UNRAVELING THE INFLUENCE OF ARTIFICIAL INTELLIGENCE, ORGANIZATIONAL, AND ENVIRONMENTAL FACTORS IN STRATEGIC PLANNING: IMPLICATIONS AND PRACTICAL INSIGHTS

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ABSTRACT

This study explores how artificial intelligence (AI) affects organizational strategy planning. We discovered through thorough empirical investigation that the strategic planning process is not greatly impacted by AI in our particular corporate environment. This finding has important implications for resource allocation, indicating that businesses should carefully consider how much money, time, and talent they devote to AI projects based on their sector and operational context. Our study promotes a balanced strategy, emphasizing the significance of integrating AI with conventional strategic planning techniques to improve decision-making. We additionally emphasize the importance of enterprises determining their level of AI maturity and providing flexible guidelines for AI integration. For enterprises attempting to traverse the complex interaction between AI and strategic planning, real-world case studies, decision support tools, change management techniques, and a proposed research agenda all contribute to the provision of thorough insights and practical recommendations. In the end, this research aims to improve strategic planning procedures by providing useful advice or the adoption and integration of AI.

Keywords: *Unraveling, Artificial Intelligence, Organizational, Environmental Factors, Strategic Planning.*

1. INTRODUCTION

Artificial intelligence (AI) has the potential to totally transform a number of industries and businesses, including strategic planning. Innovation in strategic planning is essential in today's quickly changing and fiercely competitive global environment, especially for emerging nations (Abualoush, Obeidat, Aljawarneh, Al-Qudah, & Bataineh, 2022; Dwivedi et al., 2021; Lee, Suh, Roy, & Baucus, 2019). Traditional approaches to strategic planning usually fall short in addressing these concerns due to limitations in data analysis, decision-making processes, and the ability to effectively leverage new trends. However, the use of AI approaches gives fresh chances to get over these constraints and unleash creative potential (Alawamreh & Elias, 2015; Okunlaya, Syed Abdullah, & Alias, 2022; Sá & Serpa, 2020).

AI techniques like machine learning, natural language processing, and predictive analytics can help strategic planning and decision-making processes and offer insightful information. These methods make it possible to analyze huge amounts of data from numerous sources, such as competition analyses, market trends, and customer behavior. AI enables strategic planners to make more informed decisions and spot novel opportunities that could go undiscovered otherwise by extracting relevant patterns and trends. Moreover, AI techniques enhance the accuracy and efficiency of forecasting future scenarios, allowing organizations to proactively adapt and respond to changing

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dynamics (Alawamreh & Elias, 2015; Aristodemou & Tietze, 2018; Hariri, Fredericks, & Bowers, 2019). For developing nations looking to harness innovation and maximize their economic edge in an increasingly globalized and digitalized world, this competence is especially important. AI can also help automate repetitive jobs and processes, freeing up valuable human resources to devote themselves to more high-level strategic work. Organizations in developing nations are able to utilize their limited resources more wisely thanks to the enhanced productivity and efficiency, which helps them compete globally and promote sustainable growth. Despite the fact that AI has the ability to significantly improve strategic planning innovation, it is necessary to recognize the difficulties and moral dilemmas that come with its application. In order to ensure that AI is utilized ethically and inclusively, concerns including data privacy, algorithmic bias, and the displacement of specific job types must be carefully considered. The effective adoption and application of artificial intelligence (AI) approaches for innovation in strategic planning presents substantial hurdles for developing nations. Their capacity to take use of AI's promise for sustainable development and economic progress is hampered by a lack of data access, resource limitations, technological preparedness, cultural resistance, and ethical problems. For opportunities to be opened, decision-making to be improved, and innovation to be sparked in strategic planning, these obstacles must be removed. (Alosani, Yusoff, & Al-Dhaafri, 2020; Fenwick, Vermeulen, & Corrales, 2018).

This paper seeks to explore the potential of AI techniques in achieving innovation in strategic planning within the context of a developing country. By leveraging AI's capabilities, organizations can gain a competitive edge, drive sustainable growth, and overcome the unique challenges they face. The subsequent sections of this paper will delve into specific AI techniques and their applications in strategic planning, examine case studies of successful implementation, and provide recommendations for policymakers and organizations in developing countries to effectively harness the power of AI for innovation in strategic planning. The objective of this research is to examine the role and impact of artificial intelligence (AI) techniques in achieving innovation in strategic planning. Consequently, the research aims to investigate the organizational and environmental factors that influence the successful adoption and implementation of AI techniques in strategic planning

2. THE PROPOSED MODEL OF TECHNOLOGY-ORGANIZATION-ENVIRONMENT (TOE)

The Technology-Organization-Environment (TOE) hypothesis offers an insightful framework for comprehending the adoption and application of artificial intelligence (AI) techniques to achieve innovation in strategic planning inside developing nations. The hypothesis acknowledges that organizational and environmental elements unique to developing countries have an impact on how successfully AI is integrated, in addition to the technology itself (Awa, Ukoha, & Igwe, 2017). The "Technology" element of the TOE theory in the context of AI takes into account the distinctive qualities and capabilities of AI approaches in strategic planning. This encompasses the difficulty of AI algorithms, how well existing systems work with AI tools, and the perceived advantages of using AI for innovation (Awa, Ojiabo, & Orokor, 2017; Awa, Ukoha, et al., 2017). Organizations in developing nations can evaluate the viability and potential impact of AI approaches in their strategic planning processes by understanding these technological characteristics. The "Organization" element of the TOE theory deals with internal organizational aspects that affect the adoption and application of AI technology. Structure, culture, resources, and capabilities of the organization are all included. Developing countries may face resource constraints, limited access to AI expertise, and resistance to change due to cultural factors (Oliver & Reddy Kandadi, 2006). By considering these organizational factors, organizations can identify strategies to overcome barriers and create an environment conducive to the effective adoption and utilization of AI in strategic planning. The "Environment" part of the TOE theory acknowledges that the adoption of AI techniques in emerging nations is significantly influenced by the external context of those nations. Essential concerns include things like the state of the economy, legal frameworks, and the accessibility of data infrastructure. The availability and quality of data, as well as legislative frameworks that must be customized to enable the responsible and inclusive use of AI in strategic planning, may present difficulties for developing countries (Al Mawadieh, Al-Badawi, & Al-Sarairah, 2020; Skafi, Yunis, & Zekri, 2020). Organizations and politicians in developing nations can obtain a thorough grasp of how technology, organization, and environment interact when implementing AI strategies for innovation in strategic planning by utilizing the TOE theory. To overcome obstacles and maximize

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the potential benefits of AI in promoting sustainable development and economic growth, this knowledge can be used to inform decision-making processes, resource allocation, and policy formulation (Hasani, Rezania, Levallet, O'Reilly, & Mohammadi, 2023). The TOE theory is an invaluable tool for negotiating the difficulties of AI adoption and implementation within the particular setting of emerging nations.

- H1. Orgnization has made a significant impact on strategic planning processes
- H2. Environmen has made a significant impact on strategic planning processes
- H3. AI adoption has made a significant impact on strategic planning processes

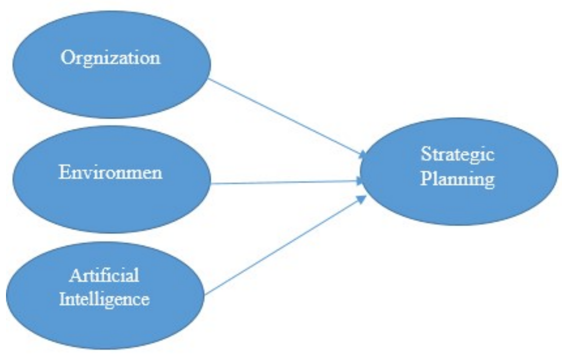

Figure 1 Proposed Framework

3. METHODOLOGY

This study's specific research methodology is provided. This section covers the following topics: Population, Sample Size, and Sampling Procedure (Rich-Edwards, Kaiser, Chen, Manson, & Goldstein, 2018). The data was gathered using a cross-sectional field survey study design, and quantitative research methods will be applied. Because survey questionnaires enable researchers to gather data on beliefs, actions, or situations from a random sample of respondents in the field, a cross-sectional field survey study design was utilized (Al-Safarini, Alramahi, Al-Mawadieh, Al-Tarawneh, & Fakhir, 2023; Al Mawadieh et al., 2020; Alawamreh & Elias, 2015; Leavy, 2017).

A. Population and Sample size

The study's target population consisted of all Zarqa University and Jordan University staff members who took part in the survey. As a consequence, we randomly selected 230 candidates from a group of 206 (Maiyaki & Mohd Mokhtar, 2011; Wang & Sekaran, 2010). The sample size is sufficient, and the response rate is comparable to that of numerous other researchers working in the same field.

B. Sample procedure

The researcher have employed a simple random sampling strategy to get the data necessary for the current investigation. There are two steps in this procedure. The researcher will initially select a group of volunteers at random. In the second stage, the researcher chose a number of employees at random from various sections until the required sample size was attained (Hénin, Lelièvre, Shirts, Valsson, & Delemotte, 2022; Wright & Panchapakesan, 1969).

4. DATA ANALYSIS AND FINDINGS

In order to assess the data, descriptive statistics were performed utilizing SPSS version 22, and latent variables in the causal structure were examined using Smart PLS version 3. The outcomes of the statistical analysis are presented in later parts.

A. Evaluation of the Measurement Model

In the study, by Hair Jr, Hult, Ringle, and Sarstedt (2016) the survey's measurement model verification was a crucial aspect of the Partial Least Squares (PLS) procedure. This process, assessing both reflective and formative constructs, centered on the fundamental criteria of reliability and validity. Reliability aimed to ensure the consistent measurement of the instrument's intended aspects, while validity assessed how well it captured the targeted concepts. This assessment was carried out through a three-step procedure, encompassing indicator items' reliability, convergent validity, and discriminant validity, ensuring the survey instrument's robustness and effectiveness in measuring the desired constructs.(Sekaran & Bougie, 2016).

The measurement model was investigated using 16 reflected indicators, as shown in Fig. 2. It was discovered that the factor loading for item EN3 was less than 0.50. As suggested by Hair, Ringle, and Sarstedt (2011) and Henseler, Ringle, and Sinkovics (2009), In this study, items with variable factor loading values falling among 0.40 and 0.70 were considered for potential exclusion. The choice to eliminate an indicator was made based on whether doing so would cause the composite reliability (CR) to rise over the suggested level. A PLS algorithm test was performed to make this judgment, and signs that satisfied these requirements were thereafter disregarded from the analysis.

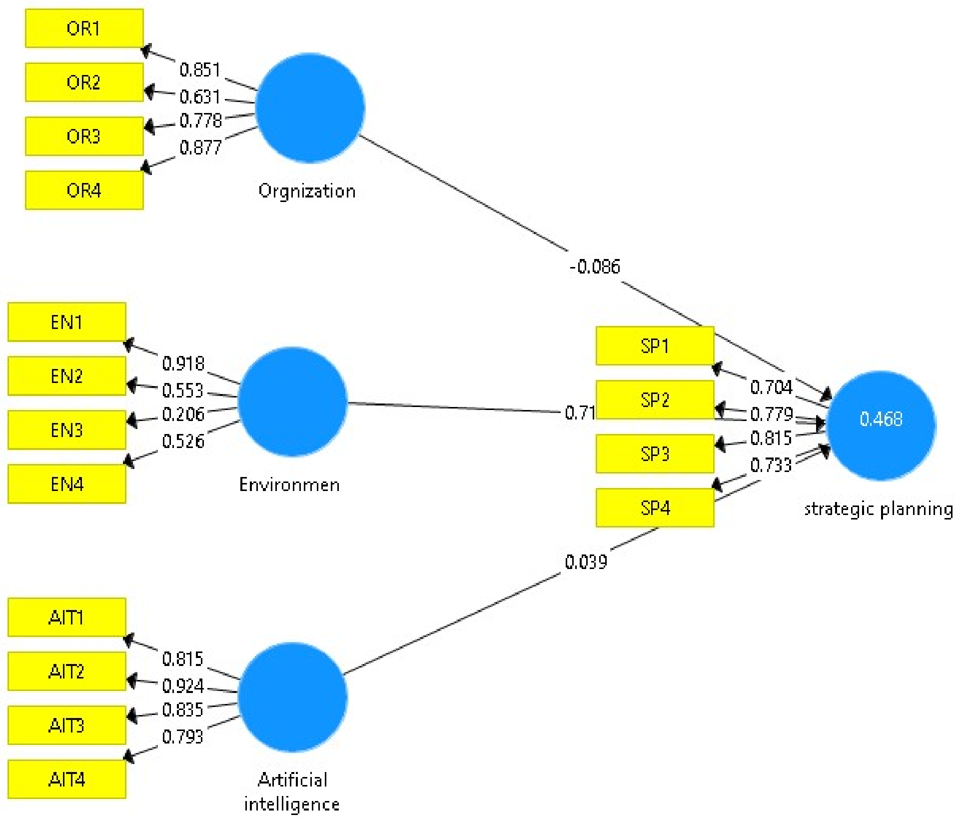

Figure 2 Measurement Model

The convergent validity of each concept evaluated depended on the Average Variance Extracted (AVE), as indicated in Table 1. The degree to which a measure has a positive connection with additional measures of the same construct is known as convergent validity (Hair Jr et al., 2016). In this study, 0.5 was adopted as the acceptable minimum value of AVE as recommended by previous studies (Hair Jr et al., 2016; Ramayah, Ling, Taghizadeh, & Rahman, 2016). The findings reveal that although environment had the lowest acceptable value (0.367), AI technology had the greatest value for AVE (0.711). In relation to their convergent validity, all of these values were, to put it briefly, at acceptable levels. The CR values were used in Table 1 to evaluate the internal consistency of the various structures. A greater CR value is preferred even though it is advised that the benchmark CR value be at least 0.70. The CR values in this investigation exceeded the benchmark value, ranging from 0.866 to 0.925 for each construct. This shows that the variables have in fact shown strong convergent validity when compared to the given standards.

Table 4 Results of Measurement Model

Variable	Items	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)>50%
Orgnization	OR1	0.851	0.868	0.624
	OR2	0. 631		

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	OR3	0. 778		
	OR4	0.877		
Environment	EN1	0.918	0.657	0.367
	EN 2	0.553		
	EN 3	0.206		
	EN4	0.526		
Artificial Intelligence	AI1	0.815	0.709	0.711
	AI2	0. 924		
	AI3	0.835		
	AI4	0.973		
Strategic Planning	SP1	0.704	0.844	0.576
	SP 2	0.977		
	SP 3	0.815		
	SP4	0.733		

The existing work applied the Fornell and Larcker (1981) and Henseler, Ringle, and Sarstedt (2015) criteria for judging the tested constructs' discriminant validity. A given construct is considered to have such discriminant validity if the average square root of extracted variance is higher than the correlation values across all variables (Hair Jr et al., 2016). The findings, as per the Fornell and Larcker criterion, indicate that each concept displays satisfactory discriminant validity, as indicated in Table 2. The fact that the squared correlation for each construct is smaller than the average variance retrieved leads to this conclusion. The Heterotrait-Monotrait Ratio (HTMT), which aligns with construct score creation without attenuation, was also used to assess the connection across constructs. The results of this investigation show that all constructs meet the requirements for discriminant validity, showing no evidence of insufficient discriminant validity, and are shown in Table 2 at a threshold of 0.9.

Table 3. Assessment of Discriminant Validity (Fornell & Larcker, 1981)

	Artificial Intelligence	Environment	Organization	Strategic Planning
Artificial Intelligence	0.843			
Environment	0.446	0.606		
Organization	0.525	0.610	0.790	
Strategic Planning	0.313	0.681	0.371	0.759

Table 3: Assessment of Discriminant Validity (HTMT) (Henseler et al., 2015)

	Artificial Intelligence	Environment	Organization	Strategic Planning
Artificial Intelligence				
Environment	0.697			
Organization	0.578	1.039		
Strategic Planning	0.370	0.873	0.447	

The parameter estimates and statistical significance of the parameter estimates show that the results for all constructs, including Organization, Environment, and Artificial Intelligence, are reliable measures of those constructs. In conclusion, the results demonstrate the measurement model's validity, convergent validity, and discriminant validity in this investigation.

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B. Evaluation of the Structural Model

The structural model, also known as the inner model, in this study depicts the cause-and-effect connections between the analyzed constructs. Therefore, analyzing the study hypotheses underlying the anticipated linkages or effects between these constructs is necessary in order to assess the structural model. Path coefficients (ß) were used in the study as criteria to test the six research hypotheses in order to achieve this. These route coefficients, which vary from -1 to +1, are standardized. In contrast, negative values imply a strong negative link. A route coefficient value that approaches +1 denotes a strong positive relationship between two constructs (Hair Jr et al., 2016). The fact that the t-value is higher than a given critical value indicates that the coefficient is significant at a given error probability when utilizing this path coefficient value to determine the significance level of the relationships. For instance, a significance level with a p-value of 0.05 is represented by a t-value > 1.96.

The main criterion for assessing the quality of a structural model is how well it measures the path coefficients' significance levels and determination coefficients, or "beta values," because the higher the Adjusted value, the better the structural equation is at explaining the exogenous variable. (Hair, Ringle, Sarstedt, & Practice, 2011).

The results from the examination of the research hypotheses displayed in Figure 3 and Table 4 demonstrate that one of the proposed research hypotheses has been confirmed while two others have not. The results also indicate that the Organization significantly doesn't influence strategic planning (ß = -0.016, t = 0.199, $p < 0.05$). Therefore, H1 is not supported. This findings show that the Organization significantly lacks control over strategic planning. Several elements, including the organizational structure, the leadership style, or the particular setting in which the study was done, may be to blame for this lack of influence. It's crucial to take these into account and possibly further investigate them in next studies to comprehend why this relationship did not show significance (Ahmad & Ahmad, 2019; Kerzner, 2019; Qawaqneh, Ahmad, & Alawamreh, 2023; Rehman, Mohamed, & Ayoup, 2019).

Environment significantly and positively influence strategic planning ß = 0.668, t = 10.605, $p < 0.05$). Consequently, H2 is supported. Artificial intelligence does not significantly influence strategic planning (ß = 0.014, t = 0.278, $p < 0.05$). Consequently, H3 is not supported. It's possible that AI wasn't properly incorporated into the procedures for strategic planning. Insufficient AI skills, limited AI acceptance, or insufficient AI training could limit AI's ability to impact strategic decision-making. Consequently, the impact of AI on strategy planning may not be as great for smaller or less technologically proficient firms as it is for larger, tech-savvy ones (Chiu & Chai, 2020; Gulin, Hladika, & Valenta, 2019).

Table 4. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV)	P Values
Artificial intelligence -> strategic planning	0.014	0.012	0.050	0.278	0.781
Environment -> strategic planning	0.668	0.666	0.063	10.605	0.000
Organization -> strategic planning	-0.016	0.002	0.082	0.199	0.842

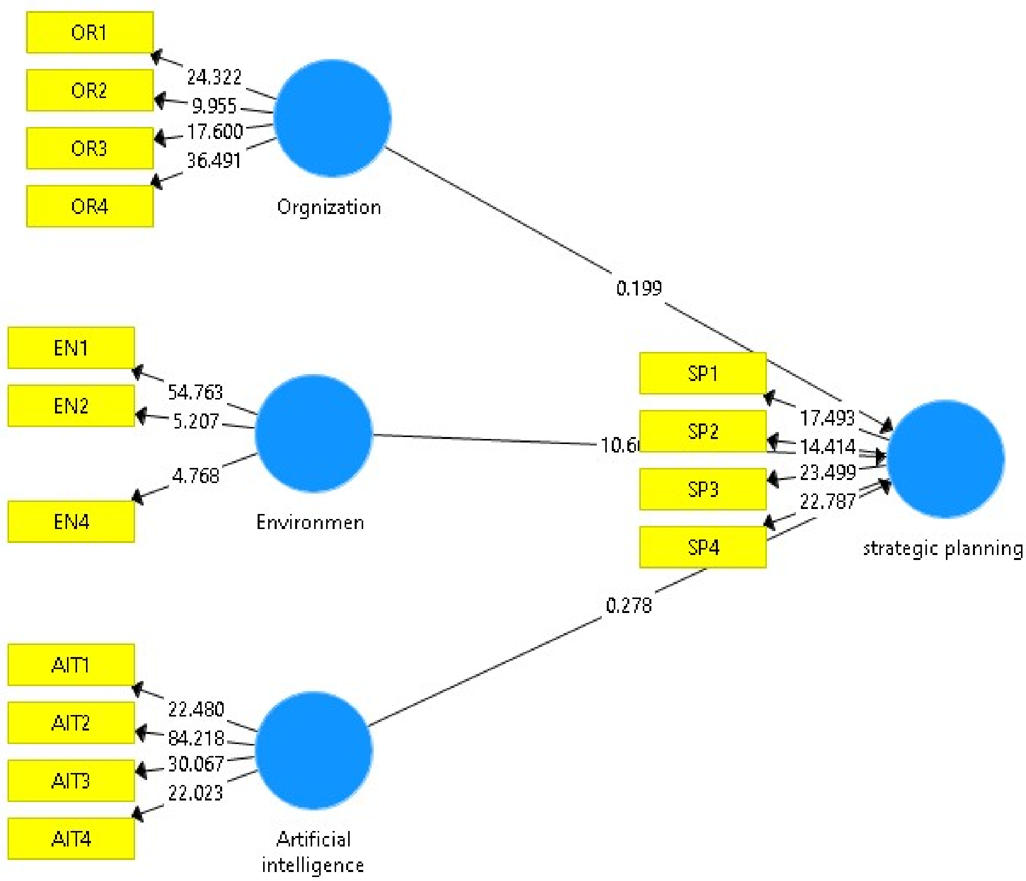

Fig. 3 Structural Model

5. IMPLICATION AND CONTRIBUTION

The findings that "Artificial intelligence does not significantly influence strategic planning" have a number of key ramifications and practical applications for enterprises. First, firms should critically assess how they are allocating resources for AI efforts within the context of strategic planning, taking into account their unique demands and the environment of their respective industries. Second, a balanced approach between conventional strategic planning techniques and AI integration is stressed, as AI can offer insightful data to support decision-making. Third, companies should evaluate their existing AI maturity level and match it to their strategic planning objectives, putting an emphasis on developing fundamental AI skills as needed. Organizations can improve their strategic planning processes by offering customizable guidelines for AI integration, displaying case studies, and creating decision support tools. This study offers thorough insights and suggestions to successfully negotiate the interaction between artificial intelligence and strategic planning by addressing change management tactics and suggesting topics for further investigation.

REFRENCES:

[1]. Abualoush, S, Obeidat, A, Aljawarneh, N, Al-Qudah, S, & Bataineh, K. (2022). The effect of knowledge sharing on the relationship between empowerment, service innovative behavior and entrepreneurship. *International Journal of Data and Network Science, 6*(2), 419-428.

[2]. Ahmad, Israr, & Ahmad, Shuhymee Bin. (2019). The mediation effect of strategic planning on the relationship between business skills and firm's performance: Evidence from medium enterprises in Punjab, Pakistan. *Opción: Revista de Ciencias Humanas y Sociales*(24), 746-778.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[3]. Al-Safarini, Maram Y, Alramahi, Nidal, Al-Mawadieh, Reda SM, Al-Tarawneh, Issa abdulwahab, & Fakhir, Luma. (2023). Attitudes of Students in the Faculty of Educational Sciences in "Zarqa University" Towards Distance-Education Using Educational Technology "in the Light of "the COVID-19 Crisis"" *From Industry 4.0 to Industry 5.0: Mapping the Transitions* (pp. 619-630): Springer.

[4]. Al Mawadieh, Reda SM, Al-Badawi, Mohammed, & Al-Sarairah, Khaled. (2020). The Reality of Risk Management in Private Jordanian Universities from the Viewpoint of Faculty Members. *International Journal of Higher Education, 9*(5), 274-282.

[5]. Alawamreh, Ali Ratib, & Elias, Nur Fazidah. (2015). EXAMINING THE EFFECTIVENESS OF USING WEB-BASED LEARNING FOR GIFTED STUDENTS: JORDAN AS CASE STUDY. *Journal of Theoretical & Applied Information Technology, 76*(2).

[6]. Alosani, Mohammed Saleh, Yusoff, Rushami, & Al-Dhaafri, Hassan. (2020). The effect of innovation and strategic planning on enhancing organizational performance of Dubai Police. *Innovation & Management Review, 17*(1), 2-24.

[7]. Aristodemou, Leonidas, & Tietze, Frank. (2018). The state-of-the-art on Intellectual Property Analytics (IPA): A literature review on artificial intelligence, machine learning and deep learning methods for analysing intellectual property (IP) data. *World Patent Information, 55*, 37-51.

[8]. Awa, Hart O, Ojiabo, Ojiabo Ukoha, & Orokor, Longlife E. (2017). Integrated technology-organization-environment (TOE) taxonomies for technology adoption. *Journal of Enterprise Information Management*.

[9]. Awa, Hart O, Ukoha, Ojiabo, & Igwe, Sunny R. (2017). Revisiting technology-organization-environment (TOE) theory for enriched applicability. *The Bottom Line, 30*(01), 2-22.

[10]. Chiu, Thomas KF, & Chai, Ching-sing. (2020). Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective. *Sustainability, 12*(14), 5568.

[11]. Dwivedi, Yogesh K, Hughes, Laurie, Ismagilova, Elvira, Aarts, Gert, Coombs, Crispin, Crick, Tom, . . . Eirug, Aled. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*, 101994.

[12]. Fenwick, Mark, Vermeulen, Erik PM, & Corrales, Marcelo. (2018). Business and regulatory responses to artificial intelligence: Dynamic regulation, innovation ecosystems and the strategic management of disruptive technology *Robotics, AI and the Future of Law* (pp. 81-103): Springer.

[13]. Fornell, Claes, & Larcker, David F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research*, 382-388.

[14]. Gulin, Danimir, Hladika, Mirjana, & Valenta, Ivana. (2019). Digitalization and the Challenges for the Accounting Profession. *ENTRENOVA-ENTerprise REsearch InNOVAtion, 5*(1), 428-437.

[15]. Hair, Joe F, Ringle, Christian M, & Sarstedt, Marko. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152.

[16]. Hair, Joe F, Ringle, Christian M, Sarstedt, Marko %J Journal of Marketing theory, & Practice. (2011). PLS-SEM: Indeed a silver bullet. *19*(2), 139-152.

[17]. Hair Jr, Joseph F, Hult, G Tomas M, Ringle, Christian, & Sarstedt, Marko. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.

[18]. Hariri, Reihaneh H, Fredericks, Erik M, & Bowers, Kate M. (2019). Uncertainty in big data analytics: survey, opportunities, and challenges. *Journal of Big Data, 6*(1), 1-16.

[19]. Hasani, Tahereh, Rezania, Davar, Levallet, Nadège, O'Reilly, Norman, & Mohammadi, Mohammad. (2023). Privacy enhancing technology adoption and its impact on SMEs' performance. *International Journal of Engineering Business Management, 15*, 18479790231172874.

[20]. Hénin, Jérôme, Lelièvre, Tony, Shirts, Michael R, Valsson, Omar, & Delemotte, Lucie. (2022). Enhanced sampling methods for molecular dynamics simulations. *arXiv preprint arXiv:2202.04164*.

[21]. Henseler, Jörg, Ringle, Christian M, & Sarstedt, Marko. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*(1), 115-135.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[22]. Henseler, Jörg, Ringle, Christian M, & Sinkovics, Rudolf R. (2009). The use of partial least squares path modeling in international marketing *New challenges to international marketing* (pp. 277-319): Emerald Group Publishing Limited.
[23]. Kerzner, Harold. (2019). *Using the project management maturity model: strategic planning for project management*: John Wiley & Sons.
[24]. Leavy, Patricia. (2017). Research Design: Quantitative. *Qualitative, Mixed Methods, Arts-Based, and Community-Based Participatory Research Approaches, 20*.
[25]. Lee, Jaehun, Suh, Taewon, Roy, Daniel, & Baucus, Melissa. (2019). Emerging technology and business model innovation: the case of artificial intelligence. *Journal of Open Innovation: Technology, Market, and Complexity, 5*(3), 44.
[26]. Okunlaya, Rifqah Olufunmilayo, Syed Abdullah, Norris, & Alias, Rose Alinda. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech, 40*(6), 1869-1892.
[27]. Oliver, Stan, & Reddy Kandadi, Kondal. (2006). How to develop knowledge culture in organizations? A multiple case study of large distributed organizations. *Journal of knowledge management, 10*(4), 6-24.
[28]. Qawaqneh, Haitham, Ahmad, Fadi Bani, & Alawamreh, Ali Ratib. (2023). The Impact of Artificial Intelligence-Based Virtual Laboratories on Developing Students' Motivation Towards Learning Mathematics. *International Journal of Emerging Technologies in Learning (Online), 18*(14), 105.
[29]. Ramayah, T, Ling, Niu Swee, Taghizadeh, Seyedeh Khadijeh, & Rahman, Syed Abidur. (2016). Factors influencing SMEs website continuance intention in Malaysia. *Telematics and Informatics, 33*(1), 150-164.
[30]. Rehman, Shafique-ur, Mohamed, Rapiah, & Ayoup, Hazeline. (2019). The mediating role of organizational capabilities between organizational performance and its determinants. *Journal of Global Entrepreneurship Research, 9*(1), 1-23.
[31]. Rich-Edwards, Janet W, Kaiser, Ursula B, Chen, Grace L, Manson, JoAnn E, & Goldstein, Jill M. (2018). Sex and gender differences research design for basic, clinical, and population studies: essentials for investigators. *Endocrine reviews, 39*(4), 424-439.
[32]. Sá, Maria José, & Serpa, Sandro. (2020). The COVID-19 pandemic as an opportunity to foster the sustainable development of teaching in higher education. *Sustainability, 12*(20), 8525.
[33]. Sekaran, Uma, & Bougie, Roger. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.
[34]. Skafi, Mahmoud, Yunis, Manal M, & Zekri, Ahmed. (2020). Factors influencing SMEs' adoption of cloud computing services in Lebanon: An empirical analysis using TOE and contextual theory. *IEEE Access, 8*, 79169-79181.
[35]. Wright, Benjamin, & Panchapakesan, Nargis. (1969). A procedure for sample-free item analysis. *Educational and Psychological measurement, 29*(1), 23-48.