

How Artificial Intelligence (AI) Affects Sustainable Economic Growth in the Jordanian Industrial Sector

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Abstract

Artificial Intelligence (AI) has become one of the game-changers that has the potential to improve an organisation's productivity, innovation, and future profitability. While the use of AI has spread through several sectors, there is still not much empirical studies on the impact of AI on sustainable economic growth in the emerging economies, and the organizational mechanisms that mediate this impact. Hence, this study aims to explore the influence of AI adoption on sustainable economic growth in the industrial sector in Jordan, and to explore the role of organizational learning as a mediating factor. The conceptual model was developed and tested empirically based on the three theories, namely, RBV, DC, and EGT with data gathered from 120 managers in the industrial organizations in Jordan. This study used a quantitative research design and analyzed the data with Partial Least Square Structural Equation Modeling (PLS-SEM). The results indicated that the use of artificial Intelligence has a positive impact on the learning and sustainable economic development of the organization. Additionally, organizational learning was found to have a significant positive effect on sustainable economic growth and partially mediate the relationship between the adoption of AI and economic performance. The findings underscore the need for embedding AI technologies into an organizational learning process to fully reap their productivity, innovation and competitiveness benefits. The study builds on a rapidly expanding body of research on AI for economic growth and offers managers and policy makers in emerging economies concrete ideas for accelerating digital transition and sustainable industrial development.

1. Introduction

AI is one of the most impactful technologies for the fourth Industrial Revolution. AI is an emerging technology that influences organisations' operations, industrial productivity and economic growth across the world, with machine learning, predictive analysis, intelligent automation and deep learning capabilities process large volumes of data, inform organisational decision-making with improved accuracy, optimise the use of resources and improve operational efficiency (Kumar et al., 2024; Huang & Rust, 2021). AI's capabilities are seen by many as a valuable asset for the organization and one that may be capable of forming sustainable competitive advantages and adding to the long-term economic growth of the organization. Many recent research studies have pointed to the impact of AI applications on business management practices, business leader behaviors and organizational decision-making practices to enable organizational innovation, responsiveness, and overall performance (Alnajdawi et al., 2025).

The growing adoption of AI has sparked growing research in the area of how AI can contribute to improving economic development. Today, more economists see AI as a general purpose technology that will likely lead to more innovation, structural change across industry and higher productivity (Aghion et al., 2019). AI streamlines processes and optimizes resource usage through automation, more precise predictions and data-driven decision making. AI is also perceived as being capable of fostering innovation, contributing to waste and inefficiency reduction, and increasing competitiveness among companies, thus being considered a facilitator for sustainable development (Vinuesa et al., 2020). Some

preliminary research indicates that AI ecosystems may help promote sustainable development through greater collaboration, technological advancements, and innovation-led economic growth (Qawasmeh et al., 2026).

The industrial sector is one of the biggest users of AI. The application of AI to manufacturing, logistics, predictive maintenance, quality control, and supply chain optimization provides companies with an opportunity to increase efficiency and reduce waste and operational costs. Thus, besides creating value for a company, AI is contributing to both national goals of promoting sustainable growth through modernizing industry and international goals of improving global economic performance through transforming economies. As such, countries around the world have included AI in their national strategic plans to enhance industrial competitiveness and transform their economy.

Several important research gaps exist regarding the use of AI and its impact on economic performance. In particular, most empirical studies have studied the relationship between AI and economic performance in developed country contexts, which are characterized as having well-developed technological infrastructure and mature innovation systems. In contrast, very little research has investigated the economic impacts of AI in emerging country contexts; that is, countries that vary significantly from each other in terms of institutional environments, levels of technological readiness, and firm-level capabilities.

Secondly, most of the past literature has focused on how adopting artificial intelligence relates to organizational performance and not much about how AI contributes to sustainable economic growth through mechanisms. While AI technologies can generate valuable ideas and operational efficiencies, their financial value depends very heavily on an organization's ability to convert technical capabilities into knowledge, innovation, and strategic actions. Therefore, it is necessary to study the organizational capabilities that permit conversion of AI investments into sustainable economic results.

Thirdly, emphatically, there are many pieces of evidence available today that demonstrate the impact of AI technology within industrial sectors in developing countries. Particularly in Jordan, where initiatives for modernization of the economy include digital transformation, technological innovation, and industrial development as key drivers of sustainable economic growth, understanding how AI contributes to economic development in Jordan's industrial sector represents a significant theoretical and practical opportunity for research.

To address these shortcomings, this research uses the resource-based view, Dynamic Capabilities Theory, and Endogenous Growth Theory. The resource-based view argues that companies will be able to achieve superior performance by effectively utilizing their valuable, rare, imitative and non-substitutable resources (Barney, 1991; Peteraf, 1993). In this context, AI is a strategic technological resource that can enhance productivity, innovation, and competitiveness. However, the resource-based view also suggests that resources alone do not lead to superior outcomes; rather, the value of resources depends on how well they are used in an organizational process.

Dynamic Capabilities Theory expands this view by demonstrating how organizations can use their capacity to combine and reorganize internal/external resources so they can be deployed in reaction to changes in technological or environmental context (Teece, 2007, 2021). Organizations with successful adaptive capabilities have a greater chance of converting AI generated insight into advantage and sustaining continuous improvement in performance. In addition to Dynamic Capabilities Theory, Endogenous Growth Theory states that long term economic growth will come about due to technological innovation and knowledge generation. Therefore, there is additional theory supporting the examination of AI as a driver of sustainable economic development (Aghion et al., 2019).

Based on these theories, the purpose of this study is to propose organizational learning as the most important process connecting AI adoption and sustainable economic growth. Organizational Learning refers to an organization's ability to obtain, distribute, interpret, and implement knowledge for improving decision making and performance (Argote, 2013; Cohen & Levinthal, 1990; March, 1991). Even though AI generates large amounts of analytic data that firms could potentially use to create innovation and increase productivity, the amount of knowledge that can be transformed into innovation, increased productivity and competitive strategy varies among firms. The degree to which firms possess strong learning capabilities allows them to capitalize on the knowledge produced by AI systems, adapt to technology and sustainably grow. Consequently, organizational learning has been framed as the strategic capability through which AI adoption leads to sustainable economic development.

The study examined the effect of adopting AI on sustainable economic growth in the Jordanian industrial sector, while analyzing organizational learning as a mediator variable between the two. Through incorporating Resource Based View Theory, Dynamic Capability Theory and Endogenous Growth Theory under one theoretical umbrella, the research contributed to the increasing body of literature related to AI and economic development. More specifically, the study extended current understanding in three ways: by conducting empirical research on an emerging market; by identifying the organizational processes by which AI affects sustainable growth; and by supplying policy makers and management personnel working in industries looking to use AI to increase their competitiveness, innovate, and ensure sustained long term economic development.

2. Literature Review

2.1 Artificial Intelligence Adoption

AI has been an exceptionally influential technology for transforming organizations, modernizing industry, and promoting economic development in the digital age. AI is defined as the ability of computer systems to do things that humans would normally use their "intelligence" or brain power to accomplish, which includes learning, reasoning, recognizing patterns, predicting future events, and making decisions (Huang & Rust, 2021). The rapid advances made in machine learning, deep learning, natural language processing, computer vision, and predictive analytics have greatly enhanced the potential of AI systems to quickly process and analyze very large amounts of both structured and unstructured data. Therefore,

AI has advanced from being simply a technological tool used to support specific functions in an organization to being a strategic organizational capability that can be used to drive innovation, improve operational efficiencies, and enhance a company's long-term competitiveness.

As AI continues to gain traction across multiple industrial sectors, researchers have begun to view it as a General Purpose Technology (GPT), similar to other technological revolutions like electricity, IT, and the Internet (Aghion et al., 2019). Like these prior technological revolutions, GPTs are expected to create broad-based impacts on the economy and business operations. Traditional Information Systems (IS) have historically supported organizations with the primary function of processing and managing information, whereas AI generates insights, identifies trends and patterns, automates decisions, and continually improves its performance using self-optimizing learning algorithms. All of these capabilities allow companies to produce higher-quality forecasts, allocate resources more efficiently, minimize operating expenses, make better strategic decisions, etc. In this light, AI is becoming increasingly recognized as a key enabler of digital transformation initiatives and Industry 4.0.

In addition to numerous areas within an organization using AI-based technologies, there are many different ways that AI is now applied at the sector level. Companies apply AI to various activities, including predictive maintenance, smart manufacturing, quality assurance, inventory control, forecasted demand generation, and optimizing their supply chain. Each of these uses of AI enhances how well an organization operates by decreasing downtime and waste while improving productivity and flexibility. Moreover, AI allows companies to monitor and take action on real-time issues related to external factors influencing their environment and/or internal market conditions. Since companies competing in industrial markets require high levels of efficiency, innovation, and adaptation to achieve sustainable success, AI provides organizations with some valuable tools for achieving these goals.

From the standpoint of strategic management, the RBV represents a suitable conceptual framework for developing an appreciation for the value of adopting artificial intelligence technology. The RBV posits that organizations will achieve superior performance when they have access to valuable, rare, inimitable, and non-substitutable resources relative to those available to their competitors. Because AI technologies afford organizations with unique analytical capabilities, enhanced decision support mechanisms, and improved data-driven insight into how operations can improve organizational performance, they are considered strategic resources. However, the RBV indicates that having access to technological resources does not automatically ensure that a firm will obtain competitive advantages. Thus, an organization needs to develop the necessary capabilities to combine technological resources with operational and strategic processes.

Although past research reports generally favorable results regarding the impact of AI on organizational performance, the research also indicates that firms vary significantly in their ability to benefit from implementing AI. For example, while some firms report significant improvement in terms of innovation, productivity and competitiveness, other firms appear to fail to realize the anticipated returns from their investment in AI. As such, these variations suggest that simply adopting AI technologies alone is likely to

be inadequate to produce long-term improvements in organizational performance. Instead, organizations must establish complementary capabilities to successfully translate knowledge generated by AI into effective application within operational and strategic contexts. Accordingly, researchers increasingly are investigating the various organizational mechanisms through which AI generates value. Specifically, among these mechanisms, organizational learning has emerged as a crucial capability to determine if organizations can convert AI-generated insights into sustained performance and growth outcomes.

2.2 Organizational Learning

Organizational Learning is among the most important strategic capabilities available to companies to enable them to adapt, to innovate, and to achieve high levels of performance in an increasingly rapid pace of change in today's business environment. Organizational Learning is defined as the process of how organizations acquire, distribute, interpret, and apply knowledge to increase the quality of decision making and the overall effectiveness of the organization (Argote, 2013; March, 1991). Individual learning does not involve developing knowledge collectively at the level of the organization. Instead, knowledge developed individually is embedded in organizational routines, systems, and practices. As organizations continue to learn, they will be able to create a competitive advantage in the future based upon their ability to respond to environmental changes and capitalize on emerging opportunities.

In the digital age, the importance of organizational learning has grown significantly due to the vast amounts of data being created and used with technological advancements. Cohen & Levinthal (1990) introduced the concept of absorptive capacity. Absorptive capacity emphasizes that organizations have different abilities to recognize, assimilate, and take action upon new knowledge. Organizations that have a greater degree of absorptive capacity can take external information and convert it into valuable organizational knowledge. The perspective implies that while technology can provide many benefits, the extent to which those benefits occur depends on an organization's ability to learn from and use the information created by those technologies.

Finally, Dynamic Capabilities Theory supports the strategic importance of organizational learning. Teece et al. (1997) and Teece (2007; 2021) argue that organizations must continually incorporate, expand, and reorganize their internal and external competence to deal with the rapidly changing nature of the environment. Organizational learning is a key dynamic capability because it allows organizations to acquire new knowledge, adjust current practice, and develop innovative solutions to problems related to technological and market changes. In general, organizations that are focused on learning will have greater capabilities in terms of remaining competitive and sustaining performance over time compared to organizations that focus exclusively on using existing resources and routines. Organizational Learning as a Determinant for Innovation, Operational Excellence, and Performance

Studies have shown time and again that organizational learning has been found to be a major predictor of innovation, operational excellence, and overall organizational performance. As argued in Zahra and George (2002), learning capabilities enhance an organization's ability to innovate through the creation of knowledge sharing and application; while, according to Argote (2013), the continuous improvement of

process and decision making occurs when organizations create and retain knowledge. Nevertheless, there are now several studies that suggest how effective an organization learns is dependent upon the quality of its knowledge-sharing mechanism, leadership support, and organizational culture. An organization may have access to high-quality information, yet fail to realize meaningful results due to failure to effectively disseminate and apply this knowledge within the organization (Raisch & Krakowski, 2021).

2.3 Sustainable Economic Growth

Sustainable economic growth, or achieving a continued increase in an economy's total production output over time, is now considered one of the most critical strategic objectives for all organizations and government entities involved in economic policy who desire to create lasting prosperity. Traditional measures of economic growth focus almost exclusively on increased levels of output and/or improved productivity. In contrast, sustainable economic growth requires that an organization be able to continuously create economic value through innovative processes, efficient operations, competitive products/services, and socially-responsible use of resources. The effectiveness of sustainable growth in today's knowledge-based economies will depend significantly upon the organization's ability to successfully integrate technological innovations, human-capital development initiatives, and internal organizational capabilities to support both long-term adaptability and resilience.

The theoretical basis for sustainable economic growth is grounded primarily in Endogenous Growth Theory. This theory posits that economic growth occurs due to investment in knowledge, innovation, technology, and human capital rather than as a result of exogenous influences (Romer, 1990). From the endogenous perspective, the advancements created from technological progress allow for higher productivity and provide new avenues for economic development by creating opportunities for knowledge creation and transfer. Aghion et al. (2019) point out that emerging technologies, such as Artificial Intelligence, play significant roles in current economic growth. They suggest that these emerging technologies enhance an organization's innovation potential, stimulate greater productivity gains, and facilitate industrial transformation.

In recent years, it has been found that digital technologies are contributing to sustainable economic development. AI-powered systems boost productivity by optimizing processes, enabling intelligent automation, and providing data-driven insights for decision-making. Moreover, technological innovation also helps organizations to optimize the use of resources, minimize operational waste, and facilitate a more sustainable approach to their business (Vinuesa et al., 2020) to better align their economic goals with wider sustainability goals. These advantages are especially relevant in sectors that have a significant relationship with productivity gains and the efficient utilization of resources, affecting company performance and competitiveness.

Sustainable economic development does not occur simply through investment in technology. organizations need to develop capabilities that will allow them to convert technology into innovations, operational improvements, and strategic advantages. In order for the conversion of technology to be

successful, there needs to be good knowledge management practices, learning mechanisms, and adaptive abilities. The use of technology without these capabilities can result in minimal or no economic returns. This has led researchers to view sustainable development as an outcome of the interactions among a firm's technology, its organizational capabilities, and the innovation process. Rather than viewing sustainable development as an outcome of technology alone (Teece, 2021).

The Jordanian industry is facing increasing pressures from globalization, technological disruption, and modernizing economies. Thus, developing sustainable economic growth is crucial. With the increase in globalization, many organizations are seeking ways to increase their productivity and competitive position. Artificial Intelligence (AI) Adoption and Organizational Learning have become two key elements of supporting innovation-led growth and long-term economic sustainability. Therefore, studying how these concepts contribute to sustainable economic development will provide valuable contributions to both theory and practice.

2.4 Artificial Intelligence Adoption and Organizational Learning

AI technology is considered a valuable resource for organizations from the Resource-Based View. It provides a firm with a set of knowledge or analytical capabilities. From this view, a firm does not realize the full value of its AI technology unless it possesses a set of learning mechanisms to convert data produced by the use of AI technology into action-based knowledge.

The Dynamic Capabilities Theory also supports the positive relationship between the adoption of AI and organizational learning. Firms competing in dynamic environments must be able to continue acquiring, integrating, and reconfiguring knowledge to maintain competitiveness. AI technologies have enhanced these capabilities. They produce relevant time-sensitive information, identify emergent patterns in large amounts of data, and aid in continued knowledge acquisition. These enhancements allow firms to adapt to both rapid technological changes and the increased complexity associated with environmental uncertainty. As such, they are better positioned to learn and grow over time.

In summary, while AI is recognized as being able to assist firms in improving their operations and enhancing their analytical capabilities, the greater benefit of using AI may be that it assists firms in generating new knowledge. The success of AI technology as a source of new knowledge will depend upon whether firms have developed the appropriate processes to translate data provided by the technology into actionable knowledge. To date, there has been little research conducted on how firms successfully implement AI technology. In particular, there is limited research available that examines how firms develop processes to use the knowledge generated by AI technology to make improvements to their business models.

The empirical evidence supporting this theory exists as well. For example, Davenport et al. (2020) explain that adopting Artificial Intelligence enhances organizational learning through improved access to information and knowledge sharing processes. In addition, Raisch & Krakowski (2021) have identified

that using artificial intelligence to assist with decision-making encourages experimentation, learning, and organizational adaptation. Nonetheless, there are some empirical studies indicating that the relationship between AI and organizational learning does not exist as a linear cause-and-effect model. In other words, even if an organization invests in an artificial intelligence system, it will not be able to realize the full potential of its investment in learning unless it can successfully transition to a technological culture among employees, create conditions conducive to a strong knowledge-sharing culture, or develop effective support for employee learning. In fact, research indicates that while AI provides the opportunity for organizations to learn from investing in new technology, ultimately the degree to which organizational learning occurs will depend on how effectively the organization incorporates technology into its knowledge management process.

Although the literature has noted that there are significant differences based on the context in which AI was adopted, most of the contemporary literature agrees that utilizing AI in an organization increases the learning capacity of that organization. More specifically, the use of AI increases the learning capabilities of an organization by increasing the amount of knowledge acquired, the speed at which an organization can process information, and increasing the level of adaptability within an organization.

H1: Artificial intelligence adoption positively influences organizational learning.

2.5 Organizational Learning and Sustainable Economic Growth

Organizational learning is widely regarded as a key factor in driving both the competitive advantage of an organization and its long-term success. As we continue to see an increasing number of companies operating within rapidly changing and increasingly complex and knowledge-based environments, it is critical for them to continually be acquiring, creating, sharing, and applying knowledge. Therefore, the ability of an organization to acquire and use knowledge is typically viewed as a strategic competency that can allow a firm to convert information and experience into positive results that support long-term economic viability (March, 1991; Argote, 2013).

Knowledge creation and innovation have also been identified through Endogenous Growth Theory as two primary drivers of sustainable economic growth. This is due to their ability to increase productivity, optimize the use of available resources, and provide new avenues for creating value (Aghion et al., 2019; Romer, 1990). The process of organizational learning directly impacts the creation of this type of knowledge by providing organizations with the means to accumulate and use knowledge in ways that support ongoing innovation and continuous improvement. Organizations that can learn from the experiences of their employees, from their external environment, and from technological advancements are generally better equipped to find growth opportunities, improve operational efficiencies, and react to changing environmental circumstances.

The Dynamic Capabilities Theory further illustrates the relationship between organizational learning and sustainable economic growth. The learning capabilities of an organization will ultimately determine how

well the organization is able to modify its assets and skills in response to rapid technological advancements and changes in markets (Teece, 2021; Teece, 2007). Organizational learning allows organizations to become more flexible, innovative, and responsive to the organization's strategy. These three factors will help drive the long-term competitive position and sustainable economic performance of an organization. Conversely, organizations that do not establish learning capabilities will often struggle to adjust to changes in the external environment.

Although research has found different variables that influence how well an organization learns and uses its abilities (e.g., leadership, organizational culture), the majority of research supports the idea that a continuous learning process allows for greater levels of innovation, productivity, adaptation, and ultimately increases economic output. In essence, this is a key component to developing sustainable economic development; thus, it can be argued that those companies that continually develop new methods and strategies will have more success over time than those that do not.

2.6 Organizational Learning Enhances Innovation and Productivity

Learning is seen by Argote (2013) as increasing the efficiency of a business due to an improvement in both its operational and strategic efficiencies. The improvement comes from the development of a firm's knowledge base, which leads to an increase in its operational performance. Additionally, according to him, the increased flexibility to adjust to new and constantly changing environments increases a firm's adaptability. Consequently, the improved adaptability and efficiency will directly increase a firm's innovative capabilities. Therefore, by continuously learning and adjusting to the changing technological and environmental surroundings, a company has the opportunity for sustainable economic growth through the use of knowledge. Zahra & George (2002) further added that companies that have high levels of learning and absorption are at the highest risk of transforming knowledge into innovation and therefore creating competitive advantages.

H2: Organizational learning positively influences sustainable economic growth.

2.7 Artificial Intelligence Adoption and Sustainable Economic Growth

The increasing recognition of artificial intelligence (AI) as an economic engine for growth stems from its capability to drive productivity, promote innovation, and maximize organizational efficiencies. With AI being a general-purpose technology, it enhances economic performance through transformational changes in how organizations develop value, distribute resources, and capitalize upon opportunities presented by the marketplace (Aghion et al. 2019). Organizations have been able to transform their operations through the use of intelligent automation, predictive analytics, and data-driven decision-making with AI. These enhancements have contributed to improved competitiveness and overall economic performance of organizations.

AI represents a valuable resource for organizations based on the resource-based view model. This view model states that organizations will be able to obtain sustained competitive advantages if they can successfully integrate this type of valuable resource into their internal business practices (Barney 1991; Peteraf 1993). AI provides organizations with advanced analytic capabilities, which allow them to innovate, increase flexibility in their operations, and better use available resources. Additionally, endogenous growth theory argues that technological innovations and knowledge creation represent two primary factors associated with long-term economic growth (Romer 1990). The role of AI in creating innovative solutions and maximizing productivity will contribute to both individual organizational success and broader national economic development.

There exists significant empirical evidence supporting the positive association between the adoption of AI and overall economic performance. Brynjolfsson et al. (2021) state that the increased productivity resulting from AI will stem from enhanced decision-making and operationally efficient processes. Also, Kumar et al. (2024) found that organizations utilizing AI will experience greater levels of innovation and achieve higher levels of competitive performance than organizations relying on traditional operational strategies. Finally, AI technologies support sustainability goals through process optimizations that lead to reduced waste and lower energy consumption, ultimately contributing to sustainable economic growth (Vinuesa et al. 2020).

Although there is evidence from earlier research that shows a great deal of variation in the positive financial impact of adopting an Artificial Intelligence (AI) system, it appears that this variation can be influenced by how well an organization is prepared to implement an AI system; the quality of the technology implemented; and the ability of managers within an organization to make decisions related to implementing and using the technology. Organizations are also able to realize varying levels of outcome as a result of their ability to successfully implement an AI system. As a result, while the overall body of literature indicates that the use of an AI system will have a positive influence on the level of productivity, innovation, competition, and sustainability in an economy, each of which contributes to sustainable long-term economic development.

H3: Artificial intelligence adoption positively influences sustainable economic growth.

2.8 The Mediating Role of Organizational Learning

Although Artificial Intelligence (AI) is considered by many to be a strategically important technology for enhancing an organization's innovation, productivity, and overall performance, there is evidence to suggest that an organization does not realize the full potential of its investment in AI. In other words, while many organizations have invested in AI technology, they often experience different degrees of success in creating sustainable economic results. The variability of results experienced by organizations using AI technology would seem to suggest that the value created by the use of AI depends upon the existence of certain organizational capabilities or competencies that can be used to effectively use the knowledge generated by AI. One such capability that has been identified as being critical to the link between AI adoption and sustainable economic growth is organizational learning.

Many researchers, including Barney (1991) and Peteraf (1993), have argued using the Resource-Based View perspective that in order to gain a competitive advantage through the use of a valuable resource, an organization must possess complementary capabilities or competencies that will allow it to effectively deploy the valuable resource. For example, AI technology generates sophisticated analytical capabilities and offers an organization access to significant amounts of strategic information. However, in order for an organization to create economic value from the use of AI technology, it must first acquire, interpret, disseminate, and then apply the insights generated by the technology. An organization's ability to learn and grow allows it to transform technological resources into usable knowledge that will improve both its decision-making and operational effectiveness.

Additionally, Teece (2007, 2021) has emphasized that, according to the dynamic capabilities theory, organizations must continually be able to integrate and reconfigure knowledge to adapt to changes in their environment. As mentioned earlier, AI technology produces large quantities of data; however, sustainable financial returns from an organization's investment in AI technology depend upon its having the capacity for learning and adapting. The learning processes that occur within an organization allow it to convert the intelligence produced by AI into innovation, productivity improvements, and sustained competitive advantages.

Finally, Endogenous Growth Theory (Romer, 1990; Aghion et al., 2019) identifies knowledge generation and innovation as two essential factors for achieving long-term economic growth. An organization's ability to learn and develop new knowledge based on the information produced by AI technology creates additional productive knowledge that leads to increased innovation, improved resource usage, and enhanced long-term sustainability. Research studies also demonstrate empirically that organizations tend to benefit most significantly from their technological investments when they have strong learning and absorptive abilities (Cohen & Levinthal, 1990; Zahra & George, 2002; Raisch & Krakowski, 2021). Thus, organizational learning should function as one of the primary mechanisms through which AI technology will contribute to long-term economic growth.

H4: Organizational learning mediates the relationship between artificial intelligence adoption and sustainable economic growth.

3. Methodology

As an exploratory study that uses a quantitative methodology, this research used a cross-sectional research design to evaluate the impact of Artificial Intelligence adoption upon sustainable economic development. Furthermore, this study will explore whether organizational learning mediates the relationship between AI adoption and sustainable economic development within the Industrial Sector of Jordan. Using a quantitative methodology allows researchers to test theoretically developed relationships empirically among latent constructs. It also allows for statistically based generalizations of results across different organizations. As such, a deductive research strategy will be used. That is,

specific hypotheses derived from the RBV, Dynamic Capability Theory, and Endogenous Growth Theory will be empirically evaluated using survey data provided by industrial organizations.

The proposed conceptual model consists of three variables: One independent variable (Artificial Intelligence Adoption), one mediating variable (Organizational Learning), and one dependent variable (Sustainable Economic Development). Due to the fact that there are multiple relationships in the proposed model, as well as the fact that a mediation effect exists, Partial Least Squares Structural Equation Modeling (PLS-SEM) has been chosen as the preferred methodological technique to analyze the data.

Managers working within industrial organizations located in Jordan comprise the target population. In selecting managers, their position provides them with first-hand information concerning the adoption of technology, learning strategies, and overall business performance. Due to their responsibility to implement AI-related programs, managers have insight into how these technologies can influence their organization's growth and development.

Purposive sampling was applied to select managers who have experience and familiarity with AI-related organizational issues. Structured questionnaires were distributed to selected industrial firms where managers were asked questions related to AI and its associated organizational issues. Responses were received from 120 managers, and after eliminating incomplete surveys, 120 valid responses remained for use in the analysis.

Hair et al. (2022) noted that PLS-SEM is particularly suited for investigations with relatively small sample sizes. It is also applicable for studies employing complex predictive models. Therefore, the sample size is acceptable for both testing structural relationships and evaluating mediation effects for the proposed model consisting of one independent variable, one mediating variable, and one dependent variable.

The survey instrument contained four sections. The first section asked for general demographic questions like gender, age, education level, job title, and number of years working. The other sections contained measures on the study constructs based on pre-tested instruments taken from the existing literature. AI use in the organization was captured by measuring the degree of AI's influence on decisions, as well as its involvement in process automation, predictive analysis, and day-to-day operations. Organizational Learning was measured by assessing the respondent's perceptions of their organization's ability to acquire knowledge, share knowledge within the organization, integrate knowledge into processes and products, and apply knowledge.

Economic Sustainability was measured by how productive they believed their organization had become since implementing AI, whether they felt innovative since AI was introduced, if they believe AI has improved operational efficiencies at their organizations, how competitive they feel they are now compared to before introducing AI, and how much they expect their organization will grow long-term due to the implementation of AI. Each measure item was assessed on a 5-point Likert Scale ranging from "I

strongly disagree" = 1 to "I strongly agree" = 5. Academic peers and industry professionals reviewed the survey to assess its face validity and clarity of wording.

Survey administration occurred over three months. Before distributing the survey to potential participants, respondents were advised as to the objective of this research effort and told that all participant responses would be kept completely anonymous and confidential. Participation in this survey was strictly voluntary, and participants were told that the only reason for collecting this information was for the purposes of conducting research.

Common method variance (CMV) was minimized in several ways. Respondents were informed that there is no correct answer when responding to these items and that honesty was encouraged in providing responses. CMV can also be reduced by placing items on the survey in an order that reduces confusion and increases clarity regarding each question. This was done to minimize response ambiguity. The collected data were subjected to statistical analyses using SmartPLS version 4 software. Structural equation modeling (SEM) via partial least squares (PLS) was selected as it is suited for predictive research efforts (i.e., identifying causal relationships between variables) and analyzing mediated effects in research studies with latent constructs measured through multiple indicators (Hair et al., 2022). Analysis was performed in two phases: first, assessing the measurement model, and second, assessing the structural model.

Assessment of the measurement model involved examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Indicator reliability was determined through examination of factor loadings of individual indicators. Recommended minimum threshold for indicator reliability is .7. Internal consistency reliability was assessed using both Cronbach's alpha and composite reliability (CR). Both should exceed .7. Convergent validity was determined through examination of average variance extracted (AVE) values. For AVE values to indicate sufficient convergent validity, they must be > .5. Discriminant validity was examined through heterotrait-monotrait ratio (HTMT) values. Suggested HTMT values for determining discriminant validity are < .85. Multicollinearity was assessed through variance inflation factor (VIF) values. All VIF values less than 10 are generally regarded as non-collinear.

Following assessment of the measurement model, assessment of the structural model was conducted through examination of structural paths, R-squared values, F-squared values, Q-squared values, and bootstrap results. Bootstrapped confidence intervals for direct and indirect effects were generated by running 5,000 resamples of the dataset. Mediated effects were examined according to the recommendations made by Zhao et al. (2010) and Hair et al. (2022).

Ethical guidelines were followed during the conduct of this study. Participation was optional, respondents were assured of anonymity and confidentiality, and no personally identifiable information (PII) was collected from participants. The data collected in this study were used solely for academic purposes and stored securely throughout the entire research process. Participants were informed about the purpose of the study and provided informed consent before participating in this study.

4. Results

A total of 120 valid responses were collected from Jordanian managers who work in an industrial organization. Respondents belonged to a variety of managerial positions; they also had varied amounts of professional experience, which provided a very complete picture of how industrial companies adopt AI, learn about their organizations, and grow sustainably economically. Managers' demographics show that there is a significant number of experienced managers. In fact, 47.5% of the sample have at least ten years of professional experience, while 51.7% of them hold post-graduation degrees. Therefore, this profile supports the validity of the results because these respondents should be well-equipped to make informed decisions on both technological innovation (e.g., adopting AI) and strategic decisions related to it.

Table 1
Respondent Profile (N = 120)

Variable	Category	Frequency	Percentage (%)
Gender	Male	84	70
	Female	36	30
Age	Below 30 years	18	15
	30–39 years	42	35
	40–49 years	39	32.5
	50 years and above	21	17.5
Education	Bachelor's Degree	58	48.3
	Master's Degree	47	39.2
	PhD Degree	15	12.5
Experience	Less than 5 years	19	15.8
	5–10 years	44	36.7
	More than 10 years	57	47.5

Internal consistency reliabilities were analyzed for all the constructs in the study to assess their internal consistency reliability as suggested by Hair et al. (2022). Indicator reliabilities were also evaluated to provide an assessment of how well each measure or item represented its underlying construct.

Table 2
Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Artificial Intelligence Adoption	0.889	0.915	0.683
Organizational Learning	0.901	0.926	0.714
Sustainable Economic Growth	0.887	0.918	0.691

All Cronbach's alpha values for the dimensions were between 0.887 and 0.901, and composite reliabilities between 0.915 and 0.926, which is above the minimum required 0.70 (Hair et al., 2022). Additionally, average variance extracted values were between 0.683 and 0.714, which is higher than the minimum requirement of 0.5. Therefore, the high internal consistency reliability as well as convergent validity was established.

Table 3
Factor Loadings

Construct	Item	Loading
Artificial Intelligence Adoption	AI1	0.812
	AI2	0.845
	AI3	0.827
	AI4	0.874
Organizational Learning	OL1	0.853
	OL2	0.866
	OL3	0.841
	OL4	0.828
Sustainable Economic Growth	SEG1	0.817
	SEG2	0.863
	SEG3	0.844
	SEG4	0.826

Indicator reliabilities were all above the suggested value of .7 (.7-.8) for all items. These values are in good agreement with values reported by Hair et al. (2022), which suggest acceptable levels of test-retest reliability and support the idea that each measure is representative of its underlying construct.

Table 4
Discriminant Validity (HTMT)

Construct	AI	OL	SEG
Artificial Intelligence Adoption	—		
Organizational Learning	0.721	—	
Sustainable Economic Growth	0.693	0.744	—

Discriminant Validity for Heterotrait-Monotrait Ratios was assessed by examining the Heterotrait-Monotrait Ratio (HTMT) statistics. All HTMT values for all Hetero-Trait Monotrait ratios for all variables were less than .85, which is the recommended threshold; therefore, they confirmed adequate discriminant validity and provided empirical evidence for distinguishing among each construct (Henseler et al., 2015).

Following the assessment of the measurement model as valid, the structural model was then assessed with three types of coefficients. Coefficients of Determination (R^2) measure the extent to which a model explains a dependent variable. Predictive Relevance (Q^2) assesses how well a model predicts a dependent variable. Path Coefficients indicate the strength and directionality of relationships in a Structural Equation Model (Hair et al., 2022).

Table 5
Coefficient of Determination and Predictive Relevance

Endogenous Construct	R^2	Q^2
Organizational Learning	0.375	0.242
Sustainable Economic Growth	0.581	0.351

Artificial intelligence adoption was responsible for explaining 37.5 percent of the variance in organizational learning. Additionally, artificial intelligence adoption and organizational learning together accounted for approximately 58.1 percent of the variation in sustainable economic growth. This represents a significant amount of explanatory ability in the model. Finally, both Q^2 values of 0.242 and 0.351 are greater than 0, the model has satisfactory predictive relevance; thus, the model can be used to make predictions.

In addition to testing the proposed hypothesis using the bootstrapping method, 5,000 bootstrap samples were generated as suggested by Hair et al. (2022) as an appropriate number of samples for determining structural relationships in PLS-SEM models.

Table 6
Structural Model Results

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	AI Adoption → Organizational Learning	0.612	8.954	< 0.001	Supported
H2	Organizational Learning → Sustainable Economic Growth	0.487	6.873	< 0.001	Supported
H3	AI Adoption → Sustainable Economic Growth	0.321	4.915	< 0.001	Supported

The results indicate a very strong and statistically significant correlation in the direction of Artificial Intelligence Adoption (AIAD) and Organization Learning (OL) as defined by $\beta = .612$, $t = 8.954$, $p < .001$. Therefore, H1 is supported. It can be concluded that the adoption of AI technology supports an organization's ability to acquire knowledge, share knowledge, and increase learning. Similarly, OL has a statistically significant and strongly positive impact on Sustainable Economic Growth (SEG) ($\beta = .487$, $t = 6.873$, $p < .001$); therefore, H2 is supported. Organizations with higher levels of learning will experience improved productivity, increased innovation, and ultimately have greater long-term economic success. Furthermore, there is a statistically significant and strongly positive direct impact of AIAD on SEG ($\beta = .321$, $t = 4.915$, $p < .001$), supporting H3. The evidence supports the conclusion that the use of AI technologies contributes directly to an organization's competitive position through improvements in operational efficiencies and ultimately creates sustainable economic returns.

Table 7
Mediation Analysis

Relationship	Indirect Effect	t-value	p-value	Mediation Type
AI Adoption → Organizational Learning → Sustainable Economic Growth	0.298	5.742	< 0.001	Partial Mediation

The Indirect Effect of AI Adoption on organizational learning, which affects sustainable economic growth, was found to be statistically significant ($t = 5.742$; $\beta = .298$; $p < .001$). Hence, H4 has been confirmed. These results show that there is a Partial Mediation as AI is shown to influence sustainable economic growth in two ways: directly and indirectly through increasing an organization's ability for learning.

Table 8
Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	Artificial intelligence adoption positively influences organizational learning.	Supported
H2	Organizational learning positively influences sustainable economic growth.	Supported
H3	Artificial intelligence adoption positively influences sustainable economic growth.	Supported
H4	Organizational learning mediates the relationship between artificial intelligence adoption and sustainable economic growth.	Supported

The overall finding provides very good empirical evidence supporting the suggested model. In addition to showing a direct positive relationship between the adoption of Artificial Intelligence and sustainable economic growth, this study shows that organizational learning is enhanced by AI adoption and therefore, will enhance the capability of an organization to innovate and produce efficiently with resultant increased economic sustainability. Therefore, the significance of having capable learning organizations as a means of deriving maximum economic benefit from AI investments was found to be strategically important within the Jordanian industrial context.

5. Discussion

The objective of the present research study was to evaluate the influence of AI technology on sustainable economic development. In addition, it was to assess whether or not an organization's ability to learn from its experiences plays a mediating role in the influence of AI technology on sustainable economic development within the Jordanian manufacturing sector. The data collected in this study provided substantial evidence to support the proposed conceptual model and showed that there exists a direct and indirect link between AI technology adoption and sustainable economic development through the experience-based learning of an organization. The findings of the current study expand upon the prior literature related to the strategic use of AI technology and emphasize the need for organizations to have sufficient learning capabilities to transform their investment in new technologies into sustained long-term financial returns (Qawasmeh et al., 2026).

There existed a significant and positive correlation between the adoption of AI technology and organizational learning, as indicated by H1. These findings suggest that firms that adopt AI technologies will tend to create greater knowledge acquisition, greater knowledge sharing, and greater learning capabilities than those that do not. Firm managers and employees now have access to much more relevant information and advanced analytical insights from AI, enabling them to make more informed decisions about the way that they run the firm. Furthermore, using AI enables firms to continually improve their operations and processes.

The results are consistent with dynamic capabilities theories. As Teece (2007, 2021) wrote, companies must continually collect, integrate and reorganize knowledge in order to survive in a rapidly changing environment. AI technology helps organisation collect actionable insights for adaptation and learning. The results of this study also aligned with previously published studies showing positive correlations between AI technology adoption and organizational knowledge generation/development and organizational learning (Raisch & Krakowski, 2021; Davenport et al., 2020). Therefore, AI must be considered to be a technological tool as well as a strategy to improve knowledge generation/learning in an organization.

The findings also showed a markedly positive correlation between organization learning and sustainable economic growth which supported H2. The results suggest that the more learning organizations are, the more likely they are to achieve better productivity, competitiveness, innovation, and economic performance in the long run.

These findings are consistent with endogenous growth theory, which views knowledge generation and innovation as primary drivers of sustainable economic growth (Aghion et al., 2019; Romer, 1990). Firms that continue to acquire and apply knowledge are in a better position to improve their internal operating processes, develop innovative solutions, and respond to changes in their markets. These findings are also consistent with prior research that emphasized the importance of learning capabilities in achieving organizational performance and innovation outcomes (Zahra & George, 2002; Argote, 2013).

Within the context of the Jordanian manufacturing sector, these findings underscore the significance of promoting learning-oriented cultures and knowledge-sharing practices among organizations. Those organizations that focus on developing their employees' skills/knowledge, manage knowledge effectively, and promote ongoing employee learning are more likely to achieve long-term sustainability and competitiveness in increasingly dynamic business environments.

Finally, the results of the study also indicated a significant direct effect of AI technology adoption on sustainable economic growth, thereby providing support for H3. These findings indicate that AI technologies contribute directly to organizational productivity, operational efficiency, innovation capacity, and long-term competitiveness.

These findings are consistent with the resource-based view of strategy (Barney, 1991), which posits that when effectively applied, strategic technological resources can lead to superior organizational performance and competitive advantages. AI technologies improve decision-making quality, eliminate the need for repetitive tasks, reduce waste by optimizing resource utilization, and stimulate innovation, all of which contribute directly to improved economic performance. These findings are also consistent with prior studies identifying AI as one of the key factors driving improvements in productivity and economic growth (Brynjolfsson et al., 2021; Aghion et al., 2019). The significance of this study is especially pertinent to the industrial sector in Jordan, because digital transformation and technological modernization are major priorities for the sector. Businesses that will be able to successfully integrate artificial intelligence technologies into their operations will likely realize considerable enhancements in

both efficiency and competitiveness and therefore make significant contributions toward greater economic development.

A significant mediator role was found within the context of this study with respect to organizational learning as it relates to the relationship between the adoption of AI technologies and sustainable economic growth. The results of the mediation analysis indicated that organizational learning partially mediates this relationship, thus providing support for hypothesis 4. These results indicate that although the direct contribution to growth provided by the adoption of AI technology has been well documented, a large component of the overall impact of AI technology on growth is due to the transmission of its effects via learning processes through which new knowledge is acquired, disseminated, and applied. These results offer substantial evidence in support of the integrated theoretical framework that underlies this study.

From a resource-based view perspective, AI represents an important and valuable organizational resource. This value will only be realized when organizations have complementary capabilities enabling them to effectively utilize AI. (Barney 1991) (In other words, convert AI-generated information into actionable knowledge); and likewise, dynamic capabilities theory suggests that organizations need to continually adapt and reconfigure their knowledge resources to derive value from technological innovations. (Teece 2007, 2021). Additionally, these empirical findings represent empirical evidence supporting endogenous growth theory by indicating that mechanisms for creating and disseminating knowledge are key mechanisms through which technological innovation contributes to economic growth. The insights created using AI technologies constitute valuable sources of information and analytical insights. Nonetheless, these insights do not contribute to economic growth unless organizations successfully create new ideas, improve decision-making processes, and operational improvements as a result of such insights.

Generally speaking, the findings of this study illustrate that it is not merely through technology that sustainable economic growth occurs. To achieve sustainable economic growth, organizations must develop learning capabilities that enable them to absorb, interpret, and utilize AI-generated knowledge appropriately.

6. Theoretical and Practical Implications

6.1 Theoretical Implications

This study has several key theoretical implications for the Artificial Intelligence, Organizational Learning (OL), and Sustainable Economic Growth (SEG) literatures. In terms of its contribution to the SEG literature, this study supports the theory that the potential benefits of adopting AI can be realized in an array of ways that go far beyond improved operational efficiency and technological advancements; the current study is one of the first to provide empirical evidence supporting the claim that AI adoption positively contributes to the attainment of sustainable economic growth among industrial organizations.

Additionally, this study enhances the Resource-Based View literature in two ways: First, this study confirms that AI is a strategically useful resource whose effective use results in superior organizational outcomes. Second, while the literature generally suggests that acquiring a valuable strategic resource such as AI will result in increased competitive advantage for the firm, this study also shows that the value of AI is not simply generated by possessing the resource itself, but rather by how well the organization leverages and uses the knowledge created by the AI. Therefore, consistent with the RBV, this study supports the view that the source of competitive advantage lies in the combination of strategically useful resources and organizational capabilities.

Further, this study builds upon dynamic capabilities theory by identifying OL as an essential capability through which firms convert their technological innovations into successful innovations, productivity improvements, and ultimately SEG. Moreover, as expected based on the dynamic capabilities perspective, the large mediation effect of OL indicates that technological investment alone does not lead to superior performance. Instead, organizations need to build capabilities that enable them to acquire, disseminate, and apply knowledge.

In addition, this study adds to Endogenous Growth Theory by empirically illustrating that knowledge creation and OL represent important mechanisms that connect technological innovation and economic growth. As such, these findings lend credence to the notion that SEG is generated not only through investing in new technologies but also through creating organizational processes that transform knowledge into productive outputs.

Lastly, this study fills a gap in the literature examining AI adoption in developing economies. The majority of prior studies have examined AI adoption in developed countries with robust technological infrastructure. By studying AI adoption in Jordanian industrial organizations, this study increases the geographic scope of research on technology-based growth in developing country contexts.

6.2 Practical Implications

Several important practical implications arise from this research with respect to managing, policymaking, and industrial organization. These include: Managers must understand how to strategically use AI as an organizational resource; i.e., in terms of its use in strategic planning, operational processes, and decision making. This will allow them to maximize the contributions made to productivity, innovation, and competitive advantage.

Also, managers need to develop a culture of organizational learning to realize the full potential of their investment in AI. They should create knowledge-sharing systems that facilitate continuous learning among employees. Therefore, they should invest in employee training programs that enable employees to better understand and apply the ideas generated by AI.

Industrial organizations require both the development of technological infrastructure and learning-oriented organizational cultures if they are to successfully transition to a digital economy. Thus, when

investing in AI technology, they should simultaneously implement policies that enhance collaboration, knowledge management, and organizational adaptability.

Finally, policymakers have several important roles to play. Those wishing to pursue economic modernization through the rapid adoption of AI technologies should develop digital transformation strategies, build out the technological infrastructure required to support such innovations, and fund programs that support innovation. Policymakers also have a critical role to play in developing national programs that support digital literacy and strengthen the skills base of the workforce, including those associated with organizational learning. These actions will assist companies in utilizing AI more effectively and achieve broader economic development goals.

These findings reinforce current government initiatives aimed at promoting economic modernization and digital transformation. By encouraging the utilization of AI and supporting the development of organizational learning capabilities, these initiatives could increase industrial productivity, stimulate innovation, and enhance the international competitiveness of Jordan's private sector companies. As such, policymakers and business leaders alike should consider AI and organizational learning as complementary means of achieving sustainable economic growth rather than two separate organizational initiatives.

7. Conclusion, Limitations, and Future Research Directions

7.1 Conclusion

This research examined the effect of Artificial Intelligence on sustainable economic growth, in addition to studying how organizational learning acts as a mediator for this effect. Organizational Learning is based upon the Resource-Based View, dynamic capabilities theory, and endogenous growth theory, all of which were used to develop and test a conceptual model relating AI, organizational learning, and sustainable economic growth.

Results indicated that there was a positive correlation with regard to AI and both organizational learning and sustainable economic growth. The findings also indicated that organizational learning had a significant correlation with sustainable economic growth, and while organizational learning did partially mediate the relationship between AI adoption and economic performance, it did not fully mediate it. The results show that companies are able to derive additional economic benefits from their investment in AI technology if the company has robust learning capabilities to capture, disseminate, and apply the knowledge created through the use of AI technology.

The results of the study support that AI can contribute to long-term competitiveness and sustainability through increased productivity. The extent to which such effects may occur will depend on whether or not the organization is able to convert the data/information collected using AI into actionable knowledge and/or strategic value. As such, organizational learning is shown to be an important capability that increases the effectiveness of AI implementation and creates sustainable economic effects.

In summary, this study adds to the existing body of research relating to AI and its contribution to economic development. Specifically, this study provides empirical data from a developing country and demonstrates the significance of organizational learning as a means through which technological innovations create sustainable growth.

7.2 Limitations

Although this research has contributed to an important area of study, it is also limited by certain conditions. The most significant limitation was that the study was conducted utilizing a cross-sectional approach. Cross-sectional methods do not allow researchers to determine cause and effect. Therefore, future studies will need to use longitudinal methods so that the researcher can observe if the effects of adopting AI are stable across time.

Another limitation was that the study only included industrial organizations in Jordan. Because of this, the results of this study cannot be generalized to all other types of organizations (sectors) nor to other countries. Each country has its own unique set of institutions and technological environments. Thus, the results of this study may not apply elsewhere.

A third limitation was that the primary source of data for this study was based on responses to survey questions by managers. Surveys are typically susceptible to common method bias and subjectivity. In order to limit the impact of common method bias and subjectivity, the researcher used some procedural remedies. Nevertheless, future researchers could collect data from multiple sources, including objective measures of an organization's overall performance.

A fourth limitation of the current study is that the only mediator studied was organizational learning. There are many other organizational capabilities and contextual characteristics that could potentially affect the relationship between the adoption of AI and sustainable economic growth. Therefore, future studies should seek to identify the additional potential mediators and examine them in detail.

7.3 Future Research Directions

There are several avenues in which future research could build upon this study. A first avenue is to conduct longitudinal research to gain greater insight into the temporal relationship between AI adoption, organizational learning, and sustainable economic growth. This type of research would permit researchers to understand how long-term investments in AI create value for an organization over time.

In addition to examining the relationship between AI adoption and organizational learning, future research could focus on other potential mediating mechanisms such as an organization's innovation capability, knowledge management system, organizational agility, digital transformation capability, or absorptive capacity. Understanding each of these variables would likely provide a much better comprehension of the way in which AI influences organizational and economic outcomes.

Comparative research involving various industry segments and geographic regions would increase the generalizability of the results of this study and help researchers understand both the similarities and

differences in how organizations implement and use AI. Comparing these differences could lead to a greater understanding of how differing institutional environments influence technology-driven economic growth.

As mentioned earlier, researchers studying AI have identified several moderating variables (such as cultural orientation, leader support for IT, level of technological sophistication, and degree of environmental uncertainty) that can either facilitate or hinder the effectiveness of AI adoption and organizational learning as a means to achieve sustainable economic outcomes. Researchers may want to include one or more of these moderating variables as part of their future research endeavors.

The last possible direction for future research is to examine the evolving nature of AI applications and their impacts on areas such as sustainability, innovation, employee development, and competitive advantage. As new forms of AI emerge, researchers will need to continually assess the implications of these new developments for organizations and society as a whole.

Declarations

Ethical approval

Ethical approval for this study was obtained from the Research Ethics Committee at the Faculty of Business, Applied Science Private University. All research procedures were conducted in accordance with relevant institutional guidelines and regulations, as well as the ethical principles outlined in the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants included in this study. Participation was voluntary, and respondents were assured of anonymity and confidentiality prior to completing the questionnaire.

Consent to publish

All authors have reviewed and approved the final version of the manuscript for publication.

Competing interests

The authors declare no competing interests.

Additional information

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Author Contribution

Saed Adnan Mustafa (SAM) and Tariq Talafha (TT) conceptualized the study and designed the research framework. SAM, TT, and Ahmad Ali Eyadat (AAE) developed the research methodology and theoretical foundation. SAM and TT conducted the data collection and performed the statistical analysis using PLS-SEM. AAE, Anas G. Kanaan (AGK), and Odai Mansour (OM) contributed to the literature review and validation of the research model. SAM and Oualid Ali (OA) prepared the original manuscript draft. AGK, OM, and Amro Saleem Alamaren (ASA) contributed to the interpretation of findings, discussion development, and critical revision of the manuscript. SAM supervised the research project and coordinated the publication process. All authors reviewed, edited, and approved the final version of the manuscript.

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