS2	3.97	1.132	0.859		
	DTS3	3.92	1.117	0.85		
	DTS4	3.94	1.096	0.843		
Technological Perspective	DTT1	4.05	1.073	0.918	0.914	0.841
	DTT2	3.91	1.154	0.916		
Financial perspective	OPC1	4.38	0.920	0.892	0.915	0.73
	OPC2	4.32	0.949	0.87		
	OPC3	4.09	1.022	0.802		
	OPC4	4.09	0.981	0.852		
Learning perspective	OPF1	3.77	1.106	0.783	0.885	0.658
	OPF2	3.55	1.018	0.836		
	OPF3	3.68	1.065	0.822		
	OPF4	3.74	1.093	0.803		
Internal processes perspective	OPI1	4.14	0.978	0.799	0.903	0.699
	OPI2	3.93	0.980	0.84		
	OPI3	3.90	1.050	0.854		
	OPI4	3.84	1.072	0.85		
Customer satisfaction perspective	OPL1	3.99	1.038	0.88	0.944	0.809
	OPL2	3.88	1.091	0.914		
	OPL3	3.85	1.106	0.921		
	OPL4	3.94	1.078	0.881		

In this model we use the loading criteria that measure ($\lambda < 0.7$), for that the items did not load sufficiently ($\lambda < 0.7$) were delated (Al-Tit, 2020). One item out of four for digital innovation was deleted (DI3), two out of four for digital technological were deleted (DTO1, DTT3) and one out of four for digital organizational was deleted (DTO1).

In the PLS method we need verified is the veritable discriminant validity. It presents if each one of constructs in this model is unusual and distinct from the others. The value of shared variance between a construct and other constructs had to be less than the average variance. In table 3 below shows this case for all eight constructs.

Table 3 Discriminant validity of constructs.

	Customer satisfaction perspective	Digital innovation	Financial perspective	Internal processes perspective	Learning perspective	Organizational Perspective	Social perspective	Technological Perspective
Customer satisfaction perspective	0.899							
Digital innovation	0.716	0.883						
Financial perspective	0.486	0.559	0.854					
Internal processes	0.535	0.546	0.622	0.836				

perspective								
Learning perspective	0.509	0.438	0.413	0.529	0.811			
Organizational Perspective	0.653	0.692	0.56	0.579	0.435	0.89		
Social perspective	0.685	0.754	0.594	0.566	0.402	0.757	0.816	
Technological Perspective	0.647	0.724	0.507	0.482	0.387	0.695	0.717	0.917

The hypotheses test of this research by the significance value of the path coefficients (Beta) estimated by PLS. The variables in the second model explain a significant amount of variance in organizational performance. Figure 2

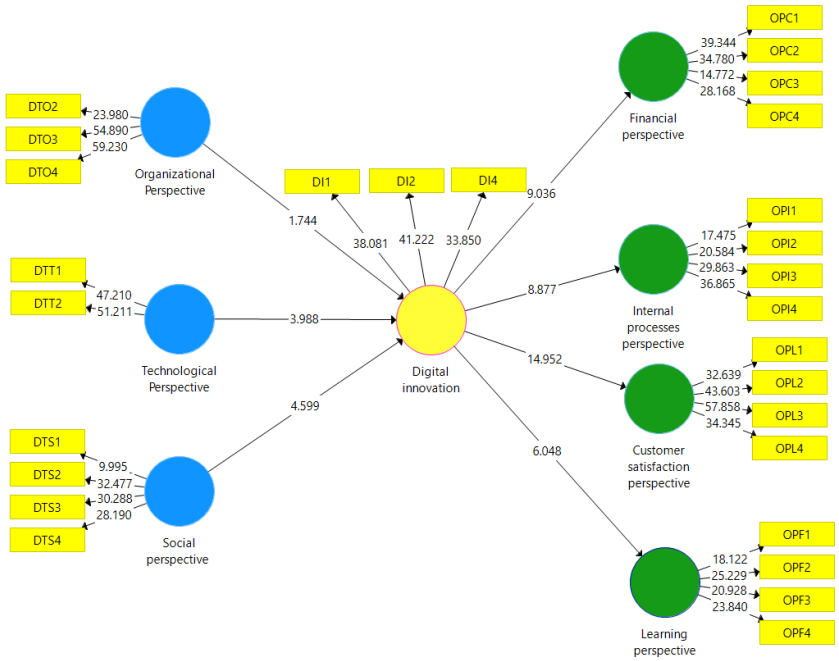

Figure 2 Test of the research model (only significant paths are represented).

Furthermore, the table 4 and figure 2 shows the result of hypothesis testing.

Table 4 summary of hypothesis testing.

Direct Hypothesis	Indirect Hypothesis	Hypothesis testing	Beta	T Statistics (|O/STDEV)	P Values	Result
H1		Organizational Perspective -> Digital innovation	0.169	1.744	0.082	Rejected
H2		Technological Perspective -> Digital innovation	0.325	3.988	0	Accepted
H3		Social perspective -> Digital innovation	0.393	4.599	0	Accepted
H4		Digital innovation -> Financial perspective	0.559	9.036	0	Accepted
H5		Digital innovation -> Internal processes perspective	0.546	8.877	0	Accepted
H6		Digital innovation -> Customer satisfaction perspective	0.716	14.952	0	Accepted
H7		Digital innovation -> Learning perspective	0.438	6.048	0	Accepted
	H8a	Organizational Perspective -> Financial perspective	0.094	1.687	0.092	Rejected
	H8b	Organizational Perspective -> Internal processes perspective	0.092	1.615	0.107	Rejected
	H8c	Organizational Perspective -> Customer satisfaction perspective	0.121	1.674	0.095	Rejected
	H8d	Organizational Perspective -> Learning perspective	0.074	1.559	0.12	Rejected
	H9a	Technological Perspective -> Financial perspective	0.182	3.834	0	Accepted
	H9b	Technological Perspective -> Internal processes perspective	0.178	3.7	0	Accepted
	H9c	Technological Perspective -> Customer satisfaction	0.233	4.098	0	Accepted

	perspective				
H9d	Technological Perspective -> Learning perspective	0.142	3.188	0.002	Accepted
H10a	Social perspective -> Financial perspective	0.22	3.949	0	Accepted
H10b	Social perspective -> Internal processes perspective	0.215	4.095	0	Accepted
H10c	Social perspective -> Customer satisfaction perspective	0.282	4.401	0	Accepted
H10d	Social perspective -> Learning perspective	0.172	3.978	0	Accepted

$p < 0.05$

The results of hypotheses testing, as shown in Table 4, indicated that technological perspective and social perspective significantly predicted digital innovation (ß 0.325, ß 0.3893, P < 0.05), which supports H2-3, while H1 is rejected. The effect of digital innovation on financial perspective was also supported (ß 0.559, P < 0.05). Similarly, Internal processes perspective (ß 0.546, P < 0.05), customer satisfaction perspective (ß 0.716, P < 0.05), and learning perspective (ß 0.438, P < 0.05). These findings confirmed that H4–H7 were accepted. Moreover, the results indicate that technological perspective significantly predicted financial perspective (ß-indirect 0.182, P < 0.05), internal processes perspective (ß-indirect 0.178, P < 0.05), customer satisfaction perspective (ß-indirect 0.233, P < 0.05), and learning perspective (ß-indirect 0.142, P < 0.05), which assured that H9a-9d were supported. Moreover, the results indicate that social perspective significantly predicted financial perspective (ß-indirect 0.22, P < 0.05), internal processes perspective (ß-indirect 0.215, P < 0.05), customer satisfaction perspective (ß-indirect 0.282, P < 0.05), and learning perspective (ß-indirect 0.172, P < 0.05), which assured that H10a-10d were supported. On the other hand, that that H8a-8d were not supported.

This study answered two main questions that are discussed in the introduction part, the first question is about definitive the impact of digital transformation on the organizational performance by studying the relationship between the independent variable and the dependent variable, once with the direct effect of digital innovation and the second without it. As we studied the sub variables of digital transformation which are the technological perspective, social perspective, and organizational perspective. We found that technological perspective has a positive impact on digital innovation achievement. This result is in harmony with the previous research (Khin & Ho, 2020). Also, results display a significant link between digital social and digital innovation. Furthermore, the mediating role of digital innovation connects the digital transformation indirect impact on organizational performance. We found that there is a positive indirect impact of digital technology on organizational performance and there is an indirect impact of digital social on organizational performance. Despite the fact of the positive relationship predicted by some research (Charles, 2014; Hinings et al.,2018; Aly, 2022), our results show that digital organizational has no huge impact on organizational performance.

6. Conclusion and Implication

This study examined the effect of digital transformation on organizational performance in the largest Saudi companies, with particular focus on the mediating role of digital innovation. The research was executed to elicit the response of the employees who working for largest companies as they perceive the subject matter on their company. We concluded that digital transformation and digital innovation go hand in hand and independently predict organizational performance. Finally, this research contributes to the new way of working that campiness applies it by assessing the linkages between digital technology, digital organizational, digital social, and perceived organizational performance that mediating by digital innovation based on Saudi Arabia using a survey-based research methodology. This research developed and examined a research model connecting digital transformation dimensions with organizational performance. We found positive and significant performance results of digital transformation. This research thus fills a gap between theory and practice for applying digital transformation to large companies.

The findings of this study will be contributed and have relevance from a managerial perspective across three aspects: using new technologies, digital leaders, and consumer behaviors. Accordingly, we tested our hypothesis that is related to technology perspective and the result shows there is a positive impact of digital technology on the performance of the firm. Also, digital social has a positive impact on digital innovation which leads to boost organizational performance. And that gives us an indicator if the organization cares about investing in the digital leader which influences the organization with a magnificent impact.

This study on digital transformation has determined the role of top management in leading the transformation as the first paragraph of social variable has a mean of 4.0 which means that most of the responses are closed to somewhat agree and it has standard deviation of 1.08 which means that the data is closed to its center. On the other hand, this research has tested the relationship between digital transformation and organizational performance as direct and indirect mediating by digital innovation. This study contributed to the scientific field by examining the relationships with all sub-variables.

The major limitation of this study was the number of responds answering the research questionnaire. This study focuses only on digital transformation's general effect without considering what type of technology or digital innovation initiative. This limitation allows future researchers of digital transformation to go deeper into one dimension of digital transformation.

Funding

This research has been supported by the Research Fund at the Arab Open University, Saudi Arabia. Research Group No. AOURG- 2023-003.

Acknowledgments

Researchers would like to thank the Arab Open University, Saudi Arabia. We also thank the Deanship of Scientific Research, Qassim University, Saudi Arabia.

References

Al-Ayed, Sura & Al-Tit, Ahmad (2023). The effect of supply chain risk management on supply chain resilience: The intervening part of Internet-of-Things. Uncertain Supply Chain Management, 11: https://doi.org/10.5267/j.uscm.2022.10.009

Al-Tit, Ahmad (2020). The Impact of Drivers' Personality Traits on Their Risky Driving Behaviors. Journal of Human Behavior in the Social Environment, 30(1):1-12 https://doi.org/10.1080/10911359.2019.1700866

Aly, H. (2022). Digital transformation, development and productivity in developing countries: is artificial intelligence a curse or a blessing?, Review of Economics and Political Science, 7(4): 238-256. https://doi.org/10.1108/REPS-11-2019-0145

Berghaus, S., & Back, A. (2017). Disentangling the Fuzzy Front End of Digital Transformation: Activities and Approaches. In Thirty Eighth International Conference on Information Systems ICIS, Dec 10th, South Korea, Proceedings, 4. (pp. 1–17).

Bharadwaj, A.S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation, MIS Quarterly, 24(1): 169-196. https://doi.org/10.2307/3250983

Bilgeri, D., Wortmann, F., & Fleisch, E. (2017). How Digital Transformation Affects Large Manufacturing Companies' Organization. In Thirty Eighth International Conference on Information Systems ICIS, Dec 10th, South Korea, Proceedings, 4. (pp. 1–9).

Carcary, M., Doherty, E., Conway, G. (2016). A dynamic capability approach to digital transformation–a focus on key foundational themes. In: 10th European Conference on Information Systems Management. Academic Conferences and publishing limited, pp. 20– 28.

Center for Creative Leadership. (2018). Digital transformation readiness survey summary. https://www.ccl.org/wp-content/uploads/2018/04/Digital-Transformation-SurveyReport.pdf

Charles, A.T. (2014). The Impact of Technological Innovation on Organizational Performance. Industrial Engineering Letters, 4(3), 97-101.

Chen, Y., Jaw, Y., & Wu, B (2016). Effect of digital transformation on organisational performance of SMEs: Evidence from the Taiwanese textile industry's web portal. Internet Research, 26(1), 186–212. http://dx.doi.org/10.1108/IntR-12-2013-0265

Dan, Anish Kumar, (2017). An Empirical Study on Balanced Scorecard as a Measurement and Management Tool for Corporate Performance. The IUP Journal of Business Strategy, XIV (4): 7-33. https://ssrn.com/abstract=3219662

Ferreira, J., Fernandes, C., & Ferreira, F. (2019). To be or not to be digital, that is the question: Firm innovation and performance. Journal of Business Research, 101, 583-590. http://dx.doi.org/10.1016/j.jbusres.2018.11.013

Haffke, I., Kalgovas, B., & Benlian, A. (2017). The Transformative Role of Bimodal IT in an Era of Digital Business. In 50th Hawaii International Conference on System Sciences, Honolulu, Hawaii, pp.:5460–5469. http://dx.doi.org/10.24251/HICSS.2017.660

Hartl, E., & Hess, T. (2017). The Role of Cultural Values for Digital Transformation: Insights from a Delphi Study. In Twenty-third Americas Conference on Information Systems AMCIS, Cultural Values in Digital Transformation, Boston, Proceedings pp. 1–10.

Hess, T; Matt, C; Benlian, A; Wiesböck, F (2016). Options for Formulating a Digital Transformation Strategy. MIS Quarterly Executive, 15/2(131), pp. 123-139. http://dx.doi.org/10.7892/boris.105447

Hinings, C. & Gegenhuber, Thomas & Greenwood, Royston. (2018). Digital innovation and transformation: An institutional perspective. Information and Organization. 28(1):52-61. http://dx.doi.org/10.1016/j.infoandorg.2018.02.004

Hortinha, P., Lages, C., & Lages, L. F. (2011). The Trade-off between Customer and Technology Orientations: Impact on Innovation Capabilities and Export Performance. Journal of International Marketing, 19(3), 36-58. https://doi.org/10.1509/jimk.19.3.36

Isaksson, V., & Hylving, L. (2017). The Effect of Anarchistic Actions in Digital Product Innovation Networks: The Case of "Over the Air" Software Updates. In 50th Hawaii International Conference on System Sciences, pp: 5763–5772. http://hdl.handle.net/10125/41858

Khin, S. and Ho, T.C. (2020). Digital technology, digital capability and organizational performance: A mediating role of digital innovation, International Journal of Innovation Science, 11(2): 177-195. https://doi.org/10.1108/IJIS-08-2018-0083

Kwon, E. H., & Park, M. J. (2017). Critical Factors on Firm's Digital Transformation Capacity: Empirical Evidence from Korea. International Journal of Applied Engineering Research, 12(22), 12585-12596.

Loebbecke, C., & Picot, A. (2015). Reflections on societal and business model transformation arising from digitization and big data analytics: A research agenda. The Journal of Strategic Information Systems, 24(3), 149–157. http://dx.doi.org/10.1016/j.jsis.2015.08.002

Mahraz, M. I., Benabbou, L., & Berrado, A. (2019). A Systematic literature review of Digital Transformation. Proceedings of the International Conference on Industrial Engineering and Operations Management Toronto, Canada, October 23-25.

Matt, C., Hess, T. & Benlian, A. Digital Transformation Strategies. Bus Inf Syst Eng 57, 339–343 (2015). https://doi.org/10.1007/s12599-015-0401-5

McKinsey & Company. (2018, October 29). Unlocking success in digital transformations. https://www.mckinsey.com/business-functions/organization/our-insights/unlocking-success-in-digital-transformations#

Mocker, M., & Fonstad, N.O. (2017). Driving Digitization at Audi. International Conference on Interaction Sciences. pp.:1– 15.

Mubarak, M. F., Shaikh, F. A., Mubarik, M., Samo, K. A., & Mastoi, S. (2019). The Impact of Digital Transformation on Business Performance: A Study of Pakistani SMEs. Engineering, Technology & Applied Science Research, 9(6): 5056–5061. https://doi.org/10.48084/etasr.3201

Osmundsen, Karen; Iden, Jon; and Bygstad, Bendik (2018). Digital Transformation: Drivers, Success Factors, and Implications. MCIS 2018 Proceedings. 37. https://aisel.aisnet.org/mcis2018/37

Parviainen, P. ., Tihinen, M. ., Kääriäinen, J. ., & Teppola, S. . (2017). Tackling the digitalization challenge: how to benefit from digitalization in practice. International Journal of Information Systems and Project Management, 5(1), 63–77. https://doi.org/10.12821/ijispm050104

Reis, J., Amorim, M., Melão, N., Matos, P. (2018). Digital Transformation: A Literature Review and Guidelines for Future Research. In: Rocha, Á., Adeli, H., Reis, L.P., Costanzo, S. (eds) Trends and Advances in Information Systems and Technologies. WorldCIST'18 2018. Advances in Intelligent Systems and Computing, vol 745. Springer, Cham. https://doi.org/10.1007/978-3-319-77703-0_41

Schmidt, J., Drews, P., & Schirmer, I. (2017). Digitalization of the Banking Industry: A Multiple Stakeholder Analysis on Strategic Alignment. In Twenty-third Americas Conference on Information Systems AMCIS, Boston. Proceedings, pp.: 1–10.

Sebastian, Ina M.; Ross, Jeanne W.; Beath, Cynthia; Mocker, Martin; Moloney, Kate G.; and Fonstad, Nils O. (2017). How Big Old Companies Navigate Digital Transformation," MIS Quarterly Executive: 16(3): 197–213. https://aisel.aisnet.org/misqe/vol16/iss3/6

Teichert, R. (2019). Digital Transformation Maturity: A Systematic Review of Literature. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 67(6): 1673-1687. http://dx.doi.org/10.11118/actaun201967061673

Valmohammadi, C. (2017). Customer relationship management: Innovation and performance, International Journal of Innovation Science, 9(4): 374-395. https://doi.org/10.1108/IJIS-02-2017-0011

Vehovar, V., & Lozar, Manfreda, K. (2008). Overview: Online surveys. In n. Fielding; R. M. Lee, G. Blank, The SAGE handbook of online research methods (pp. 177–194). London: SAGE.

Verhoef, P. C. et. Al. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research. Journal of Business Research, 122: 889-901. https://doi.org/10.1016/j.jbusres.2019.09.022

Wang, H., Feng, J., Zhang, H. and Li, X. (2020). The effect of digital transformation strategy on performance: The moderating role of cognitive conflict, International Journal of Conflict Management, 31(3): 441-462. https://doi.org/10.1108/IJCMA-09-2019-0166

Wang, H., Feng, J., Zhang, H. and Li, X. (2020). The effect of digital transformation strategy on performance: The moderating role of cognitive conflict, International Journal of Conflict Management, 31(3): 441-462. https://doi.org/10.1108/IJCMA-09-2019-0166