

The Impact of Digital Transformation on Strategic Performance: The Mediating Role of Innovation at Jordanian Private Universities

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Abstract

This paper aimed to identify the impact of digital transformation on strategic performance within a turbulent and highly competitive external, especially with the fluctuations due to the technological revolution growing day by day. The researchers also addressed innovation as an intermediate variable in the relationship between digital transformation and strategic performance. The study community consisted of (492 in high and middle management) at (18) Jordanian private universities, the study was based on a quantitative approach using a proportional stratified sample, where a questionnaire consisting of (69) items was developed using the five-item Likert scale to study the three variables. The independent variable is DT with its dimensions (Digital Strategy, Digital Culture, digital leadership, digital capabilities, digital infrastructure), while SP represented the dependent variable with its dimensions (financial perspective, customer perspective, internal operations perspective, growth and learning perspective, sustainable environmental perspective), while INN acted as an intermediate variable. The data was analyzed using the software Smart PLS4 Program structural equation modelling (SmartPLS4). The study found that although digital transformation has a good effect on innovation, innovation mediates the relationship between digital transformation and strategic performance.

Keywords: Digital Transformation (DT), Strategic Performance (SP), Innovation (INN), Digital Strategy (DTS), Digital Culture (DTC), BSC, SmartPLS4, Jordanian Private Universities.

Introduction

The accelerated technological development witnessed by the environment of business organizations over the past years and its repercussions on the emergence of the digital economy and the increasing trend towards digital transformation in order to keep pace with developments in the global business environment, universities and other organizations that seek continuous development and are affected by what is happening at the technological level, being one of the technology incubating institutions constantly seeking to reach

innovative business models in order to provide distinguished services to their customers and in an effort to include a new customer segment.

Notwithstanding, digital transformation is introducing new ways of thinking and culture into an organization to implement the latest digital technology developments. With the goal of creating more added value for customers, we innovate information products and services, improve operational processes, efficiently utilize resources, and improve employees' digital knowledge levels.

The strategic performance is one of the most important pillars and metrics used in business organizations, which aims to measure the level of achievement of the goals that were planned in the strategic plan, and this is consistent with the existence of a large number of opportunities provided by the external environment, where business organizations must prepare in advance for these opportunities to exploit them to the fullest and in a manner that suits their physical, human and financial potentials, digital transformation can contribute to seizing opportunities and mitigating the risks associated with it, especially with the acceleration of technological innovation and business models to achieve the goals on range By meeting customer requirements and thus increasing the market share of the organization, which leads to survival and continuation in the market.

There is no doubt that innovation at the managerial level plays an important and vital role in the digital transformation process, as it represents the process of implementing new ideas, strategies and methods to develop new products and services, which creates value and thus business development, as some companies adopt innovation for the sake of real innovation, which represents the spark of creativity that maintains the company's progress and adds value to key stakeholders.

Hence digital transformation in universities has become an urgent necessity because of its great importance in increasing efficiency and simplifying procedures, which contributes to providing more innovative services, which in turn helps universities retain their existing customers in addition to attracting new customers, and this affects increasing the market share, which reflects on the strategic performance of universities in a positive way through achieving their goals, which enhances their survival and continuity in the business market.

The problem of the study is strategic performance. achieving a better performance level is one of the most prominent responsibilities assigned to organizations, which is the goal that represents the cornerstone of academic institutions (universities). strategic performance is a measure to determine the merit and excellence of universities in most of their operations, as they seek to improve their performance through commitment to keep pace with the steady developments in the business environment in an effort to achieve long-term goals and invest their resources in the most appropriate and optimal way through their ability to adapt for survival, growth and prosperity.

One of the most important phenomena that the university environment is witnessing nowadays is digital transformation in order to provide educational services in an organized and accurate manner and within a record time in light of the high degree of competition and its intensity in the work environment within a blood-red environment of competition, where digital transformation enables universities to access and seize opportunities, which enhances obtaining a sustainable competitive advantage. In light of this, the problem of the study is summarized accurately by answering the following main question:

What is the impact of digital transformation on strategic performance the intermediate role of innovation in Jordanian private universities?

This paper aims to identify the impact of innovation as an intermediate variable between digital transformation in its dimensions (Digital Strategy, Digital Culture, digital leadership, digital capabilities, digital infrastructure) and strategic performance in its dimensions (financial dimension, customer dimension, internal operations dimension, growth and learning dimension, sustainable environmental dimension) at Jordanian private universities.

Theoretical Framework

Digital Transformations (DT)

Digital transformation It is considered adopting a new mindset and culture for the organization in order to implement the latest digital technological developments. With the aim of creating greater value for customers, innovating information-based products and services, improving operational processes, using resources efficiently, and increasing the amount of digital knowledge among employees, in addition to developing sustainable business models that establish a competitive advantage (Tanushev, 2022). Despite the many dimensions of digital transformation according to the research field in which it was addressed and the intended goal of digital transformation, the study will adopt five dimensions of digital transformation as follows:

Digital strategy represents the presence of a plan that defines the objectives and procedures necessary for the organization to achieve the success of the process of converting activities to a digital system, and is emerging and consistent with the general strategy of the organization. It also indicates the extent of use of digital technologies and achieving the changes required to create value and reflect those changes on the financial aspects, the core of any digital strategy must refer to the financial aspect, since the strategic focus of any organization is primarily focused on sustainable growth and achieving profits in the long term (Matt et al., 2015).

Moreover, Hobbs (2001) Indicated that digital culture means the ability for individuals to access digital information and work on analyzing and sharing it within diverse and different frameworks to serve work goals. Deuze (2005) argues that this digital culture emerges from communicative practices and actions both online and offline, which are shaped by arrangements and activities in “new” and “old” media, in which the distinction becomes unnecessary as all media converge in overall design.

The third dimension refers to Digital leadership which means a style of leadership that requires basic skills in computers, technologies, and communications to contribute to enhancing and developing knowledge that occurs through the optimal use of digital technology (Oberar & Erkollar, 2018).

And Digital Capabilities as a fourth dimension that represent one of the most prominent defined as skills necessary to go beyond information technology and include social media and mobile technologies, in addition to analytical skills to increase value by taking advantage of Big Data (Westerman et al., 2012). It is addressed by (Tams et al., 2014). It is an intensive dissemination of communications and information technologies through the organization and the ability to develop its organizational resources and work to mobilize those resources and use them more effectively, such as customer relationship management, product development, and knowledge integration. Burke and Evans (2020) believe that digital capabilities are what help adapt and adjust in a learning environment and contribute to

achieving a developed society, as they help employees in organizations design and innovate programs and work plans in a way that meets business needs.

Finally, Digital Infrastructure It refers to the availability of terrestrial cables in addition to the presence of devices and towers to allow the provision of range services within a geographical area (Smith et al., 2020). Digital infrastructure is also defined as the presence of computers in laboratories and laboratories, the work of connecting the Internet, and the possibility of providing some smart departments equipped with digital technology applications (Abitia & Correa, 2021).

Strategic Performance (SP)

Performance is a vital and fundamental issue in organizations, as all organizations strive, especially with the complexity of the external environment, increased competition and many challenges to maintain their performance level and continue to improve and develop it strategic performance is considered to reflect and visualize the future performance of organizations and their ability to reach their desired goals, and balanced scorecard is one of the most important measures of strategic performance, the (BSC) appeared for the first time by researchers Kaplan and Norton in 1992 as a model aimed at translating the vision and strategy of the organization into goals and metrics through four view: Financial perspective, customer perspective, internal business operations perspective, learning and growth perspective (Kaplan, 2009).

The Balanced Scorecard works to achieve the goals through the following dimensions: the financial dimension, the customer dimension, the internal operations dimension, the growth and learning dimension, and the sustainable environmental dimension (Huang & Chwo, 2004) these dimensions will be discussed in some detail as follows:

The Financial Perspective: Kaplan & Norton (1996) showed that financial metrics and their goals vary depending on the stages of the life of organizations in the growth phase, the organization is at the beginning of its life cycle and seeks to increase sales and sales in the markets and obtain new customers. The financial dimension answers the question " in order to achieve success, what should be done for shareholders? It is considered one of the most important axes for measuring and evaluating performance, and this perspective represents metrics aimed at achieving goals, identifying profit levels and working to reduce the level of costs compared to the costs of competing organizations (Idris and Al-Ghalbi, 2007, 171).

The second perspective: Kaplan & Norton (2000) determined that the customer dimension includes the main metrics: market share, customer retention, new customer acquisition, customer satisfaction, and customer profitability, and this dimension seeks to answer the question " to achieve visibility, how should customers see us? This dimension is considered a qualitative measure to measure performance and shows the compatibility between the perceived performance of the product with the performance expected by the customer. Since this dimension is based on how organizations appear in front of customers, where customers should be taken care of and look for their needs in order to maintain them, through analyzing the main components of the market, and the target customer segments in the market, especially that the organization's customers do not qualify as homogeneity in terms of their different tastes and requirements, where they differ between customers, the difference and diversity in customer preferences calls the organization to seek and do a lot of detailed studies to find out about those changing and diverse needs, all this has led to the fact that the customer perspective is one of the most important dimensions of measuring and evaluating the strategic performance of organizations (Wheelen et al., 2012 ,358).

Internal Operations Perspective: Kaplan & Norton (1996) pointed out the need to identify the critical processes in which the organization must outperform competitors in order to enable it to provide added value to customers across target markets, in addition to meeting the wishes and expectations of owners by achieving appropriate financial returns, and when there is a clear perception of the organization about financial perspectives and customers will be able to identify activities that make it able to add value and work to improve them continuously to provide to customers and thus improve productivity to achieve the desired financial goals (Kaplan & Norton, 2000).

Learning and Growing Perspective: Kaplan and Norton (1992) explained that this dimension depends on continuous efforts and striving to invest intangible assets represented by human capital and work on developing internal skills and capabilities of employees that contribute to supporting internal processes in order to create value, which is reflected on improving the efficiency and productivity of business, and leads to higher profits and a better reputation, as the organization is interested in. This dimension also includes the answer to the question "How can an organization enhance its ability to continuously improve and create value?".

Sustainable Environmental Perspective: The process of drafting the Sustainability Balanced Scorecard demonstrates the mechanism of integrating environmental and social issues with the organization's business management, and the process is designed so that it can be applied regardless of whether the traditional scorecard already existed before integrating environmental and social aspects or not, therefore the concept of SBSC is a broad concept, which means that it can be applied to integrate environmental and social aspects in the successful implementation of both "traditional" organizational strategies and sustainability strategies in organizations (Figge, 2002). While many organizations are aware of the importance of the strategic dimension in environmental management and are oriented towards creating environmental management systems and considering the costs associated with the environment as an important dimension of the budget there are many departments that consider this aspect expensive in addition to the weakness and lack of tools for regulation and control of environmental efforts (Staniskis & Stasiskiene, 2006).

Innovation (INN)

Innovation is considered one of the most important trends for business organizations, through which sustainable value can be added across a group of business activities, this concept is also receiving increasing attention in business organizations because of its great importance in business development and determining performance costs. Accordingly, theoretical literature has diversified in dealing with innovation in several areas. The concept of innovation will be highlighted. Innovation is the provision of new useful and applicable ideas and working to translate those ideas through their application to contribute to creating value, which is what organizations can rely on in the field of business, which leads to adaptation to rapid changes in the external environment in addition to the changes that occur in needs and desires Clients (Elsbach and Hargdon, 2006). Innovation is linked to the extent of work on developing products in all their forms, goods and services, and developing processes that contribute to obtaining products, such as changing methods of providing services, for the purpose of reducing costs, improving the quality of products, or creating new products (Lin & Hui, 2008). Majeed (2017) believes that innovation is a capability that characterizes business organizations, and through these capabilities, they seek to work on modernizing and developing their business procedures, in addition to the possibility of developing their human resources, which enhances their operations, and seeks to develop current products or the

ability to create new products to maintain the desired competitive position, which It contributes to increasing its market share.

Research Model and Hypothesis Development

Research Model

The proposed research model reflects higher and lower – order constructs. (Figure 1)

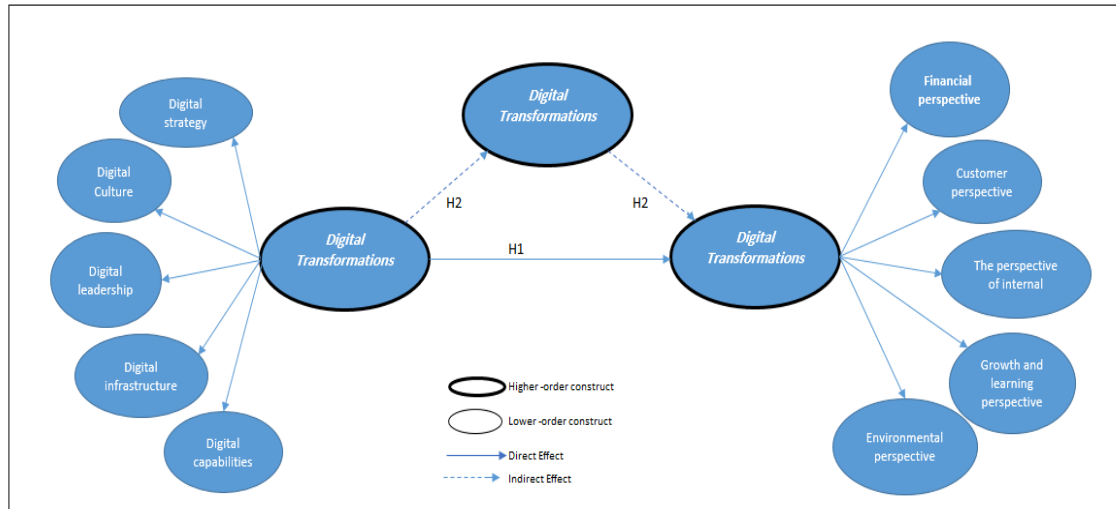


Figure 1. Research Model

Hypothesis Development

Digital Transformation & Strategic Performance.

It is the duty of researchers to investigate the relationship between digital transformation and in different, complex and competitive work environments, according to that the research assesses the relationship between DT and SP by positive significant.

Merdin et al (2023) They found that digital transformation has become important in bringing about business change and creating organizational value, which means that digital transformation makes the company undergo a tangible change in its digital systems, rethinking workflows, and manual operations can become completely digital operations, within the scope of the developed model, items related to environmental and social responsibility, energy management, and product restoration activities were included, and because the model addresses companies of all sizes and all sectors.

Also, Atiya study (2022) concluded that there is a statistically significant impact of the strategy as one of the requirements for applying digital transformation in improving the level of strategic performance in industrial companies listed on the Egyptian Stock Exchange, the study aimed to identify the impact of digital transformation in strategic performance in industrial companies listed on the Egyptian Stock Exchange.

The results of the AL-Sawat and Al-Harbi study (2022) showed that the majority of respondents strongly agree that there is an impact of digital transformation on the academic performance of university faculty members at King Abdul-Aziz University, as there is a possibility to achieve the requirements of digital transformation in order to reach the efficiency of academic performance of faculty members at King Abdul-Aziz University, which in turn reflects on the strategic performance positively.

Furthermore, the study of Khatib and Alshawabkeh (2022) concluded that although digital transformation has a very good impact on Human Resource Management, Digital Human

Resource Management is an intermediate variable in the relationship between digital transformation and strategic superiority, or even a partial mediator.

Hence, the first main hypothesis is saying

H1: DT have a direct impact on SP at Private Universities in Jordan.

Digital Transformation & Strategic Performance & Innovation.

Reviewing the literature regarding the relationship between the DT and SP and INN show a Extent of impact. Show the study of Al Rumaidi and Abu Zaid (2021) aimed to explore the intermediate role of both strategic vigilance and organizational innovation in the relationship between digital transformation in achieving strategic goals in Egypt Air, and concluded that there is a high degree of availability of digital transformation requirements in Egypt Air, where digital security is available, and the organizational culture supporting digital transformation, the results of the study highlighted that Egypt Air's interest in enhancing its level of organizational innovation.

Moreover, Li et al (2023) The aim of this study was to provide a model proposal for two organizations investing in digital transformation through the impact of the digital industry and the digitization of companies on enterprise innovation as a very important research topic and to assess the impact of digital transformation on enhancing innovation outputs, the results indicated that the digitization of companies and the level of innovation in the regional digital industry can The level of innovation in the regional digital industry has a greater impact on the promotion of innovation

Also, the results of a scientific paper examining the relationship between the use of digital technologies and innovation performance for a sample of small and micro enterprises in South Africa show that selected digital communication technologies, including the use of social media and business mobile phones to browse the Internet, have a positive impact on innovation, and that innovation is conditional on the use of these Technologies have a positive impact on labor productivity (Gaglio et al., 2022).

Additionally, The Al-Obaid study (2020), which aimed to find out the relationship between innovation and performance and whether innovation has an impact on performance, through performance in its dimensions (internal factors affecting performance, external factors affecting performance) and innovation in its dimensions (strategy, leadership, teamwork, organizational culture), found that Syrian organizations contribute to submitting proposals and new business ideas, and the participation of employees and their superiors in the work by setting goals and working to achieve them, the study recommends encouraging employees to innovate by training employees on innovation techniques and allocating to enroll employees in training programs to hone their talents And their skills to contribute to raising the productivity of organizations.

Consequently, the 2nd main hypothesis is saying

H2: INN mediates the relationship between DT & SP at the Private Universities in Jordan.

Research Method

This paper utilized a cross-sectional approach to evaluate the proposed model. Data was gathered from eighteen private universities in Jordan, using a quantitative design that aligns with a deductive approach. The research methodology employed in this study was primarily quantitative, encompassing both descriptive and analytical methods. This approach was

chosen for its compatibility with the study's nature and objectives, aiming to gain a precise understanding of the elements of the phenomenon under investigation. The study focused on collecting data from members of the study community to analyze the variables, with DT as the independent variable, SP as the dependent variable, and INN as an intermediary variable. To test the hypotheses and address the research questions, the study examined responses from senior and middle management personnel in Jordanian telecommunications companies. The data was gathered through a study questionnaire, and the results were analyzed to draw conclusions (Saunders et al., 2019, p. 166; Sikaran & Bogi, 2016, p. 97).

Sample

A random stratified sample was selected due to its compatibility with the nature of the study, as the number of employees in senior and middle management is not the same as in private Jordanian universities.

To improve the accuracy of the results and ensure that the sample is representative of the community, and in anticipation of the recovery rate, (250) questionnaires were distributed through an electronic link using (Google Forms) and based on the equation (number of school principals in the university number of school principals in the study community) * sample size, in order to ensure the recovery of a number that does not affect the quality of the analysis output, (209) responses were recovered, with an average of (83.6%), which is one of the high recovery rates as shown (Baruch & Holtom, 2008). due to the importance of a high response rate in order to ensure that the study sample represents the target population and avoid bias, knowing that all responses were valid for analysis due to the link setting mechanism of Google Forms, which did not allow passage of a paragraph without an answer, and the sample as shown in Table 1.

Table 1
Study Sample

#	University Name	Number of Managers	Sample Size	Recovery
1	Amman Arab University	32	16	14
2	Middle East University	38	19	16
3	Jadara University	29	15	12
4	Al Ahliya Amman University	36	18	16
5	University of Applied Sciences	29	15	12
6	Philadelphia University	35	18	15
7	Isra University	31	16	13
8	University of Petra	31	16	13
9	Zaytuna University of Jordan	30	15	15
10	Zarqa University	34	17	16
11	Irbid National University	20	10	8
12	Jerash private University	27	14	11
13	Princess Sumaya University	24	12	10
14	Ajloun National University	24	12	11
15	Aqaba University of Technology	25	13	13
16	Avicenna Medical University	12	6	6
17	American University-Madaba	20	10	0
18	Aqaba University of Medical Sciences	15	8	8
TOTAL		492	250	209

Source: Own elaborations from authors

Measures

The research used a questionnaire to gather primary data, which was designed based on the study's variables, relevant literature, and previous research. The questionnaire included (69) items rated on a five-point Likert scale, chosen for its compatibility with different analytical methods like factor analysis and structural equation modeling.

Analysis Tool

Hair et al (2022) believes that the use of utilized the SmartPLS4 software to conduct a partial least squares (PLS) analysis in order to examine the direct and indirect effects of the variables and their dimensions. Additionally, the study utilized the Structured Equation Modeling (SEM) approach, which enables the examination of distinct relationships among groups of dependent variables. This method also offers an efficient estimation technique for multiple regression equations estimated simultaneously, consisting of two key components: the structural model and the measurement model.

Result**Descriptive Statistics**

In this particular we will analyze the responses of the sample members to describe the dimensions of the study variables, as presented in Table 2. It is worth noting that all variables in Table 2 exhibited a normal distribution, with Skewness values remaining very low and well within the acceptable threshold ($\#2.0$), falling within the range of +1 to -1 (Hair et al., 2022).

Table 2

Descriptive Statistics

Construct	Mean	Standard deviation	Skewness	Kurtosis
DT	4.03		-0.276	-0.591
SP	4.06		-0.370	-0.654
INN	3.94		-0.369	-0.391

Source: Own elaborations from authors

Measurement Model Evaluation

In the present study, a reflective model based on the Classical Test Theory was utilized. This choice was made due to the fact that the indicators being measured are reflective of underlying latent variables that influence them. As a result, the impact is from the latent variable to the indicators (Hair et al., 2022, pp. 51-52).

Convergent Validity

This indicator assesses the degree to which the items in the questionnaire used to assess the variable or its dimensions converge, ensuring a strong connection between the items measuring the variable (Hair et al., 2022). Table 3 demonstrates that convergent validity was evaluated using four indicators: Outer Loadings, Cronbach's Alpha coefficient, Composite Reliability (CR), and Average Variance Extracted (AVE).

Table 3

The reflective measurement models reliability and validity

Internal Consistency Reliability						
Construct	Indicators	Outer loading	Average Variance Extracted	Cronbach's Alpha	Reliability (rho_a)	Composite Reliability (rho_c)
		>0.70	>0.50	>0.70	>0.70	>0.70 and >0.95
DTS	DTS1	0.768	0.640	0.888	0.892	0.914
	DTS2	0.752				
	DTS3	0.847				
	DTS4	0.785				
	DTS5	0.824				
	DTS6	0.821				
DTC	DTC1	0.774	0.655	0.894	0.895	0.919
	DTC2	0.817				
	DTC3	0.830				
	DTC4	0.824				
	DTC5	0.832				
	DTC6	0.776				
DTL	DTL1	0.801	0.674	0.903	0.903	0.925
	DTL2	0.797				
	DTL3	0.828				
	DTL4	0.843				
	DTL5	0.845				
	DTL6	0.809				
DTCA	DTCA1	0.863	0.667	0.899	0.905	0.923
	DTCA2	0.836				
	DTCA3	0.813				
	DTCA4	0.876				
	DTCA5	0.701				
	DTCA6	0.798				
DTI	DTI1	0.828	0.715	0.920	0.921	0.938
	DTI2	0.841				
	DTI3	0.833				
	DTI4	0.893				
	DTI5	0.856				
	DTI6	0.822				
SPF	SPF1	0.793	0.578	0.817	0.828	0.872
	SPF2	0.812				
	SPF4	0.737				
	SPF5	0.660				
	SPF6	0.790				
	SPC	SPC1				
SPC2		0.829				
SPC3		0.884				

	SPC4	0.851				
	SPC5	0.742				
	SPC6	0.784				
SPI	SPI1	0.806	0.649	0.892	0.893	0.917
	SPI2	0.798				
	SPI3	0.853				
	SPI4	0.795				
	SPI5	0.803				
	SPI6	0.776				
SPG	SPG1	0.814	0.719	0.922	0.923	0.939
	SPG2	0.841				
	SPG3	0.886				
	SPG4	0.857				
	SPG5	0.879				
	SPG6	0.809				
SPE	SPE1	0.804	0.666	0.900	0.903	0.923
	SPE2	0.781				
	SPE3	0.817				
	SPE4	0.839				
	SPE5	0.853				
	SPE6	0.801				
INN	INN1	0.840	0.709	0.949	0.950	0.956
	INN2	0.844				
	INN3	0.868				
	INN4	0.851				
	INN5	0.865				
	INN6	0.841				
	INN7	0.862				
	INN8	0.817				
	INN9	0.785				

Source: Own elaborations from authors. Note: DTS: Digital strategy, DTC: Digital Culture, DTL: Digital leadership, DTCA: Digital capabilities, DTI: Digital infrastructure, SPF: The financial dimension, SPC: Customers dimension, SPI: Internal operations dimension, SPG: Growth and learning dimension, SPE: Environmental dimension, INN: Innovation. All indicators have *P-value*=0.00

Table 3 show that the values of reflective indicator outer loading for all items of the study were above (0.70) Hair et al (2022, p. 80), Except for item S PF5 where the outer loading was (0.660).

According to Hair et al (2022, p. 80), CR values should be higher than 0.70 to demonstrate a high level of reliability in the measurements, while the AVE should be greater than 0.50. Table 3 confirms that all CR values are above 0.70 and AVE values exceed 0.50, indicating that the data is suitable for statistical analysis.

Discriminate Validity

This measure assesses the degree of distinctiveness between each variable or dimension; in other words, items within a variable do not duplicate or coincide with items in another dimension or variable (Hair et al., 2022, pp. 78-80). The researcher utilized two criteria

(Fornell-Larcker and Heterotrait-monotrait ratio analysis) to evaluate the discriminant validity, as following:

The correlation values between the variables and dimensions in the rows and columns are smaller than the square root of each AVE value (Hair et al., 2022, p. 80). The coefficients in Table 4 demonstrate that all of them are statistically significant. This is due to the fact that the intersection value of each dimension with itself is more significant than its intersection with any other dimension in the matrix. Hence, the study variables are unique and distinct from one another, indicating their independence and absence of overlap.

Table 4
Discriminate Validity Fornell- Larcker

	INN	DTS	DTI	DTC	DTCA	DTL	SPF	SPE	SPC	SPI	SPG
INN	0.842										
DTS	0.688	0.8									
DTI	0.727	0.723	0.846								
DTC	0.661	0.775	0.687	0.809							
DTCA	0.708	0.772	0.788	0.786	0.816						
DTL	0.717	0.785	0.727	0.786	0.799	0.821					
SPF	0.714	0.701	0.69	0.656	0.703	0.673	0.76				
SPE	0.807	0.632	0.654	0.553	0.629	0.631	0.655	0.816			
SPC	0.751	0.669	0.644	0.609	0.64	0.636	0.758	0.684	0.825		
SPI	0.778	0.693	0.718	0.647	0.688	0.68	0.765	0.702	0.747	0.806	
SPG	0.795	0.571	0.64	0.631	0.619	0.606	0.652	0.769	0.717	0.702	0.848

Source: Own elaborations from authors. Note: DTS: Digital strategy, DTC: Digital Culture, DTL: Digital leadership, DTCA: Digital capabilities, DTI: Digital infrastructure, SPF: The financial dimension, SPC: Customers dimension, SPI: Internal operations dimension, SPG: Growth and learning dimension, SPE: Environmental dimension, INN: Innovation.

Table 5

Heterotrait- Monotrait Ratio- HTMT

	INN	DTS	DTI	DTC	DTCA	DTL	SPF	SPE	SPC	SPI	SPG
INN											
DTS	0.743										
DTI	0.774	0.795									
DTC	0.714	0.864	0.752								
DTCA	0.759	0.858	0.858	0.874							
DTL	0.772	0.870	0.793	0.872	0.883						
SPF	0.794	0.809	0.776	0.760	0.809	0.767					
SPE	0.869	0.700	0.716	0.606	0.689	0.694	0.736				
SPC	0.805	0.743	0.701	0.671	0.701	0.699	0.869	0.738			
SPI	0.842	0.780	0.790	0.723	0.765	0.757	0.888	0.775	0.829		
SPG	0.853	0.629	0.693	0.695	0.673	0.664	0.741	0.838	0.777	0.771	

Source: Own elaborations from authors. Note: DTS: Digital strategy, DTC: Digital Culture, DTL: Digital leadership, DTCA: Digital capabilities, DTI: Digital infrastructure, SPF: The financial dimension, SPC: Customers dimension, SPI: Internal operations dimension, SPG: Growth and learning dimension, SPE: Environmental dimension, INN: Innovation.

According to Hair et al (2022, pp. 79-80), the HTMT ratio values should not surpass 0.85 for theoretically similar variables and should not exceed 0.90 for theoretically different variables. Upon reviewing the results in Table 4, it is evident that all values are within acceptable limits and are below 0.90.

Structural Model Assessment Procedures

Once the measurement model's reliability and validity have been assessed, the study will move on to evaluating the structural model. This will involve analyzing the coefficient of determination R^2 , effect size f^2 , predictive relevance Q^2 , and the statistical significance of the structural path coefficients (Hair et al., 2022, p.116). Unlike the measurement model, which focuses on the nature and meaning of the relationship between variables, the structural model is concerned with studying the actual relationship between variables.

Structural Model Collinearity Assessment (VIF)

The absence of multi collinearity among the study variables in the structural model has been verified through the VIF coefficient, with all values in Table 5 falling below the threshold of 5 as reported by Hair et al. (2022).

Table 6

Collinearity Statistics

Construct	INN	SP
INN		3.242
DT	1.000	3.106

Source: Own elaborations from authors

Model's Explanatory Power Assessment

The coefficient of determination R^2 for endogenous constructs is a measure of the model's explanatory or in-sample predictive power, ranging from 0 to 1. Higher values indicate stronger explanatory power. In various social scientific disciplines, R^2 values of 0.75, 0.50, and 0.25 are classified as high, moderate, and poor, respectively. Nevertheless, acceptable R values can differ based on the research context, with some fields accepting values as low as 0.10 (Hair et al., 2022, p. 118).

Table 7

Coefficient of Determination (R^2)

Construct	R^2	R^2 adjusted
INN	0.826	0.823
DT	0.607	0.605

Source: Own elaborations from authors

Table 7 shows that the R^2 value for the dependent variable SP in Jordanian private universities is 0.826, meaning that 82.6% of the variance in SP can be explained by the study model (DT and INN), with the remaining 17.4% attributed to other factors.

This demonstrates the model's effectiveness in explaining and predicting SP, with a percentage well above the acceptable threshold of 0.65 (Hair et al., 2022, p. 195). Additionally, the results reveal that DT accounts for 60.7% of the variance INN within the universities surveyed, further supporting the model's predictive capabilities.

Effect size (f^2)

The effect size f^2 indicates the extent to which each independent variable can account for changes in the dependent variable. It signifies the percentage of the variance that can be attributed to the independent variable. According to Hair et al (2022, p.196), values below 0.02 are considered weak, those between 0.15 and 0.35 are moderate, and values above 0.35 are deemed to have a significant impact. Table 8 displays the f^2 results, which suggest a strong effect.

Table 8

 f^2 Effect size

Construct	f^2
DT → SP	0.127
DT → INN	1.547
INN → SP	0.505

Source: Own elaborations from authors

Hypothesis Testing

The study employs the Partial Least Squares Structural Equation Modeling (PLS-SEM) and the Smart PLS 4 software to examine two main hypotheses. by using PLS 4 software will examine two primary hypotheses. PLS analysis and path coefficients are utilized to assess the importance of relationships in the structural model.

Firstly, investigate the direct impact of DT on SP, as well as test the direct impact of the independent variable (DT) on the dependent variable (SP).

Table 9

Result of the significance test for the path coefficients (Direct impact)

	Hypothesis	Original sample	Sample mean	R ²	Standard deviation	T Value	P values	Confidence Intervals (95%)	It is significant? (p<0.05)	Status
DT	H1	0.262	0.264	0.607	0.071	3.696	0.000	[0.120-0.399]	Yes	supported
	→ SP									

Source: Own elaborations from authors. Note: t value more than 1.96; DT: Digital transformations, SP: Strategic performance

To test the direct impact of DT with its dimensions (Digital strategy, Digital Culture, Digital leadership, Digital capabilities, Digital infrastructure) on SP with its dimensions (Financial perspective, Customer perspective, internal processes perspective, Growth and learning perspective, Environmental perspective), as stated in the first main hypothesis, it appears from Table 9 that there is a direct relationship between DT and SP in Jordanian private universities.

The test results showed that the β value reached (0.415), a positive, direct, and statistically significant relationship at a significant level (p-value) of (0.05) between DT and SP. The results also indicated that the calculated value of (t) reached (6.327), which is higher than (1.96). The significance level (p-value) reached (0.000), which is less than the significance level ($\alpha \leq 0.05$). Based on these results, the acceptance of the first main alternative hypothesis (H1) is confirmed.

Table 10

Result of the sig. test for the path coefficients (Specific indirect impact)

	Hypothesis	Path coefficient (β)	T Value	P value	Confidence Intervals (95%)	It is significant? (p<0.05)	Status
DT --> INN							
-->SP	H2	0.415	6.327	0.000	[0.278 0.536]	Yes	supported

Source: Own elaborations from authors. Note: t value more than 1.96; DT: Digital transformations, SP: Strategic performance, INN: Innovation.

According on Table 10, the second main hypothesis was tested, showing the indirect relationship between DT and SP with INN as a mediating variable in Jordanian private universities. Preacher and Hayes (2008) indicated that Two requirements are met to ensure the calculation of the mediator hypothesis:

The first requirement is to ensure that there is a significant relationship between the independent and dependent variables through the mediator with statistical significance at a significance level ($\alpha = 0.05$) after bootstrapping. The first condition was achieved as the p-value was less than (0.05), while the t-value was higher than (1.96) was determined by Hair et al (2022, p. 154); Anderson et al (2020, p. 433), and the β value for the impact was indirect (0.415).

The second requirement: After bootstrapping, the confidence values must be verified. (Lower-Level and Upper-Level Interval) so that zero does not interrupt these values. Path (a) represents the first path, the relationship between DT in its dimensions and INN. The value of B for the first path was (0.779). It is noted that the value of (LL) and (UL) is not interrupted by

zero, which fulfills the second condition for mediation for the first path. Mediation here is partial mediation, as the β value is less than (0.80).

Table 11

Result of the significance test for the path coefficients (total impact)

	Path coefficient (β)	T Value	P value	Confidence Intervals (95%)	It is significant? ($p < 0.05$)
DT - - >SP	0.415	6.327	0.000	[0.302- 0.585]	Yes

Source: Own elaborations from authors. Note: t value more than 1.96; DT: Digital transformations, SP: Strategic performance, INN: Innovation

To verify the direct effect coefficients and the total standardized effect of the paths of the study model, the direct and indirect impact of these paths was measured, as shown in Table 11. While the second path (b) represents the relationship between INN and SP in it dimensions, the β value for the second path reached (0.415). It is noted that the values of (LL) and (UL) are not interrupted by zero, as the value of β is less than (0.80). Based on these results, the acceptance of the second main alternative hypothesis (H2) is confirmed.

Discussion and Conclusion

This paper investigates the mediating role of INN between DT and SP. based on the findings of this study, DT has a statistically significant impact on SP in Jordanian private universities (confirms the first main hypothesis, H1). The study concluded that Jordanian private universities are considered one of the organizations seeking digital transformation by promoting awareness of the importance of innovation in all fields, whether administrative or service provision, which in turn affects strategic performance positively, especially that digital transformation consists in redesigning business models, which include processes, activities and procedures in order to achieve the desired goals, which reflects all this on strategic performance.

This result is due to the belief of private university managements in the importance of digital transformation because of its positive results at all levels, especially that there is an increasing demand from academic institutions towards e-learning and distance learning, and in the same context, digital transformation enables Jordanian private universities to expand in this direction because of the technologies and methods it provides that contribute to achieving these goals through enhancing investment in technological technologies that work to provide new services in addition to attracting new customers, taking into account the retention of existing customers, which reflects positively on the strategic performance of those universities.

Moreover, the findings of the primary hypothesis align with the existing theoretical literature, indicating that modern business entities can enhance their performance by embracing digital transformation. This adoption enables organizations to attain their objectives more efficiently and swiftly, ultimately leading to a superior strategic performance. Merdin et al (2023) In their study discovered that digital transformation plays a crucial role in driving business transformation and generating value for organizations. This indicates that digital transformation leads to a significant shift in a company's digital infrastructure, prompting a reevaluation of processes and the transition from manual to fully digital operations.

Furthermore, Khatib and Alshwabkeh (2022) research findings indicated that while digital transformation positively affects Human Resource Management, Digital Human Resource Management serves as a mediator or intermediate variable in the connection between digital transformation and strategic superiority.

Notwithstanding the differences in the study Population nevertheless there is a study conducted by Atiya (2022) found that implementing a digital transformation strategy has a significant impact on enhancing the strategic performance of industrial companies listed on the Egyptian Stock Exchange.

The study also Explained that INN mediates the relationship between DT and SP at Jordanian private universities (confirms the second main hypothesis H2).

The researchers believe that this is due to the environment of universities enhanced by a culture of INN related to DT and the keenness of Jordanian private universities to provide "digital" technological technologies that contribute to enhancing operations strategically and providing innovative services continuously, which enhances confidence among employees in order to adopt the concept of innovation and expand the scope in general in academic institutions, Hence it will reflect in the SP at Jordanian private universities In particular and academic institutions in general.

Moreover, DT has become one of the main priorities for most business organizations and bodies seeking to develop and improve their services and facilitate their access to beneficiaries, including Jordanian private universities. DT does not mean just the application of technology within organizations, but represents an integrated and comprehensive program that touches on the way organizations work and how to provide products (goods, services) to their customers within the target segment and provide them easier and faster. in addition, DT pays attention to the mechanism of using technology in organizations, it contributes to improving operational efficiency and improving the services they provide to customers and the target audience of those services.

Furthermore, the integration of DT and INN leads to greater added value. This can be seen in the transformation of ways of providing services to reduce costs, improve product quality, introduce new products that include both goods and services. INN plays a crucial role in promoting products across different sectors, as well as in improving organizational processes to achieve their goals, which ultimately leads to positive results reflected on SP.

Findings of the second hypothesis Get along with the existing theoretical literature, the study by Al Rumaidi and Abu Zaid (2021) concluded that there is a high degree of availability of digital transformation requirements in Egypt Air, where digital security is available, and the organizational culture supporting digital transformation. The results of the study also highlighted that Egypt Air is interested in enhancing its level of organizational innovation, as the study aimed to explore the intermediate role of both strategic vigilance and organizational innovation in the relationship between digital transformation in achieving strategic goals.

Moreover, Li et al (2023), show digitization of enterprises and the level of innovation in the regional digital industry can have a greater impact on promoting innovation in the industry, as the study aimed to provide a model proposal for two organizations investing in digital transformation through the impact of the digital industry and the digitization of enterprises on innovation.

In conclusion INN mediates the relationship between DT and SP at Jordanian private universities. Hence, DT and INN are critical elements for achieving SP at Jordanian private universities.

Implications

Theoretical Implications

This study has theoretical implications. From a theoretical point of view, it provides empirical evidence of the intermediate impact of innovation on the role of digital transformation in strategic performance in Jordanian private universities.

Studies indicate that digital transformation can contribute to enhancing the strategic performance of Jordanian private universities. For example, it can innovatively redesign business models with the aim of improving processes and simplifying procedures by promoting investments in technological technologies to increase efficiency and improve quality. Thus, it can enhance service, customer satisfaction and improve performance for universities in general. This study highlights its importance in responding to the growing technological developments for competitive positioning in a turbulent environment and also highlights the digital transformation as a business method that requires moving proactively in order to seize opportunities in the external environment. Researchers should investigate the main factors that may lead to improving the strategic performance of private universities due to digital transformation, so further studies are Required.

Practical Implications

The study has practical implications, including simplifying procedures, designing and innovating business models that fit the nature of work during the technological boom, in addition to raising the level of efficiency, in addition to proactive planning in order to achieve goals, focusing on knowledge aspects and investing in human capital through developing their capabilities in relation to digital transformation issues, which reflects on their performance more effectively.

Moreover, this study also contributes to enhancing the continuous pursuit of finding outstanding services through the innovation of processes and products, therefore, digital transformation contributes to increasing innovation opportunities in such environments, and this contributes to increasing sales and profits, and this leads to further growth and continuing to provide the best services in a highly competitive environment.

Limitations

Conducting more research on the variables of study and society is very important, as the study mainly dealt with Jordanian private universities. Therefore, more studies are expected to be conducted to study the relationship between the study variables (Digital Transformation, Strategic Performance, Innovation) in the educational sectors, institutes and global schools in general in general with the aim of increasing the ability to generalize the results.

This study adopted digital transformation as an independent variable with its five dimensions (Digital Strategy, Digital Culture, digital leadership, digital capabilities and digital infrastructure), while it is possible to study through other dimensions, as previous studies have dealt with, such as digital organizational structure, digital management, digital operations and digital business model. The study also dealt with strategic performance as a dependent variable through the following four dimensions: financial perspective, customers, internal operations, growth, learning and sustainable environmental perspective it is possible to study other dimensions, as previous studies have dealt with, such as efficiency, effectiveness, quality, timing and productivity. the current study considered that innovation is an intermediate variable, and it is possible to study other dimensions as an intermediate variable, such as cybersecurity, big data, artificial intelligence.

Also, this study is one of the applied studies that was based on the questionnaire in order to collect preliminary data, and other methods can be followed, such as Case Study, interviews and quantitative approaches to avoid some limitations facing the distribution of questionnaires and the percentage of responses.

Scientific Contributions for this paper: Digital transformation has a positive impact on strategic performance in Jordanian private universities & Innovation plays a vital and important role in the relationship between digital transformation and strategic performance, especially since innovation is considered one of the most prominent axes in the era of digital transformation. Digital transformation become one of the main priorities for most business organizations and bodies seeking to develop and improve their services and facilitate their access to beneficiaries, including Jordanian private universities. digital transformation does not mean just the application of technology within organizations, but represents an integrated and comprehensive program that touches on the way organizations work and how to provide products (goods, services) to their customers within the target segment and provide them easier and faster. in addition, DT pays attention to the mechanism of using technology in organizations, it contributes to improving operational efficiency and improving the services they provide to customers and the target audience of those services.

Hence, Jordanian private universities are considered one of the organizations seeking digital transformation by promoting awareness of the importance of innovation in all fields, whether administrative or service provision, which in turn affects strategic performance positively, especially that digital transformation consists in redesigning business models, which include processes, activities and procedures in order to achieve the desired goals, which reflects all this on strategic performance.

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Appendix 1. list of items for DT, SP, and INN Literature sources

Construct	Source
DT	(Madi and & hujair, 2020; Al-Sawat & Al-Harbi, 2020; Hilal, 2021; Amin, 2018; Kamal & Mahmoud, 2022; Al-Shaarawi and Saadoun, 2022; Zeidan, 2021; Al Khateeb & Al Shawabkah : Tuba 2022)
SP	(Bin Ghazal, 2020; al-Arini & adghish, 2016; AL-Janai & abuhadi, 2018; Bahjat et al., 2015; Ali, 2021; Khalaf & Hussein, 2023; Cheowsuwan, 2016)
INN	(Calik, 2017 ; Janssen, 2014 ; Shehadeh, 2023 ; Majeed, 2017)