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Is the rise of AI technology scary for HR professionals? Balancing the replacement of employees' skills with AI

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A B S T R A C T

The researchers used positivism to study the effects of artificial intelligence (AI) applications on human resource (HR) productivity through employee technical expertise. This study targeted employees in the health care sector in Jordan. This research used a self-reported questionnaire as the primary data collection tool. We developed this questionnaire by reviewing relevant literature and designed it electronically using Google Forms. The procedures followed in analyzing the initial research data included a series of procedures employing SPSS and AMOS software. The study results indicate that Artificial intelligence applications (AIA) produce a positive effect on HR productivity challenges (HRP) by interplaying the mediating role of employees' technical expertise (ETE) in the sector of the service industry. HR productivity challenges were the essential purpose of investigating the impact of Artificial intelligence applications through employees' technical expertise to decrease challenges and find a balance between the employees' skills and AI Apps implementation instead of replacing HR skills.

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1. Introduction

The attractiveness of technology makes us dive into both the risk and opportunity aspects of artificial intelligence (AI); researchers have revealed that AI applications have been developed from 2014 to 2023. During the current search, we will focus on obstacles human resource (HR) professionals face to clarify details and shed light on dilemmas, even though researchers concentrated more that AI has remarkable advancements in science and technology, obtaining benefits across various sectors and specializations (Al Naqbi et al., 2024). In all scholars' claims, serving humanity better is the goal (Jutel et al., 2023). But, without human interference, it may include audio, video, text, images, and chatbots corresponding to specific criteria (Banh & Strobel, 2023). The study concentrates on controlling productivity challenges within organizations utilizing AI apps. The purpose is to gain a competitive trim by promoting productivity, declining mistakes, enhancing decision-making, and streamlining organizational difficulties (Govori & Sejdija, 2023; Gonçalves et al., 2022; Wamba-Taguimdje et al., 2020).

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Employees' achievements are accomplished through high-performance productivity using automation practices, sweeping data analysis, and decision-making administration to offer exceptional services. Researchers follow obstacles confronting employees in this search to make poise with human finger touches, accentuate ethical situations, and inquire about the use of AI to support the guiltless productivity of scholarly circumstances and address ethical issues. This is true, affirming that technologies such as chatbots should complement, not replace, human skills in the situation response (Al Naqbi et al., 2024). Also, for instance, quick-response QR code technology, used in management through data analysis, requires training skills that many employees currently lack. Nevertheless, AI applications are expected to eventually replace manual HR tasks and employee duties (Govori & Sejdija, 2023).

The current research centered on the service sector, and especially addresses the challenges facing HR professionals. They are striving to balance instead of replacing employee skills with the implementation of AI technology, which can create risky situations. Making sure this gap is filled is essential based on recommendations of scholars (Al Naqbi et al., 2024); Govori and Sejdija, (2023) advised in their recommendation to supply a more comprehensive understanding of the adoption of AI. Polas et al. (2022) focus on the desire to use and adopt AI, which stems from knowledge of the technology. Moreover, Ciampi et al. (2021) found that the primary barrier to AI adoptions is the lack of expertise in this field (Ciampi, 2021). Furthermore, Tuffaha (2024) believes adapting to innovative technologies is a big challenge for HR evolution as an employee-robot co-working, which requires functional knowledge, even though HR AI Apps based on industry 5.0 are still in the early phases.

The question if employees' digital communication skills and their ability to use technology help save time and effort, bridge the gap, strike a balance when using AI, and ensure that technologies support rather than replace human skills. This is important for reducing the occurrence of risky situations that HR professionals face.

Previous studies have highlighted digital expertise as a barrier to the adoption of AI technology. This study aims to explore whether an employee’s technical expertise complements their existing skills instead of replacing them, thus establishing a harmonious balance between human and AI responsibilities and functions.

2. Literature Review and Hypotheses Development

2.1 Artificial Intelligence (APP) and HR productivity challenges

One of the most brilliant AI benefits to foster organization achievements, but at the same time, it seems risky: AI APPs when reshaping organization communications inside and outside. It needs to think about drastically balancing the organization's aspects when performing artificial intelligence (Hassan, 2024), automated routine duties, and analyzing massive datasets powered through AI, enhancing employees' performance (Lepage-Richer & McKelvey, 2022) and letting them concentrate on strategies and tasks (Benbya et al., 2020). The AI app plays a crucial role in the communication platform, analyzing Email threads, SMS, and essential information and reminding employees of their meetings, which increases employee collaboration (Abdeldayem & Aldulaimi, 2020). On the other hand, it creates more challenges when dealing with apps and future work perceptions (Hassan, 2024). Meanwhile, Presbitero and Teng-Calleja (2023), confirmed that bots easily repeat tasks, releasing human employees to other duties; researchers demonstrate AI apps within multiple tools (Hassan, 2024), such as speech recognition (Musleh Alsartawi et al., 2022), translation (Sundar & Lee, 2022), virtual agents through Chatbots (Whig, 2021), and tools to analyze data and make decisions; tools can follow feedback emotionally, human behaviors, and preferences (Berente et al., 2021). Also, Paluch and Wirtz (2020) stated that AI tools play as an employee tasks facilitator during file and video conference sharing, in all participants' different languages (Keding, 2021); and different regions around the world (Al-Sartawi et al., 2022). Meanwhile, Talpur et al. (2021) believe that AI apps and power push the efficiency of organizations more than humans can because they easily handle inquiries and solve complex problems. Additionally, it presents precise information with fewer errors (Paluch & Wirtz 2020), with the essential that AI apps are characterized, reliable, free of bias, and updated tools (Votto, 2021), Human oversight should stay a priority of the organizations and not be supplanted by AI tools (Talpur et al., 2021). Based on prior publications, combining human expertise with AI capabilities is crucial to enhance accuracy, eliminate bias, and address HR productivity challenges. Scholars have demonstrated a positive relationship linking artificial intelligence applications and human resource productivity challenges in service sectors; by following this idea and the former literature, the following hypothesis could formulate:

H_1: *Artificial intelligence applications are linked to productivity challenges in the HR sector of the service industry.*

2.2 Employees' technical expertise As a Mediator

Hassan (2024) states that employee reskilling and upskilling over time will address and mitigate the concerns of job displacement in confronting duties and skills automation; chatbot assistance and all virtual skills not only affect and decrease employees'

workload but also increase the organization's productivity. Moreover, AI applications can improve employees' interactions and knowledge (Benbya et al., 2020). AI fever will probably carry out all the management processes when it reaches maximum efficiency, corresponding to human effectiveness skills and competencies to correctly activate AI apps by excluding bias; the more the company realizes bias, the better adoption; ultimately depending on human expertise (Illescas et al., 2023). Meanwhile, the author (Anagnoste et al., 2020), discusses shaping business automation with new apps and reducing human work by generating more suitable occupations. Saengrith et al. (2022) decided there would be no negotiation regarding employees' tech training, especially concerning the evolution of AI apps and their embedded with the Orgs, and solved the problems resulting from it; the training varies from analyzing doc., focusing group tech, to literature reviews (Saengrith et al., 2022). To establish future competencies, employees must be creative in following up on the communication of AI apps (Frey et al., 2016). To improve the efficiency of training, organizations require the integration of employees' experiences (Billett, 1995).

In the current study, the authors rely on Problem-Based Learning (PBL) as a milestone teaching and learning technique to address employees' problems and obstacles and emphasize the importance of employee expertise in using electronic methods within organizations (Gallagher, 1997). PBL stimulates employees to be self-learners and develop their skills to be more flexible and transferable (Kivela & Kivela, 2005). PBL theory concentrates on aspects related to solving problems, effective communication, technology integration, and decision-making (Lambros, 2013). From all the above literature, Employees' technical expertise can be considered part of the relationship that mediates the artificial intelligence application as the independent variable and the employees' productivity challenges as the dependent variable. In this section, researchers propose a hypothesis to examine if the mediating role of employees' technical expertise balances the relationship rather than replacing employees' skills and functions and decreasing HR employees' challenges. Based on that, the proposed hypothesis could be formulated:

H_2: *Artificial intelligence applications are linked to productivity challenges, affected by the mediating role of employees' technical expertise in the HR sector of the service industry.*

To this end, the current paper proposes the model below to clarify the relationship between variables that consider artificial intelligence applications (IV), HR productivity challenges (DV), and employees' technical expertise (Mediator).

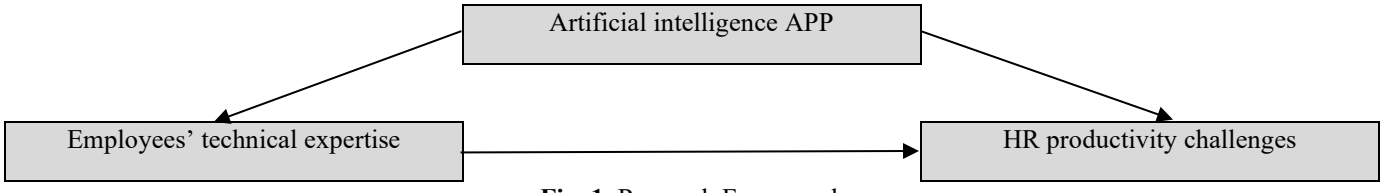

Fig. 1. Research Framework

3. Methodology

The researcher used positivism to study the effects of AI applications on HR productivity through employee technical expertise. This research philosophy allows for generalizing results to a wide range of the target population since it relies on empirical evidence to support the cause-and-effect relationship underlying the research theory and hypotheses. This perspective-positivism is harmonious with quantitative data, which can be obtained from different sources. Questionnaire data were collected to ensure that views of the target population on the research variables and their interrelationships were effectively captured. Secondary data in the form of books, manuscripts, and reports were used in order to gain information about the applications of AI, the productivity of human resources, and the technical skills of employees. Unlike the fast research work, the present research work followed a cross-sectional research design mainly for the purpose of gathering quantitative data within a certain period of time. The cross-sectional design was chosen due to research limitations and the challenge of monitoring variable behaviors over time. This research used a self-reported questionnaire as the primary data collection tool. We developed this questionnaire by reviewing relevant literature and designed it electronically using Google Forms. The questionnaire was administered through email to the study population, and the response was assumed to be from 18th March 2024 to 21st July 2024. It was made up of four major sections, namely, background and research objectives, data archival and data anonymity statement. Also, it had an informed consent form and insured that the participant's involvement in the research was voluntary. In the first part of the survey, the patient's demographic data were collected to distinguish the population based on categorical variables. The remaining three sections utilized a five-point Likert scale ranging from 1, signifying "completely disagree, "to 5, denoting "completely agree, "to assess the primary factors. The second section focused on gathering data related to the independent variable, AI applications, which was measured using six employees. The third section assessed employees' technical expertise, consisting of four items from Benbya et al. (2020). The final section included four items to gauge HR productivity challenges.

This study targeted employees in the health care sector in Jordan. Because of limitations, a sampling technique was used, and the minimum sample size was 385 valid responses according to Hassan (2024). A research questionnaire was provided to 480 staff members to maintain an adequate sample size. A total of 429 questionnaires were returned. Upon initial review, six incomplete and 12 singular-response pattern questionnaires were identified. After removing these, 411 questionnaires were used for the analysis, representing 85.6% of the total surveys sent. The procedures followed in analyzing the initial research data included a series of procedures employing SPSS and AMOS software. First, the validity and reliability of the instrument used in data collection were measured through CFA. Another vital function of CFA is to ensure that the items used in structural equation modelling are precise, reliable, and free from measurement error. Moreover, structural equation modelling (SEM) was applied to evaluate the research hypotheses. It comprises confirmation concerning the construction validity of the structural model applied in testing the hypotheses utilizing goodness-of-fit measures. In addition, extracting path coefficients that illustrate the impact of AI applications on HR productivity challenges through employees' technical expertise.

4. Results

The results of the CFA are presented in Table 1. This test provides an expanded view of the extent to which the scale achieves appropriate proportions of validity, both convergent and discriminant, in addition to confirming the scale's reliability.

Table 1
Result of confirmatory factor analysis.

Constructs	Items	Loadings	AVE	MSV	√AVE	CR
AI Applications	AIA1	0.725	0.516	0.395	0.719	0.864
	AIA2	0.634				
	AIA3	0.771				
	AIA4	0.703				
	AIA5	0.792				
	AIA6	0.674				
Employee Technical Expertise	ETE1	0.751	0.527	0.418	0.726	0.816
	ETE2	0.716				
	ETE3	0.738				
	ETE4	0.697				
HR Productivity challenges	HRP1	0.772	0.596	0.467	0.772	0.855
	HRP2	0.816				
	HRP3	0.764				
	HRP4	0.733				

The results of Table 1 indicated that the loading factors of the AI application items were between 0.634 and 0.792. The loadings of the employees' technical experience Expertise items were within the range (of 0.697-0.751), and the loadings of the HR productivity challenges items were within the range of (0.733-0.816). The results show that all items meet the minimum threshold of 0.50 and are suitable for measuring their underlying constructs. The convergent validity of the research constructs was evaluated using the average variance extracted (AVE). The results of AVE indicated that the value for each AI application, the employees' technical experience, expertise, and HR productivity challenges were 0.516, 0.527, and 0.596, respectively. The values of AVE that exceed the minimum threshold of 0.50 are considered evidence of the convergent validity of the research instrument. The discriminant validity was assessed using a two-way comparison method. The Average Variance Extracted (AVE) was initially compared to the latent constructs' Maximum Shared Variance (MSV). The findings indicated that all AVE values surpassed the MSV values, indicating discriminant validity. This outcome was further confirmed by comparing the square root of the AVE values to the correlation coefficients by the Heterotrait-Monotrait Ratio of Correlations (HTMT). The results proved that the square root of the average variance extracted (AVE) values was more important than the correlation coefficients between the constructs. This validates the distinctiveness of the research tool. In addition, McDonald's Omega coefficients were utilized to verify the constructs' composite reliability (CR). The coefficients exceeded the minimum threshold of 0.70, confirming the composite reliability of the research constructs.

As depicted in Fig. 2, a structural model was constructed to elucidate the mediating role of employees' technical expertise in the relationship between AI applications and HR productivity challenges. This statistical approach clarifies the intricate relationship between latent variables by highlighting direct and indirect effects.

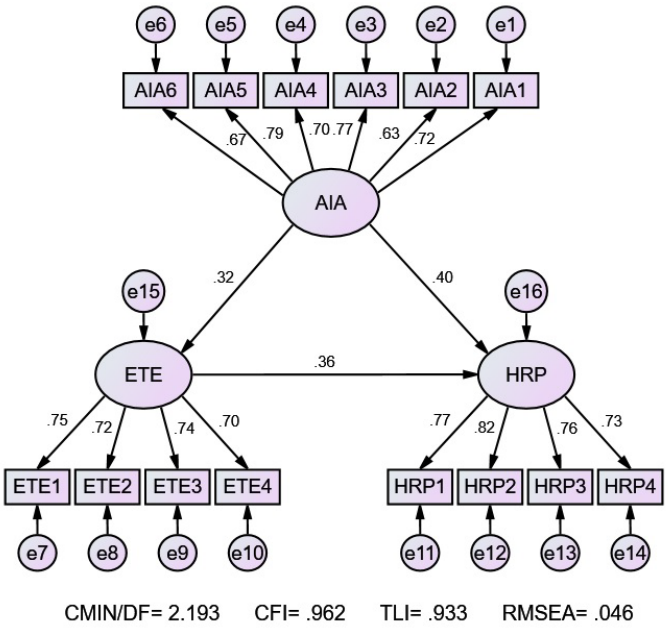

Fig. 2. Structural model for the impact of AIA on HRP through ETE

The information presented in Fig. 2 shows the fit indices used to evaluate the structural accuracy of the model utilized in the study. The CMIN/DF ratio was 2. 193, suggesting that it meets the suggested fit standard of being less than three, as stated by previous studies. The comparative fit index (CFI) and Tucker-Lewis index (TLI) were 0.962 and 0.933, respectively. These values, surpassing 0.90, indicate a strong fit between the chi-square of the hypothesized model and the independent model. The RMSEA was 0.046, which is above the specified minimum threshold of 0.08 in references 71 and 72. Based on the goodness-of-fit indices, the structural model employed to measure the impact of AI applications on HR productivity challenges through employees' technical expertise is deemed appropriate. Consequently, path coefficients were calculated to evaluate the hypotheses and ascertain the direct and indirect effects, as detailed in Table 2.

Table 2
Testing the mediation role of ETE on the relationship between AIA and HRP

	Direct		Indirect		Total			
	B	**β**	**B**	**β**	**B**	**β**	**S.E.**	**T**
AIA → HRP	0.426	0.398			0.426	0.398	0.053	8.04***
AIA → ETE	0.351	0.322			0.351	0.322	0.064	5.48**
ETE → HRP	0.373	0.361			0.373	0.361	0.067	5.57**
AIA → ETE → HRP	0.426	0.398	0.131	0.116	0.557	0.514	0.060	9.28***

Note: * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$.

The results depicted in Table 2 above indicate that out of the five correlation coefficients calculated, only the standardized effect coefficient β = 0.398, indicating that there is a direct positive correlation between the two variables. This conclusion was also supported by a t-value of 8.04 and a p-value less than 0.001. Further, the standardized effect coefficient β for testing the hypothesis that the application of AI in organizations influenced the technical skill level of the employees was 0.322, indicating that the proposed hypothesis of a positive relationship between the independent and the mediating variables was valid. This result was backed by a t-value of 5.48 and a p-value less than 0.01. Similarly, the standardized effect coefficient β for the connection between employees' technical expertise and HR productivity challenges was 0.361, validating the positive relationship between the mediating and dependent variables. This was also supported by a t-value of 5.57 and a p-value less than 0.01. Furthermore, the standardized effect coefficient for the indirect relationship between AI applications and HR productivity via employees' technical expertise was 0.116. This indirect influence accounted for a total standardized effect coefficient of 0.514 with an improvement in the t-value to 9.28, and in terms of statistical significance, the results derive a p-value less than 0.001. Therefore, it can be concluded that employees' technical expertise partially mediates the link between applications and HR productivity.

5. Discussion and Conclusion

Artificial intelligence applications (AIA) produce a positive effect on HR productivity challenges (HRP) by interplaying the mediating role of employees' technical expertise (ETE) in the sector of the service industry. HR productivity challenges were the essential purpose of investigating the impact of Artificial intelligence applications through employees' technical expertise to decrease challenges and find a balance between the employees' skills and AI Apps implementation instead of replacing HR skills (Al Naqbi et al., 2024).A sustainability HR approach leads to long-run benefits for organizations, including the ability to track current and future technological innovation over time by skilled employees (Kutieshat & Farmanesh, 2022). Consequently, the present paper's outcomes of all hypotheses are shown to support the results of previous studies. The first hypothesis proposed the positive link between Artificial intelligence applications and productivity challenges in the HR sector of the service industry., which is related to the conclusions of studies (Hassan, 2024; Benbya et al., 2020; Presbitero & Teng-Calleja, 2023; Paluch& Wirtz, 2020; Talpur et al., 2021). The mediating role of employees' technical expertise in the HR sector of the service industry in hypothesis 2 (H_2) harmonizes past articles on artificial intelligence applications and their effect on human resource productivity challenges, which is related to the conclusions of studies(Hassan, 2024; Benbya et al., 2020; Saengrith et al., 2022; Frey et al., 2016; Billett, 1995); to get the balance with performing Problem-Based Learning (PBL) theory (Gallagher, 1997; Kivela & Kivela 2005; Lambros, 2013).

5.1. Managerial Implications

This paper focuses on the service sector in Jordan managerially to overcome the dilemmas facing employees and HR managers and the speedy implications of AI applications. The examiners found that the use of Artificial intelligence applications had a favorable direct effect on productivity challenges in HR, and by the indirect effect of the mediating role of employees' technical expertise in the sector of the service industry, the challenges decreased; the mediator is necessary to determine better implications of AI managerial practices and getting the balances with employees skills performance, and this is deemed new implications in the service sector through the industry. Eventually, corresponding to earlier studies, this study sheds light on a new aspect of investigating the challenges HR professionals face by examining the indirect effect of employees' technical expertise as a mediator for addressing expected AI risky implications. HR managers could perform the current findings to help and gain balance with the employees' skills instead of replacing their competencies with artificial intelligence applications by improving their technical capacities.

6. Limitation and Future Researches

The current research limits the investigation within the Jordanian service sector industry; the HR sector should promote strategies to balance AI skills and human skills. This will reduce HR professionals' concerns about the rise of AI apps. Training sustainability is crucial and considered to follow the era of innovations and advancements. Also, it is essential to think about new skills and competencies regarding the organization's strategy to cope with acquiring the employee's multitasking and new innovative skills.

The present analysis limits the investigation to a specific service sector industry in a single location in Jordan; future studies can be conducted in other sectors (Public and Private) as a comparative analyze, and examine the relationship between the three components: AI Apps, HR productivity challenges, and employees' technical expertise; as AI Apps innovate and evolve to new contexts over time.

Besides, it will be interesting to explore the impact of introducing a “Moderator” into the relationship mentioned above: the telecommuting work shift for young specialized employees with AI skills working in organizations. This aspect could be examined to determine whether it alleviates HR productivity challenges, risks and enhances the equilibrium between AI and human skills rather than solely focusing on replacing employees' skills.

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