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Research Article

Adapting AI Innovation Processes to Improve Job Performance: Empirical Evidence from Jordanian information technology Sector

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ABSTRACT

In recent years, artificial intelligence has received considerable attention in business, particularly in information technology Sector, due to its potential to enhance employee performance. However, there are still implementation challenges to overcome. This study aims to examine impact of Artificial intelligence and its associated variables (experience system, neural networks, genetic algorithms, and intelligence agents) on job performance. A total of 367 employees from Jordanian information technology firms were surveyed. Smart PLS 4 was used for data analysis. The results indicated a significant positive relationship between artificial intelligence and job performance, moderated by organisational support. As part of its efforts to mitigate challenges related to artificial intelligence, organizations are encouraged to support employees during these transitions. It acts as a starting point for future research projects on the various impacts of artificial intelligence, guiding organisational actions as they interact with this artificial intelligence -driven changes, while striking a balance between technological advancements and human interests.

Keywords: experience system, neural networks, genetic algorithms, intelligence agents, Jordan, IT sector.

INTRODUCTION

Artificial intelligence is playing a crucial role in transforming industries across the globe by influencing various business domains, including information technology Sector. Particularly Artificial intelligence innovation processes help reshape the ways tasks are performed, decision are made and businesses operate. Provided that the Artificial intelligence is potentially beneficial, there are significant challenges for job performance and workforce dynamics. The more the organizations are integrating Artificial intelligence to increase operational efficiency, the more the concerns about its impact on employees in terms of job displacement and evolving role expectations are becoming central to understanding the future of work.

The purpose of the study to examine impact of artificial intelligence on job performance in Jordan's information technology sector, which likes other developing economies, is experiencing a technological transformation fuelled by artificial intelligence. With increase in adoption of Artificial intelligence by many companies, the way the employees perform different tasks, interact with technology and their productivity are shifting rapidly. The scientific problem which actually leads to perform this study is the need to understand how Artificial intelligence innovation affects job performance in the countries like Jordan. The information technology sector in Jordan is not only a driver of economic growth but also is a domain of technological disruption. The current study tries to explore

how artificial intelligence -driven processes impact employee productivity, skill adaptation and overall efficiency of organization. Hence positioning the study as an intersection of technology adoption and workforce dynamics.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Artificial intelligence offers significant potential to enhance accuracy, productivity, and profitability in business operations (Brynjolfsson et al., 2018; Chen et al., 2024). In addition, many people view the evolution of artificial intelligence as a risk rather than a tool for improving themselves, as they fear that it will create machines and robots to replace them. The use of artificial intelligence in all departments within large companies benefits them by reducing project and task costs, eliminating redundant personnel, and achieving innovative outcomes (Justice-Amadi & Orokor, 2022). As a result of artificial intelligence awareness, employees recognise that jobs may be replaced in the future by automated machines, such as robots and algorithmic management (Ljungholm & Popescu, 2023; Alsakarneh et al., 2023). artificial intelligence awareness among employees is evaluated based on their perceptions of whether technologies like artificial intelligence and automation could potentially replace their jobs, careers, or professional activities (Brougham & Haar, 2020; Toumia & Zouari,2024). As a consequence of artificial intelligence awareness, employees are under higher stress, and their jobs are insecure (Lingmont & Alexiou, 2020). Despite this issue, employee job performance is negatively related to job insecurity, reducing their self-efficacy and career-related self-management (Shin & Hur, 2021; Alsakarneh et al., 2023). Employees who feel threatened by environmental changes within the organisation may feel uncertain about their jobs. Employees could protect their professional competencies by preventing their work from being replaced by artificial intelligence if they feel that the application of artificial intelligence might affect their use of artificial intelligence at work. One may experience anxiety concerning possible losses of resources, yet such concerns can enhance personal abilities and adaptation to new professional qualification requirements (Wang et al., 2019 ; Alsheikh et al .,2021).

A comprehensive job performance measure assesses various employee behaviours and results and their interpersonal, learning, and innovation performance (Alsakarnch & Hong 2015; He et al., 2023). In IT organisations, as employees begin to experience the substitution effects of artificial intelligence on the job market, the skill requirements for new job positions will increase (Zhang, 2019) as more high-skilled jobs are created. The impact of increasing productivity on workers' salaries and employment opportunities may lead to job loss if they are not adequately compensated for their existing skills (Acemoglu & Restrepo, 2019). In order to reduce the pressure caused by artificial intelligence on employees, they should recognise their long-term employability to reduce the work pressure caused by artificial intelligence (Mingshu & Zixuan, 2020). Improving learning performance will further enhance interpersonal and innovation performance, thereby improving the employee's overall work performance (Lejeune et al., 2021). Figure 1 depicts the study's conceptual model.

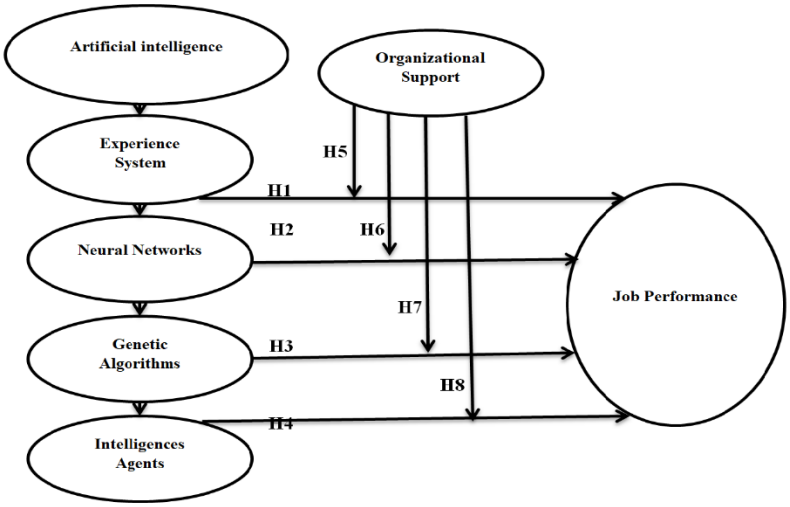

Figure 1: Research Model

The application density of artificial intelligence and intelligence degree remains low when artificial intelligence is implemented at its first deployment stage in IT organisations. As the use of artificial intelligence expands, its intensity grows, and employees' personal resources play a crucial role in managing the substitution effect of

artificial intelligence during learning; the use of artificial intelligence negatively impacts employees' work performance at this stage. Nevertheless, artificial intelligence also generally impacts employee performance positively. If artificial intelligence possesses a higher level of intelligence, usage density, and learning ability than employees, it will outperform them in learning tasks. The effectiveness of artificial intelligence cannot be achieved by resource investment, as its learning ability is better than employees (Saxena et al., 2023; Alsakarneh et al., 2023).

Employees' beliefs about their workplace are largely influenced by how much they feel trusted, appreciated, and cared for by their organization. When they think about the support they receive, it often comes down to whether the organization truly values their well-being and acknowledges their efforts (Rhoades & Eisenberger, 2002). As stated earlier, using artificial intelligence can cause job insecurity in employees. Hence, organisations must provide their employees with support and relevant resources (Lestari et al., 2023; Gayathri & Bella ,2024). In order to increase organisational support, improve employee wellbeing, and expand artificial intelligence utilisation, providing employees with a supportive work environment, manageable workload, and greater autonomy is necessary. In addition to improving work performance, employee satisfaction and negative consequences caused by robots can be predicted and mitigated (Li et al., 2021; Makhamreh et al., 2022).

One of the first strategies to achieve work-life balance is the perception of organisational support received by employees, drastically reducing employees' stress levels. Employees' job insecurity is also reduced by adequate financial compensation. Organisational support, encompassing aspects such as fairness, training, independence, and good working conditions (Duke et al., 2009; Alsakarneh et al., 2023), has been shown to improve employee performance, addressing the growing need for such support (Zhao & Wang, 2021; Alsakarneh et al., 2021). It has been demonstrated that employees are less likely to suffer from psychological distress and burnout when employees feel that their organisation support them (Arogundade et al., 2015). Employees who are well-supported by their organisations are more likely to be productive, satisfied and give their best effort. Such support systems include fairness, training, autonomy, rewards, and stress management mechanisms, which enhance employees' sense of control and reduce their overall stress levels (Duke et al., 2009; Alsakarneh et al., 2019).

Employees who are provided with organisational support will be able to cope with stressful situations and perform their duties professionally (Chiang & Hsieh, 2012). Perceived organisational support in the workplace can enhance employee wellbeing, improve work safety, and make employees feel satisfied, enabling them to work in a supportive environment, manage their workloads, and increase their autonomy (Alsakarneh et al., 2024). It can also help mitigate the effects of implementing artificial intelligence and robotics in the workplace, allowing employees to predict and reduce their negative effects (Amadi-Iwai et al., 2024). This supportive work environment has been proven to promote employee satisfaction, reducing the likelihood of employee turnover (Bhargava et al., 2021; Chen et al., 2022).

Conclusively the above literature review documents the positive as well as negative implications of artificial intelligence adoption on job performance. While artificial intelligence can lead to job insecurity and negatively affect the job performance it can also enhance productivity and innovation within the organization. Organizational support emerges as a key moderating factor that can alleviate the negative impacts of artificial intelligence on employees. The purpose of study to explore how technologies like experience systems, neural networks, genetic algorithms and intelligence agent impact job performance. Moreover, it tries to investigate the intervening role of organizational support in moderating the said relationships. Hence the following hypotheses are formed:

H1: Experience system has a direct and significant effect on improving job performance.

H2: Neural networks have a direct and significant effect on improving job performance.

H3: Genetic algorithms have a direct and significant effect on improving job performance.

H4: Intelligence agents have a direct and significant effect on improving job performance.

H5: Organisational support positively moderates the relationship between the experience system and job performance.

H6: Organisational support positively moderates the relationship between neural networks and job performance.

H7: Organisational support positively moderates the relationship between genetic algorithms and job performance.

H8: Organisational support positively moderates the relationship between intelligence agents and job performance.

METHODS

Participation in the study's survey was limited to Jordanian employees of large IT organisations. The study's participants are daily users of technology devices and systems in Jordanian IT organisations. The respondents were selected using a sampling method, where they were individually or in small groups contacted by the department head when available. Subsequently, primary data was collected through distributed questionnaire surveys and analysed quantitatively. The relationship between artificial intelligence adoption and job performance was examined with the assistance of the questionnaire developed after conducting a thorough literature review. A total of 400 questionnaires were distributed, but only 380 were returned. Out of the 380 completed questionnaires, 367 were considered useful. In order to test for causal relationships within the data, structural equation modelling (SEM) and correlated measures were utilised. Additionally, SEM ranks measurements in priority order by considering their unknown reliability.

Based on the existing literature, the scales were modified to suit the study's context. The artificial intelligence variables were measured using an instrument developed by Ajam (2018) and Abusalma (2021), tailored to better suit enterprises involved in IT. This instrument comprises 15 items, all measured using five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). Job performance was assessed using three items adapted from previous studies (Ajam, 2018; Bikeev et al., 2019) and modified to align with the specific context of IT organisations. Job performance was measured using a five-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5). In addition, five measures from prior studies were adapted to measure organisational support (Eisenberger et al., 1986; Shanock & Eisenberger, 2006) and modified to suit the examined IT organisations. Organisational support was measured using a five-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5).

RESULTS

The PLS modelling techniques were employed by utilising the SmartPLS 4 version (Ringle et al., 2005) as a statistical tool to test both the measurement and structural model. This choice was made since PLS does not assume normality applied in survey research, which is often not used in survey research where data are typically non-normally distributed (Chin et al., 2003). The proposed study used structural equation modelling to test the specified relationships.

The analysis was undertaken in two stages. First, a measurement model was implemented to ensure the model's validity. The convergent and discriminant validity was tested to determine the reliability. Convergent validity is defined as the manifestation of a latent variable by its specific items (Hair et al., 2017; Ngah et al., 2019). Nevertheless, the second step of the structural model involved validating the proposed hypotheses after ensuring practicality and obtaining sufficient results from initial testing.

The average variance extracted was calculated to assure that convergent validity. Moreover, composite reliability was also insured. The minimum thresholds are 0.5, 0.5 and 0.7 for factor loading, AVE and CR respectively. As it can be noticed in the table that all loadings are above the suggested value of 0.5 (Hair et al., 2017) see table 1. Table 2 indicates that all values are with the given range of AVE and CR as per (Hair el al., 2017). Hence the convergent validity is confirmed.

All factor loadings are presented in Table 1. Firstly, all loading values exceed the recommended value of 0.5 (Hair et al., 2017). Table 2 confirms the recommended AVE and CR values provided by Hair et al. (2017). Therefore, the convergent validity of the model is guaranteed.

Table 1: Factor Loading

	ES	IA	IS	JP	NN	OS
ES1	**0.883**					

ES2	**0.901**					
ES3	**0.876**					
ES4	**0.903**					
IA1		**0.927**				
IA2		**0.950**				
IA3		**0.920**				
IA4		**0.898**				
GA1			**0.976**			
GA2			**0.976**			
GA3			**0.979**			
JP1				**0.949**		
JP2				**0.901**		
JP3				**0.907**		
NN1					**0.872**	
NN2					**0.923**	
NN3					**0.946**	
NN4					**0.948**	
OS1						**0.937**
OS2						**0.939**
OS3						**0.937**
OS4						**0.957**
OS5						**0.953**

Table 2: Cronbach's Alpha, Composite Reliability, and Average Variance Extracted

	Cronbach's Alpha	CR (rho_a)	CR (rho_c)	AVE
ES	**0.914**	**0.920**	**0.939**	**0.794**
IA	**0.943**	**0.955**	**0.959**	**0.854**
GA	**0.976**	**0.989**	**0.984**	**0.954**
JP	**0.908**	**0.912**	**0.943**	**0.846**
NN	**0.942**	**0.960**	**0.958**	**0.851**
OS	**0.970**	**0.970**	**0.976**	**0.892**

In the next step the HTMT was used to assess the discriminant validy (Henseler et al., 2015) and further developed by Franke and Sarstedt (2019). The values of HTMT were all below the suggest highest value 0.90 which can be noticed in the table 3. Hence it is concluded that the respondents categorised the constructs as distinct dichotomies. Hence the reliability and validity were found to be up to mark.

Table 3: Discriminant Validity (HTMT)

	ES	IA	GA	JP	NN	OS
ES						
IA	**0.037**					
GA	**0.057**	**0.047**				
JP	**0.224**	**0.139**	**0.157**			
NN	**0.133**	**0.033**	**0.031**	**0.140**		

OS	**0.211**	**0.152**	**0.129**	**0.158**	**0.110**

Structural Model

The p-values were generated using bootstrapping. Table 4 presents the results of hypotheses testing for direct relationships and moderation analysis. The direct p-values of the relationships are presented in Table 4. The results revealed that the experience system insignificantly affects job performance (p-value = 0.086). In contrast, neural networks strongly and positively impact job performance (p-value = 0.018). Genetic algorithms significantly and positively impact job performance (p-value = 0.029). Nevertheless, intelligence agents do not significantly (p-value = 0.416) affect job performance. In terms of moderation, organisational support moderated the effect of neural networks on job performance, yielding a p-value of 0.07. Additionally, the moderating effect of organisational support on intelligence agents and job performance is supported by a p-value of 0.04.

Table 4: Hypotheses Testing

	Beta	**Se**	**t-values**	**p-values**
ES -> JP	**0.029**	**0.022**	**1.365**	**0.086**
IA -> JP	**-0.005**	**0.021**	**0.213**	**0.416**
GA -> JP	**0.037**	**0.020**	**1.894**	**0.029**
NN -> JP	**0.046**	**0.022**	**2.099**	**0.018**
OS x NN -> JP	**0.049**	**0.020**	**2.472**	**0.007**
OS x IA -> JP	**0.055**	**0.020**	**2.675**	**0.004**
OS x GA -> JP	**0.003**	**0.019**	**0.181**	**0.428**
OS x ES -> JP	**0.055**	**0.018**	**2.985**	**0.001**

DISCUSSION

This study explored different artificial intelligence components to determine their impact on job performance. Furthermore, organisational support was investigated as a moderator in the relationships. A detailed discussion of the findings is presented below.

H1: Experience System and Job Performance

The experience system shows a non-significant effect on job performance (p = 0.086). This finding is consistent with the viewpoint that the experience system is among the methods of solving issues that require the use of specialised knowledge and skill (Chukwudi et al., 2018). The absence of a direct correlation between experience system and job performance emphasises the importance of differing circumstances in which an employee's emotional intelligence can serve as an additional instrument in fulfilling organisational tasks.

H2: Job Performance and Neural Networks

Neural networks strongly and significantly affect job performance (p-value = 0.018). This finding aligns with findings in prior literature concerning the ability of neural networks to learn and solve complex problems (Shaw et al., 2019). The strong correlation between neural networks and job performance indicates that they have a broad range of applications, ranging from handwriting recognition to oil exploration.

H3: Genetic Algorithms and Job Performance

A typical example of the application of artificial intelligence to mathematical simulations is genetic algorithms, which help produce better results than before in an easy, natural and parallelised way. The present study does not directly address the specific effect on job performance. Nevertheless, other relevant literature argues that genetic algorithms lead to advanced procedures and better answers (O'Brien 200 Portland). At a conceptual level, genetic algorithms are an evolutionary technique with problem-solving methods derived from biological processes.

H4: Intelligence Agents and Job Performance

Unlike other artificial intelligence applications, intelligence agents have minimal influence on job performance (p-value = 0.416). The absence of a direct relationship implies that knowledge-based experience within the information systems may not necessarily lead to better work performance. This result merits careful consideration regarding the specific organisational tasks used by artificial intelligence (Petropoulos, 2018).

H5: Organisational support positively moderates the relationship between the experience system and job performance.

The results show no significant relationship between the experience system and job performance (p-value = 0. 086). These findings align with conceptualising experience systems as problem-solving tools requiring specialised knowledge and skill (Chukwudi et al., 2018). The lack of a straight-line relationship highlights the need to examine the contextual factors that facilitate or hinder experience system integration within organisational structures.

H6: Organisational support positively moderates the relationship between neural networks and job performance.

Neural networks have a highly positive effect on job performance (p-value = 0.018). These findings align with the literature focusing on the learning capabilities of neural networks and their ability to solve complex problems (Shaw et al., 2019). The moderation analysis adds to the findings by highlighting the importance of organisational support in helping maximise the beneficial impact of neural networks on job performance (p-value = 0.007).

H7: Organisational support positively moderates the relationship between genetic algorithms and job performance.

Genetic algorithms positively impact job performance (p-value = 0.029). It is also part of the larger story that artificial intelligence will enhance organisational effectiveness and competitiveness (Justice-Amadi & Orokor, 2022). Consistent with the above notion of catalyst, the moderation analysis revealed that organisational support strengthens this relationship (p-value = 0.004).

H8: Organisational support positively moderates the relationship between intelligence agents and job performance.

Unlike other artificial intelligence applications, intelligence agents do not significantly impact job performance (p-value = 0.416). The indirect relationship implies that knowledge-based experience systems may exist within the information systems framework. Nevertheless, it is not necessarily true that these advancements will result in better job performance. This outcome calls for careful analysis of the specific environment in which intelligence agents operate within organisational workflows (Petropoulos, 2018).

The present study offers a general analysis of the effects of different artificial intelligence applications on job performance. Neural networks and IS have positive relationships, while the impact of experience systems and intelligence agents is insignificant. Thus, organisations must carefully consider the specific application functions within their operations to make fully informed decisions about deploying artificial intelligence systems.

Conclusion

The purpose of this study is to examine the impact of artificial intelligence on job performance and its associated variables. This study provides a nuanced understanding of the impact that artificial intelligence has on job performance, emphasizing the crucial role of organizational support in the process. Neural networks and genetic algorithms were shown to have a positive effect, while intelligence agents showed limited impact. Organizations must consider how to support employees during artificial intelligence -driven transitions to ensure a positive outcome. Future research should explore additional artificial intelligence components and industry-specific variations to further refine these findings.

The findings of this study highlight the importance of organisational support, which has been established through previous research on perceived organisational support. Nevertheless, understanding the complexities of such dynamics goes beyond awareness as organisations face numerous challenges in artificial intelligence implementation. This understanding lays a road map for developing an environment compatible with artificial intelligence revolutionism without compromising the human population's welfare and job satisfaction. In essence, this study provides a starting point for future research projects on the various effects of artificial intelligence, guiding organisational actions as they interact with this artificial intelligence -driven changes, aiming to strike a balance between technological advancements and human interests.

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