INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 8, (2025) E-ISSN: 2222-6990

The Impact of Digital Transformation on Entrepreneurial Orientation at Jordanian Pharmaceutical Manufacturing Companies

Kefaia Muhammad Al Musa, Dr. Sawsan A. Alshaer
The World Islamic Sciences & Education University
Email: Kefaiaatrush84@gmai.com, Drsawsan.alshaer@wise.edu.jo

DOI Link: http://dx.doi.org/10.6007/IJARBSS/v15-i8/26053

Published Date: 04 August 2025

Abstract

The study aimed to identify the impact of digital transformation, with its dimensions (digital strategy, digital leadership, and digital capabilities), on entrepreneurial orientation, with its dimensions (innovation, proactivity, and risk-taking) in Jordanian pharmaceutical manufacturing companies. The study population included (126) managers in senior and middle management in these companies. A questionnaire was distributed to them to collect the necessary data; to analyze the data, a number of statistical methods were used, such as arithmetic means, standard deviations, and multiple and simple regression analysis to test the study hypotheses. The study concluded that the relative importance of digital transformation and entrepreneurial orientation was high at Jordanian pharmaceutical manufacturing companies, and that there was a statistically significant impact of digital transformation, with its dimensions (digital strategy, digital leadership, and digital capabilities), on entrepreneurial orientation, with its dimensions (innovation, proactivity, and risk-taking) at Jordanian pharmaceutical manufacturing companies. The study recommended strengthening the digital strategy by adopting long-term plans that integrate digital transformation into the company's overall strategic objectives, continuing to support a culture of innovation within the company, and adopting policies that encourage employees to think creatively and use digital tools to find innovative solutions. It also recommended conducting future studies to explore the relationship between digital transformation and entrepreneurial orientation in other sectors, such as education, banking, and others.

Keywords: Digital Transformation, Entrepreneurial Orientation, Jordanian Pharmaceutical Companies.

Introduction

In a competitive environment characterized by massive technological changes and developments across all social, economic, and other fields, it has become imperative for organizations to establish an organizational culture that encourages sound management

practices to ensure their continuity, however, uncertainty lies in the means and tools that can help organizations adapt to internal and external changes, enable them to respond quickly to disruptions, seize opportunities, and avoid unexpected challenges and threats.

Digital transformation helps organizations manage their businesses electronically to maintain their competitiveness and transform their market space by strategically and prioritizing their activities, processes, competencies, and models to take full advantage of the changes and opportunities provided by a range of digital technologies and their accelerating impact (Upadrista, 2021, 1).

Entrepreneurial orientation is an organizational phenomenon associated with processes, practices, and decision-making that lead to new inputs, it refers to an organization's ability to take initiative and change its competitive business. It reflects an attitude of innovation, courage to take risks, and proactivity, which leads to reengineering the organization and reorganizing its management skills, and producing new, shared resources capable of designing business strategies to proactively respond to the changing environment, seize and benefit from opportunities, and thus enhance its competitiveness and superiority in a complex, dynamic business environment (Ratten, 2020, 46-48).

The problem of the study lies in entrepreneurial orientation at Jordanian Pharmaceutical Manufacturing Companies in light of the changes business organizations are experiencing due to rapid technological developments, this poses challenges to these companies affecting their ability to innovate advanced services that meet customer needs, respond to market changes, and their willingness to take risks to enter new markets, this requires reconsidering their business strategies. By adopting a digital orientation through a digital strategy, effective leadership, and robust digital capabilities, Jordanian pharmaceutical companies may be able to improve their operations and expand their business models, this will enhance their entrepreneurial orientation and their ability to exploit new opportunities and deliver distinguished products that meet customer needs and exceed their expectations, this will, in turn, enable them to achieve sustainable success and excellence in a business environment characterized by change and complexity.

Therefore, the study seeks to investigate the impact of digital transformation on the entrepreneurial orientation of Jordanian Pharmaceutical Manufacturing Companies.

Literature Review

Digital Transformation

The digital revolution has transformed business and how it is conducted, creating tremendous opportunities and threats, this has forced organizations to transform their organizational activities, processes, and efficiencies through the use of digital technologies to fully capitalize on these opportunities and avoid threats (Strømmen-Bakhtiar, 2020, 92).

Digital transformation is an extension of the Fourth Industrial Revolution and a new development paradigm that reshapes the relationships between organizations, their stakeholders, and their customers by offering new services or products (Al-Moaid & Almarhdi, 2024).

Digital transformation is defined as a fundamental change process with diverse impacts on an organization's stakeholders, enabled by the innovative use of digital technologies, resources, and key capabilities designed to radically improve the organization by redefining its value proposition and business models (Liebowitzz, 2025, 67).

Mallisetty (2023, 9) described digital transformation as a profound and deliberate overhaul of business activities, processes, and models to harness the capabilities and potential offered by digital technologies, it is not simply about moving from paper to screens, but rather about leveraging technology to deliver enhanced value not only to customers but to all stakeholders.

Digital Transformation Dimension

Researchers have varied in their classifications of the dimensions of digital transformation. Barba-Sánchez et al. (2024) indicated that the dimensions of digital transformation are: the digital aspect of the company and the level of transformation. Xu et al. (2023) used digital strategy and digital capability as dimensions of digital transformation, while Teng et al. (2022) addressed the dimensions: digital technology, digital skills, and digital transformation strategy. In the current study, the researchers will adopt digital strategy, digital leadership, and digital capabilities as dimensions of digital transformation.

Digital Strategy

Digital technology has the potential to reshape an organization's entire strategy to create value and maintain competitive advantage, however, unleashing this power depends on a sound digital strategy (Flink et al., 2024, 20).

A digital strategy addresses organizational processes, issues, and objectives related to digital maturity, it is also called a digital media strategy and is considered a plan that maximizes the benefits of data assets and technology initiatives; therefore, a successful digital strategy requires a cross-functional team, executive leadership, and effective IT (Al-Hadidi et al., 2022).

Teng et al. (2022) reported that a digital transformation strategy is a prerequisite for a successful digital transformation, by developing an effective, clear, and sound digital transformation strategy, organizations can ensure that their digital transformation will be as resilient as possible, a digital transformation strategy is like a customized map that can deliver significant value in transforming businesses and delivering the best customer experience.

Digital Leadership

Digital leadership refers to a leader's ability to create a compelling vision for digital transformation strategies and processes and the ability to effectively implement them (Damayanti & Mirfani, 2021). Digital leadership represents a leadership style that aligns with the requirements of digital transformation, reflecting leaders' ICT competencies and their use in guiding employees toward desired goals (Al-Balawi & Al-Balawi, 2023).

Borowska (2019) defined digital leadership as determining the direction of influence on others to initiate sustainable change, through access to information and forming relationships that facilitate the implementation of pivotal technological changes. He added that digital

leadership must possess several characteristics, including adopting the right mindset and being open to change, while employing relevant skills and cultures to inspire this change with the help of modern technology and continuous innovation.

Chatterjee (2023) emphasized the importance of digital leadership, which manifests itself in encouraging employees to learn digitally, providing them with appropriate training, and motivating them to participate in the digital transformation process to familiarize themselves with the digital workplace.

Digital Capabilities

Organizations judge their business efficiency by looking at their digital capabilities, which refer to what is taken into account when implementing digital transformation, including technical infrastructure, resources, and information technology (Rowles & Brown, 2017, 7).

Teng et al. (2022) described digital capabilities as key to digital transformation, which in turn uses digital properties to replicate, link, feedback, and emulate all aspects of the organization's work.

According to Ma (2023, 77), digital capabilities are the foundation for enabling and rapidly implementing digital transformation in organizations, these capabilities include digitizing users, products, conceptual systems, and more.

Digital capability is a high-level, dynamic capability that helps organizations respond quickly to changes in the internal and external environment and provide innovative digital solutions according to market competition and customer needs (Wang et al., 2022).

Entrepreneurial Orientation

The concept of entrepreneurial orientation stems from the pioneering work of Miller (1983), who demonstrated that entrepreneurial organizations are those that engage in product innovation, tend to enter into risky ventures, and are proactive in innovations that enable them to outperform competitors, thus, entrepreneurial orientation encompasses the dimensions of "innovation, risk-taking, and proactivity".

Lumpkin and Dess (1996) then expanded this framework to include fierce competition and independence, they defined entrepreneurial orientation as the processes, practices, and decision-making activities that lead to new entry, this orientation is characterized by one or more of the following dimensions: the tendency toward independence, the desire to innovate and make decisions, risk-taking, the tendency toward fierce competition, and proactivity regarding market opportunities. This means that any organization that engages in an effective combination of independence, innovation, risk-taking, proactivity, and fierce competition is an entrepreneurial organization.

Entrepreneurial orientation is defined as a strategic orientation that reflects an organization's innovative philosophy in managing its business and enhancing its competitiveness. It is considered one of its most important strategic resources (Teixeira et al., 2019, 72). Susanto et al. (2023, 305) indicated that entrepreneurial orientation is the

orientation that enables an organization to create its own effort to become superior in the market, and that organizations with an entrepreneurial mindset are more innovative, proactive, and willing to take risks compared to other organizations.

Fayolle (2007, 130) also defined entrepreneurial orientation as an organization's search for additional returns based on its resource base through three elements: innovation, proactivity, and risk-taking, these elements, in turn, allow the organization to benefit from more risk-intensive activities, thereby helping it reap entrepreneurial returns or return on investment.

Mazzarol and Reboud (2020, 53) view entrepreneurial orientation as the processes, practices, and decision-making style of an organization operating in an entrepreneurial manner, and includes key elements that define its entrepreneurial behavior, these elements are used to build resources and competencies within the organization to deal with opportunities and threats in the business environment.

Entrepreneurial Orientation Dimensions

The researchers reviewed numerous previous studies in both Arab and foreign contexts that examined entrepreneurial orientation from multiple and diverse dimensions. Some adopted risk-taking, innovation, proactivity, fierce competition, and independence as dimensions of entrepreneurial orientation (Hernández-Linares et al., 2024). Salih et al. (2024) used the following dimensions of entrepreneurial orientation: innovation, proactivity, risk-taking, and flexibility. Others adopted the dimensions of risk-taking, innovation, and proactivity as dimensions of entrepreneurial orientation (Satar et al., 2024; Bouhalleb & Messeghem, 2024). These are the dimensions researchers adopted for entrepreneurial orientation in the current study.

Innovation

Innovation defined as the efforts made by an organization in the pursuit of new products, processes, or business models (Bouhalleb & Messeghem, 2024). Through the organization's tendency to implement and promote new ideas, creative processes, and research and development (Teixeira et al., 2019, 72).

Susanto et al. (2023, 305) noted that innovation is more like a climate or culture than a oriented outcome, it is defined as an organization's tendency to engage in experimentation with new ideas and support creative processes that, in turn, lead to new technological processes, services, and products.

Innovation in an organization can be measured through three components: leadership in research and development, new product lines, and changes in goods or services, whether radical or minor in nature (Mazzarol & Reboud, 2020, 54).

Proactivity

Proactivity is the pursuit of a leading advantage by anticipating future market wants and needs and capitalizing on emerging opportunities before competitors (Lumpkin & Dess, 1996). It is represented by an organization's willingness to anticipate and act upon market trends, adopting a forward-looking perspective (Teixeira et al., 2019, 72).

Proactivity involves how an organization reacts to various trends in its environment by introducing new methods and technologies (Bouhalleb and Messeghem, 2024). A proactive organization possesses the drive and foresight to seize new opportunities, making it a leader rather than a follower, and is the first to act in the pursuit of excellence to change the environment by introducing products or enhancing its competitiveness (Susanto et al., 2023, 305).

An organization's proactiveness can be determined by competitive actions, which indicate whether the organization typically initiates actions that competitors respond to, or whether it reacts to competitors, new technologies, which indicate whether the organization is the first to introduce new products, services, or management and operational techniques, or whether it lags behind, competitive posture, which reflects the extent to which the organization adopts a competitive stance that outperforms competitors (Mazzarol & Reboud, 2020, 55).

Risk-Taking

Risk-Taking refers to the degree to which organizations are willing to make significant resource commitments with a reasonable probability of failure and uncertain outcomes (Teixeira et al., 2019, 72). This refers to the willingness of managers within an organization to allocate risky resources, and there is a spectrum of risk ranging from relatively low risk to very high risk (Susanto et al., 2023, 306).

Lumpkin and Dess (1996) suggested that risk-taking entails taking bold actions that require significant levels of resources without any certainty about the potential rewards. Whether an organization engages in risk-taking can be determined by risk appetite, which represents the organization's tendency to take on high-risk projects that offer very high returns, and by environmental boldness, which refers to the large-scale bold actions an organization takes to achieve its goals (Mazzarol & Reboud, 2020, 55).

Study Hypotheses and Model

Based on the above, the researcher puts forward the following hypotheses:

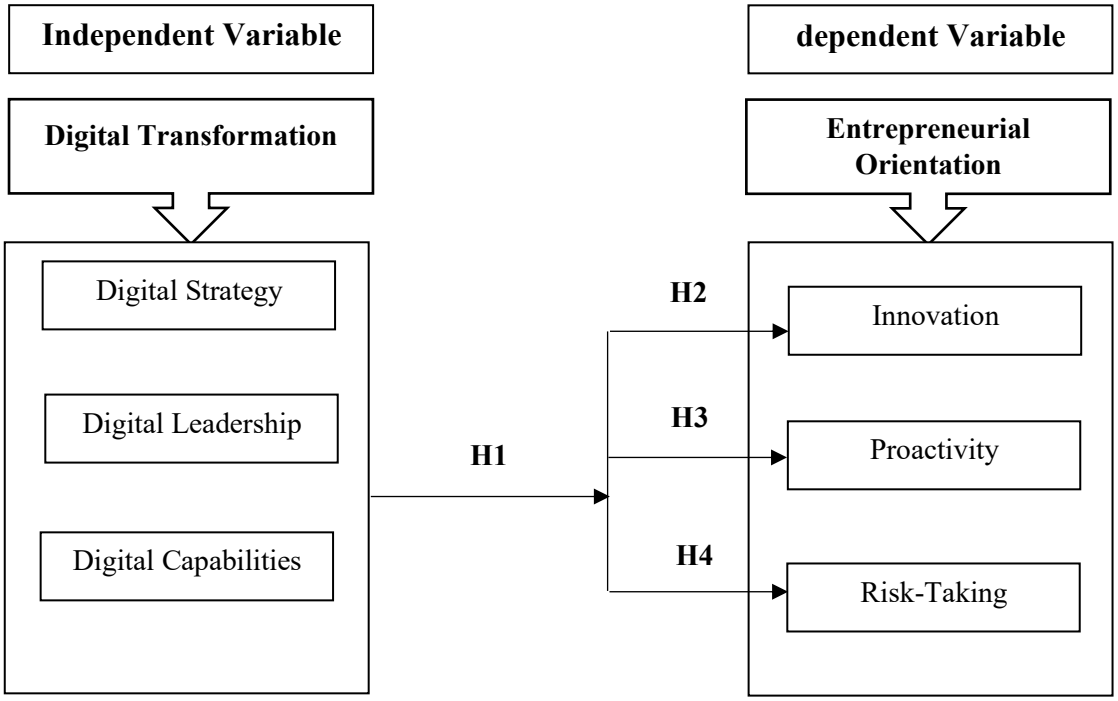
H1: There is a significant impact at ($\alpha \leq 0.05$) of Digital Transformation with its dimensions (Digital Strategy, Digital Leadership, and Digital Capabilities) on Entrepreneurial Orientation with Its dimensions (Innovation, Proactivity, and Risk-Taking) at Jordanian Pharmaceutical Manufacturing Companies.

H2: There is a significant impact at ($\alpha \leq 0.05$) of Digital Transformation on Innovation at Jordanian Pharmaceutical Manufacturing Companies.

H3: There is a significant impact at ($\alpha \leq 0.05$) of Digital Transformation on Proactivity at Jordanian Pharmaceutical Manufacturing Companies.

H4: There is a significant impact at ($\alpha \leq 0.05$) of Digital Transformation on Risk-Taking at Jordanian Pharmaceutical Manufacturing Companies.

Based on the previous hypotheses, the researchers designed the study model as shown in Figure 1.



Methodology

Study Sample

The study population included (153) managers working at the middle and top management levels in (24) Jordanian pharmaceutical manufacturing companies. A questionnaire was distributed to collect information using a comprehensive survey method, (121) valid questionnaires were retrieved for statistical analysis, representing (79%) of total questionnaires.

Study Tool

The study tool was a questionnaire developed by researchers to suit the nature of the study and its variables. The study tool (questionnaire) included the following sections:
Part One: Includes demographic variables for the study sample members, including (gender, age, educational qualifications, and years of experience).
Part Two: Includes items measuring (independent variable) digital transformation.
Part Three: Includes items measuring (dependent variable) entrepreneurial orientation.

Results

The reliability of the study tool (questionnaire) was confirmed by calculating the value of Cronbach's alpha coefficient for all dimensions and variables of "independent and dependent" study. According to Sekaran and Bougie (2016, 235), if the alpha results are greater than (70%), the result is statistically acceptable.

Table (1) indicates the Cronbach's alpha results for the dimensions of the study variables, where it was shown that the alpha values for the dimensions of digital transformation (the independent variable) ranged between (0.8630 & 0.908), and for the dimensions of leadership orientation, the alpha values ranged between (0.861 & 0.931). This

indicates that the scales used in the current study are characterized by a good degree of internal consistency between their components.

The table also displays the arithmetic means and standard deviations of study variables and their dimensions, it showed a high level of digital transformation and its dimensions, with a general arithmetic mean of (3.7446), the values of its dimensions ranged between (3.6860 & 3.8809), the digital strategy dimension ranked first with an arithmetic mean of (3.8809), followed in second place by the digital leadership dimension with an arithmetic mean of (3.7892), while the digital capabilities dimension ranked third with an arithmetic mean of (3.6860).

Moreover, the table shows a high level of entrepreneurial orientation and its dimensions with a general arithmetic mean of (3.9070), the values of its dimensions ranged between (3.7170 & 4.0383), the risk-taking dimension ranked first with an arithmetic mean of (4.0383), followed by proactive dimension in second place with an arithmetic mean of (4.0362), while innovation dimension ranked third with an arithmetic mean of (3.7170).

Table 1
Descriptive analysis Results for Study Items

Dimension	Items	Alpha	Mean	Std. Deviation
Digital Strategy	5	0.891	3.8809	0.517500
Digital Leadership	5	0.863	3.7892	0.570560
Digital Capabilities	5	0.908	3.6860	0.527830
Innovation	5	0.909	3.7170	0.625900
Proactivity	5	0.931	4.0362	0.553360
Risk-Taking	5	0.861	4.0383	0.433320

To test hypothesis H1, multiple regression coefficients were used, while simple regression was used to hypotheses H2, H3, and H4. Table (2) shows the results.

Table 2
Hypothesis Testing Results

	Model Summary		ANOVA				Coefficient				
	R	R^2	F	DF	Sig.	Statement	B	Std. error	β	T	Sig.
H1 The impact of Digital Transformation on Entrepreneurial Orientation	0.771	0.595	70.492	4	0.000	Digital Strategy	0.105	0.043	0.174	2.472	0.014
						Digital Leadership	0.115	0.052	0.233	2.992	0.003
						Digital Capabilities	0.235	0.045	0.355	5.226	0.000
	Model Summary		**ANOVA**				**Coefficient**				
	R	**R^2**	**F**	**DF**	**Sig.**	**Statement**	**B**	**Std. error**	**β**	**T**	**Sig.**
H2 The impact of Digital Transformation on Innovation	0.679	0.461	167.091	1	0.000	Innovation	0.710	0.055	0.679	12.926	0.000
	Model Summary		**ANOVA**				**Coefficient**				
	R	**R^2**	**F**	**DF**	**Sig.**	**Statement**	**B**	**Std. error**	**β**	**T**	**Sig.**
H3 The impact of Digital Transformation on Proactivity	0.566	0.320	91.884	1	0.000	Proactivity	0.377	0.039	0.566	9.586	0.000
	Model Summary		**ANOVA**				**Coefficient**				
	R	**R^2**	**F**	**DF**	**Sig.**	**Statement**	**B**	**Std. error**	**β**	**T**	**Sig.**
H4 The impact of Digital Transformation on Risk-Taking	0.646	0.417	139.510	1	0.000	Risk-Taking	0.590	0.050	0.646	11.811	0.000

H1: There is a significant impact at (α≤0.05) of Digital Transformation with its dimensions (Digital Strategy, Digital Leadership, and Digital Capabilities) on Entrepreneurial Orientation with Its dimensions (Innovation, Proactivity, and Risk-Taking) at Jordanian Pharmaceutical Manufacturing Companies.

Table (2) displays the results of the multiple regression test of the impact of digital transformation with its dimensions (digital strategy, digital leadership, and digital capabilities) on entrepreneurial orientation with its combined dimensions (innovation, proactivity, and risk-taking) at Jordanian pharmaceutical manufacturing companies, the correlation coefficient was (R=0.771), which means that there is a high degree of correlation between digital transformation with its dimensions and entrepreneurial orientation, the value of the coefficient of determination was (R^2=0.595), which means that digital transformation with its dimensions (digital strategy, digital leadership, and digital capabilities) explained (59.5%) of variance in entrepreneurial orientation at a degree of freedom (DF=4), the value of (F=70.492)

was at a significance level of (Sig.=0.000), which means that the regression is significant at (α ≤ 0.05).

The results of the coefficients table also showed that the beta value for the digital strategy dimension reached (β=0.174), and T value reached (2.472) at a significance level (Sig.=0.014), which is significant, while beta value for the digital leadership dimension reached (β=0.233), and T value reached (2.992) at a significance level (Sig.=0.003), which is significant, as for digital capabilities dimension, beta value reached (β=0.355), and T value reached (5.226) at a significance level (Sig.=0.000), which is significant, accordingly, all dimensions of digital transformation were significant, which requires accepting the hypothesis.

H2: There is a significant impact at (α≤0.05) of Digital Transformation on Innovation at Jordanian Pharmaceutical Manufacturing Companies.

Table (1) displays the results of the simple regression of the impact of digital transformation with its combined s (digital strategy, digital leadership, and digital capabilities) on innovation at Jordanian pharmaceutical manufacturing companies, the correlation coefficient was (R=0.679), which means that there is a high degree of correlation between digital transformation with its combined dimensions and innovation, the value of the coefficient of determination was (R^2=0.461), which means that digital transformation with its combined dimensions explained (46.1%) of the variance in innovation at a degree of freedom (DF=1), the value of (F=167.091) was at a significance level of (Sig.=0.000), which means that the regression is significant at (α ≤ 0.05), It is also evident from the coefficients table that the value of beta reached (β=0.679) and value of T reached (12.926) at a significance level of (Sig=0.000), which confirms the significance of the coefficient.

H3: There is a significant impact at (α≤0.05) of Digital Transformation on Proactivity at Jordanian Pharmaceutical Manufacturing Companies.

Table (1) displays the results of the simple regression of the impact of digital transformation with its combined s (digital strategy, digital leadership, and digital capabilities) on Proactivity at Jordanian pharmaceutical manufacturing companies, the correlation coefficient was (R=0.566), which means that there is a medium degree of correlation between digital transformation with its combined dimensions and Proactivity, the value of the coefficient of determination was (R^2=0.320), which means that digital transformation with its combined dimensions explained (32%) of the variance in Proactivity at a degree of freedom (DF=1), the value of (F=91.884) was at a significance level of (Sig.=0.000), which means that the regression is significant at (α ≤ 0.05), It is also evident from the coefficients table that the value of beta reached (β=0.556) and value of T reached (9.586) at a significance level of (Sig=0.000), which confirms the significance of the coefficient.

H3: There is a significant impact at (α≤0.05) of Digital Transformation on Proactivity at Jordanian Pharmaceutical Manufacturing Companies.

Table (1) displays the results of the simple regression of the impact of digital transformation with its combined s (digital strategy, digital leadership, and digital capabilities) on risk-taking at Jordanian pharmaceutical manufacturing companies, the correlation coefficient was (R=0.646), which means that there is a high degree of correlation between digital transformation with its combined dimensions and risk-taking, the value of the coefficient of determination was (R^2=0.417), which means that digital transformation with its

combined dimensions explained (41.7%) of the variance in risk-taking at a degree of freedom (DF=1), the value of (F=139.510) was at a significance level of (Sig.=0.000), which means that the regression is significant at ($\alpha \leq 0.05$), It is also evident from the coefficients table that the value of beta reached (β=0.646) and value of T reached (11.811) at a significance level of (Sig=0.000), which confirms the significance of the coefficient.

Discussion

The results indicated a high level of digital transformation and its dimensions in Jordanian pharmaceutical manufacturing companies. The digital strategy dimension ranked first, digital leadership ranked second, and digital capabilities ranked third, this indicates the extent of interest of Jordanian pharmaceutical manufacturing companies in developing a specific and comprehensive plan to adopt digital technology and integrate it into their operations, and to lead the digital transformation process and implement it in the work environment. It reflects the extent of these companies' keenness to facilitate improvement and development processes in a way that enhances their employees' adaptation to digital changes, which enhances operational efficiency and improves the products provided to customers, ensuring sound decision-making and achieving the goals of digital transformation.

The results indicated a high level of entrepreneurial orientation and its dimensions in Jordanian pharmaceutical manufacturing companies, with risk-taking ranked first, proactivity ranked second, and innovation ranked third, this indicates the interest of Jordanian pharmaceutical manufacturing companies in encouraging the employees to be bold in investing in new opportunities and taking risks in adopting new ideas, and presenting their new products before competitors to meet customer requirements, and the desire of these companies to satisfy their need for excellence, superiority and achieving a competitive advantage.

There is a significant impact of Digital Transformation with its dimensions (Digital Strategy, Digital Leadership, and Digital Capabilities) on Entrepreneurial Orientation with Its dimensions (Innovation, Proactivity, and Risk-Taking) at Jordanian Pharmaceutical Manufacturing Companies.

Recommendations

Based on the study's findings, the researchers propose the following recommendations:

1. Strengthen the digital strategy by adopting long-term plans that integrate digital transformation into the company's overall strategic objectives.
2. Continue to focus on and develop digital leadership by training management leaders on digital transformation tools and technologies, empowering them to lead change within the company.
3. Continue to focus on and invest in digital capabilities, such as advanced information systems and technological infrastructure, to support innovation and enhance market responsiveness.
4. Continue to support a culture of innovation within the company and adopt policies that encourage employees to think creatively and use digital tools to find innovative solutions.
5. Promote proactive decision-making by monitoring technological trends and future markets and preparing early for changes.

6. Promote risk-taking and entrepreneurship by providing a supportive environment that allows for experimentation and evaluation of new ideas without fear of failure.
7. Conduct future studies to explore the relationship between digital transformation and entrepreneurial orientation in other sectors, such as education, banking, and others.

Contribution

current study contributes to shedding light on the vital role of digital transformation, with its three dimensions (digital strategy, digital leadership, and digital capabilities), in enhancing the entrepreneurial orientation within Jordanian pharmaceutical manufacturing companies, represented by innovation, proactivity, and risk taking. This study is one of the few studies that links these two concepts in the Jordanian industrial context, thus contributing to bridging a knowledge gap in the management literature and providing a scientific basis for decision-makers in these companies to adopt effective digital strategies that enhance their competitiveness and leadership in a dynamic business environment. Its findings also provide practical recommendations that can contribute to raising the efficiency of entrepreneurial performance by investing in digital capabilities and developing digital leadership

References

Akkaya, B., & Tabak, A. (2023). *Two faces of digital transformation: Technological opportunities versus social threats*. Emerald Publishing Limited.

Al-Balawi, R., & Al-Balawi, K. (2023). A proposed vision for developing the performance of academic leaders at Tabuk University in light of digital leadership. *Journal of Educational and Human Studies, 15*(4), 721-764. https://dx.doi.org/10.21608/jehs.2023.322295

Al-Hadidi, S., Mukhlef, A., & Farhan, O. (2022). The Impact of Digital Transformation Technology on Improving Digital Maturity: A Field Study at Korek Telecom Company. *Journal of Business Economics for Applied Research, 3*(4), 137-155.

Al-Moaid, A., & Almarhdi, G. (2024). Developing dynamic capabilities for successful digital transformation projects: the mediating role of change management. *Journal of Innovation and Entrepreneurship*, *13*(1), 1-26.

Barba-Sánchez, V., Meseguer-Martínez, A., Gouveia-Rodrigues, R., & Raposo, M. L. (2024). Effects of digital transformation on firm performance: The role of IT capabilities and digital orientation. *Heliyon*, *10*(6), 1-10. https://doi.org/10.1016/j.heliyon.2024.e27725

Borowska, G. (2019). Digital leadership for digital transformation. *Współczesna Gospodarka*, *10*(3), 11-19.

Bouhalleb, A., & Messeghem, K. (2024). Exploring the impact of dynamic capabilities on entrepreneurial orientation in healthcare organizations: Findings from symmetric and asymmetric modeling. *Management international*, *28*(6), 7-20. https://doi.org/10.59876/a-gygn-yawn

Chatterjee, S., Chaudhuri, R., Vrontis, D., & Giovando, G. (2023). Digital workplace and organization performance: Moderating role of digital leadership capability. *Journal of Innovation & Knowledge*, *8*(1), 1-10. https://doi.org/10.1016/j.jik.2023.100334

Damayanti, F. P., & Mirfani, A. M. (2021, February). An analysis of digital leadership in the pandemic covid-19 ERA. In *4th International Conference on Research of Educational Administration and Management (ICREAM 2020)*, 156-159. Atlantis Press. https://doi.org/10.2991/assehr.k.210212.033

Fayolle, A. (2007). *Handbook of research in entrepreneurship education: A general perspective*. Edward Elgar Publishing.

Flink, C., Gross, L., & Pasmore, W. (2024). *Doing well and doing good: Human-centered digital transformation leadership* (Vol. 3). World Scientific.

Hernández-Linares, R., López-Fernández, M. C., García-Piqueres, G., Pina e Cunha, M., & Rego, A. (2024). How knowledge-based dynamic capabilities relate to firm performance: the mediating role of entrepreneurial orientation. *Review of Managerial Science*, *18*(10), 2781-2813.

Liebowitz, J. (2024). *Digital Transformation and Society*. World Scientific.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of management Review*, *21*(1), 135-172. https://doi.org/10.2307/258632

Ma, X. (2023). *Methodology for digital transformation: implementation path and data platform*. Springer Nature.

Mallisetty, M. S. (2023). *Digital transformation: advancements in business*. Book Saga Publications.

Mazzarol, T., & Reboud, S. (2020). *Entrepreneurship and innovation: Theory, practice and context* (4th ed.). Springer Natural.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management science*, *29*(7), 770-791.

Ratten, V. (2020). *Entrepreneurship as empowerment: Knowledge spillovers and entrepreneurial ecosystems*. Emerald Publishing Limited.

Rowles, D., & Brown, T. (2017). *Building digital culture: A practical guide to successful digital transformation*. Kogan Page Publishers.

Salih, A., Alsalhi, L., & Abou-Moghli, A. (2024). Entrepreneurial orientation and digital transformation as drivers of high organizational performance: Evidence from Iraqi private bank. *Uncertain Supply Chain Management*, *12*(1), 9-18. http://dx.doi.org/10.5267/j.uscm.2023.10.022

Satar, M. S., Alharthi, S., Alarifi, G., & Omeish, F. (2024). Does digital capabilities foster social innovation performance in social enterprises? mediation by firm-level entrepreneurial orientation. *Sustainability*, *16*(6), 1-22.

Sekaran, U., & Bougie, R. (2016). *Research methods for business* (7th ed.). John Wiley & Sons Ltd.

Strømmen-Bakhtiar, A. (2020). *Introduction to digital transformation: and its impact on society*. Informing Science Press.

Susanto, P., Handayani, F., Marna, E., Sari, P., Lasmini, S., Sofyan, R., & Ardi, H. (2023). *Proceedings of the Ninth Padang International Conference on Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2022)*. Atlantis Press.

Teixeira, M., Costa, D., & Lisboa, M. (2019). *Handbook of research on entrepreneurship, innovation, and internationalization*. IGI Global.

Teng, X., Wu, Z., & Yang, F. (2022). Research on the relationship between digital transformation and performance of SMEs. *Sustainability*, *14*(10), 3-17. https://doi.org/10.3390/su14106012

Upadrista, V. (2021). *Formula 4.0 for digital transformation: A business-driven digital transformation framework for industry 4.0*. Productivity Press.

Wang, X., Gu, Y., Ahmad, M., & Xue, C. (2022). The impact of digital capability on manufacturing company performance. *Sustainability*, *14*(10), 1-24. https://doi.org/10.3390/su14106214

Xu, J., Yu, Y., Zhang, M., & Zhang, J. Z. (2023). Impacts of digital transformation on eco-innovation and sustainable performance: Evidence from Chinese manufacturing companies. *Journal of Cleaner Production, 393*, 1-13.