The Mediating Role of AI Integration in Enhancing Job Efficiency through HRM Practices in Jordanian food, beverage, and livestock Industrial Companies

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Abstract

This research aims to investigate the impact of the integration of AI in HRM practices on job efficiency within the Jordanian industrial firms with the help of the Technology Acceptance Model (TAM), and specifically looks into the mediating effect of perceived ease of use, perceived usefulness, and managerial attitudes. A survey of 338 respondents was conducted based on the minimum sample size of 153 firms, and the data were analyzed with SmartPLS4 software. The research indicates that although perceived ease of use and usefulness increase the perceived benefits of AI in relation to job efficiency, managerial perceptions do not influence this result. The study concludes by offering suggestions on improving perceptions and preparedness for AI use in HRM for Jordanian companies.

Keywords: AI Integration, Job Efficiency, Human Resource Management, Technology Acceptance Model.

1. Introduction

Nowadays, technology such as artificial intelligence (AI) plays a critical role in reshaping competitive dynamics and transforming industries. AI is defined as a collection of models and methods utilized to mimic human intelligence that is considered a critical instrument for modern organizations (Taguimdje et al., 2020; Surve, 2020). A variety of organizations across several sectors uses AI technology. Therefore, AI becomes as a strategic resource that can promote job efficiency (Lohapan, 2021). Within Jordanian context, AI plays a critical role in enhancing job efficiency in human resource management (HRM) (Yousuf et al., 2019; Alrfai et al., 2023).

The incorporation of AI into HRM practices alters the organizations' methods in managing their human resources significantly. In this respect, Bhatt & Shah (2023) indicates that AI is used to serve various HR functions. These include recruitment, employees' retention, training, and development. Moreover, Tambe et al. (2019) argue that AI improves the strategic roles of HR professionals. In Jordan, the integration of AI is considered as an opportunity and as a challenge due to the impact of social, religious, and cultural factors that have a significant impact on HRM practices (Madanat & Khasawneh, 2018). Besides, the high-tech companies in Jordan that adopt

AI tend to improve their HRM practices and job efficiency (Abu-Khaled, 2020; Al-Habashneh, 2023).

This study is concerned with the impact of AI on enhancing job efficiency. Anwar & Abdullah (2021) defines job efficiency as a multifaceted notion, which combines several criteria like adaptability to environmental changes, profitability, and sustainability. The job efficiency in Jordan is affected by national cultural values that articulate HR practices and policies (Abusalma, 2021). Vrontis et al., (2023) point out that AI promotes job efficiency among the industrial companies in Jordan. Its role is manifested in improving decision-making processes, transforming operational efficiencies, and fostering innovation. However, a strategic approach should be used among HR professionals to guarantee the successful incorporation of AI into HRM practices. Goswami et al. (2023) indicate that this strategic approach should align with organizational culture and readiness along with addressing potential skill adaptation challenges.

This study seeks to investigate the impact of AI integration in enhancing HRM practices in the food and beverage industry in Jordan as well as agriculture and livestock. The study expects that using AI applications in these sectors will promote customer service, quality control, and operational efficiency (Al-Surmi et al., 2022). Moreover, the incorporation of AI in HRM practices among such sectors are pivotal in promoting job efficiency by improving workforce management and streamlining HR processes (Bataineh & Qasim, 2023). However, using AI in such industries might constitute challenges that are manifested in the need for specialized talent and high implementation costs (De Oliveira et al., 2021; Brooks et al., 2022).

This study aims to investigate the effect of AI on enhancing the job efficiency in the food and beverage, agriculture, and livestock industrial sector in Jordan. To this end, the study aims to distribute a questionnaire to the managers operating in these industries. It further aims to adopt technology acceptance model as a theoretical framework to analyze the data.

1.1 Problem Statement

AI-infused HRM transforms organizational operations. Nevertheless, its contribution to job efficiency improvement in the food and beverage, agriculture, and livestock industrial sectors in Jordan is not well investigated yet. AI could facilitate operational efficiency and employee engagement, however, its effects on job efficiency in the Jordanian context are not completely dealt with (Adnan et al., 2016; Anwar and Abdullah (2021). Several studies (Yawalkar, 2019; Johansson & Herranen, 2019) indicate that using AI in HRM practices is hampered by several reasons; including regulatory compliance, ethical concerns, and employee adaptability What so more, Sewada et al. (2004) recommend effective integration and reducing biases when utilizing AI. The literature lacks a comprehensive understanding of the impact of AI on HRM methods and overall performance in the Jordanian food and beverage, agriculture, and livestock industrial sector, despite its global recognition for anticipating and automating HR processes. Thus, it underscores an understanding of how such advancements can be designed to suit the industrial landscape in Jordan (Johansson & Herranen, 2019; Tambe et al., 2019). Based on these limitations, there is a dire need to carry out a study that examinees the advantages of AI integration in HRM practices and its subsequent influence on improving job efficiency in Jordan. Such study seeks to fill this gap by investigating the effectiveness of utilizing AI in Jordanian

industrial companies to improve performance, while maintaining transparency, human-centric approaches, and fairness (Yawalkar, 2019; Khatri et al., 2019; Johansson & Herranen, 2019).

1.2 Research Questions

This seeks to answer the following research questions:

RQ1: How does the perceived ease of use influence job efficiency in Jordanian food and beverage, agriculture, and livestock industrial companies?

RQ2: What impact does the perceived usefulness have on attitudes towards using AI in HRM practices in Jordanian food and beverage, agriculture, and livestock industrial companies?

RQ3: In what ways do managerial attitudes towards using AI mediate the relationship between perceived ease of use and job efficiency in Jordanian food and beverage, agriculture, and livestock industrial companies?

RQ4: What is the Positive Impact of AI Integration into HRM Practices on Job Efficiency?

RQ5: How Does AI Integration into HRM Practices Mediate the Relationship Between the Perceived Usefulness of AI Adoption and Job Efficiency?

RQ6: How Does AI Integration into HRM Practices Mediate the Relationship Between the Perceived Ease of Use and Job Efficiency?

RQ7: How Does AI Integration into HRM Practices Mediate the Relationship Between Managerial Attitude and Job Efficiency?

1.3 Significance of the Study

This research has practical and theoretical significance concerning AI incorporation in HRM in food and beverage, agriculture and livestock industrial sector in Jordan. From a theoretical standpoint, the study contributes to the body of knowledge. It investigates brand new dimensions of AI application; Among them, ease of use, perceived usefulness and AI as strategic resource. It further investigates the complicated interaction among peer influence on adopting AI, managerial attitudes, and organizational culture. This study addresses how such interaction improves organizational change and technology management in Jordan. From a practical aspect, policymakers and industry practitioners will benefit from this study by determining key aspects that hinder or facilitate AI incorporation in HRM.

2. Theoretical Framework

Fred Davis in 1989 proposed The Technology Acceptance Model (TAM). It examines the consumers' attitudes and perceptions towards using and adopting technology (Davis, 1989). TAM focuses on two factors; the first one is perceived utility, which means users' opinions towards employing technology to improve their performance. The second factor is perceived ease of use, which means the users' perspectives regarding the easiness of using technology. Both factors have a positive impact on users' intentions regarding using technology and their actual usage behaviour of technology. TAM is applied in a variety of contexts; including,

education, business, healthcare, and government to predict and understand users' adoption and acceptance of technology.

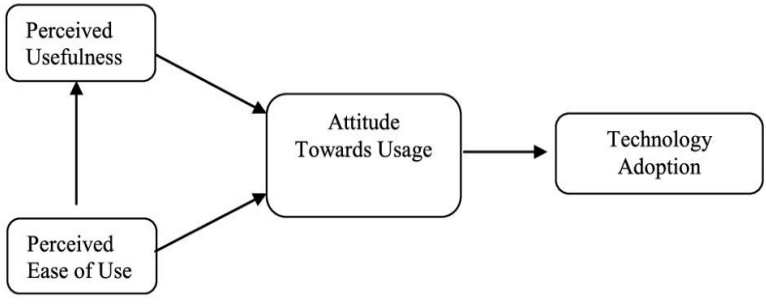
According to Davis (1989), perceived usefulness is related to the users' perception regarding the role of technology in improving their job performance. As for the perceived ease of use, it means the users' belief regarding the easiness and simplicity of using technology. Both perceived usefulness and perceived ease of use determine users' acceptance towards using technology.

In this study, perceived usefulness means the degree to which AI is used to improve HRM practices' performance. AI tools can be perceived as useful if they enhance strategic human resource outcomes, efficiency, and decision-making. When AI tools are perceived as useful, their adoption and integration in the organization will be increased. To support this claim, Davis (1989) claims that the behavioral intention of users to utilize technology is considerably affected by the perceived usefulness of technology in enhancing job performance.

As for perceived usefulness, the researcher refers to the extent to which potential users depict technology as an easy instrument that facilitates their job. It can be inferred that perceiving AI tools to be user-friendly and require minimal technical knowledge and a learning curve, they are more likely to be adopted by HR personnel.

The pillars of TAM are illustrated in Figure (1) below:

Figure (1) Technology Acceptance Model



(Source: Davis, 1989)

Using TAM enables us to perceive the effectiveness of using AI in HRM practices. In this study, the researcher seeks to evaluate if the ease of implementing AI in Jordan's food , beverage and livestock industrial companies influences its adoption. As a consequence, this theory is applied to answer the research questions. To elaborate, it is adopted to investigate the perceived ease of use of AI influences job efficiency in Jordanian food , beverage and livestock industrial companies (RQ1). It is further applied to examine the perceived usefulness of AI on attitudes towards using AI in HRM practices in Jordanian industrial companies (RQ2). It is also applied to investigate managerial attitudes towards using AI, which mediates the relationship between perceived ease of use and job efficiency in food , beverage and livestock Jordanian industrial companies (RQ3). In a nutshell, this study seeks to apply TAM to investigate how ease of use alters the outcomes via AI integration.

TAM is fundamental in predicting and understanding how users use and accept new technology. It provides critical insights into the acceptance and usefulness of integration AI in HRM practices.

3. Hypotheses Development

In this paper, three hypotheses were developed to examine the complex relationships between AI integration in HRM practices as illustrated below:

3.1 Perceived Ease of Use positively influences Job Efficiency in Jordanian food , beverage and livestock Industrial Companies

The explored literature shows that the perceived ease of use of AI has a direct impact on job efficiency in Jordanian industrial firms. AI applications can be used to assist in the engagement of employees, the decision-making process, and even the hiring process which in turn improves the operation and functioning of HRM (Singh et al., 2020; Zhu, 2021). The ease of use of AI systems increases the chances of employees utilizing these tools optimally and thereby increases job productivity. AI has become integrated into HRM practices to ease complexities in determining causes and outcomes while reducing the timelines of routine HRM activities as well as product customization to suit the employees (Baldegger et al., 2020; Budhwar et al., 2022). However, incorporating AI with the right organizational support structures will go a long way in enhancing the ease of use of this emerging technology hence enhancing its adoption which in turn will enhance efficiency in the functioning of the HRM organization. This favours the argument made by Li et al. (2023), who further assert that AI improves decision-making and operational effectiveness in the management of human capital, especially when it is easy to use and can blend into existing organizational systems. Therefore, based on the evidence from these studies, it can be hypothesized that:

H1: Perceived Ease of Use positively influences Job Efficiency in Jordanian food , beverage and livestock Industrial Companies.

3.2 Perceived Usefulness positively impacts Attitudes towards Using AI in HRM Practices in Jordanian food, beverage and livestock Industrial Companies

The perceived usefulness has a positive relationship with the attitudes toward the use of AI in the implementation of HRM practices in Jordanian food, beverage and livestock Industrial Organizations. AI integration is considered a factor that improves the effectiveness of HRM practices where it fills the gap between traditional methods and current advancements in technology in an endeavor of resource management and decision-making (Huang & Hayat, 2019; Alsheibani et al., 2019). Positive attitudes are formed when employees consider AI as useful and this has an overall consequential influence on the process of human resource management that involves talent acquisition, and turning the screw on anticipated employee turnover and workforce management (Hemalatha and Kumari, 2020; Bosco, 2020). The perceived usefulness in the improvement of knowledge-sharing methods and operational efficiency can also enhance the positive attitudes as research pointing at the use in increasing the Job efficiency as well as consumer experience within the HRM (Sjøberg, 2022, Mikalef et al., 2023). From these studies,

the adoption of AI is found to complement the organizational goals and objectives in addition, it also builds resistance to technological change thus improving the adaptability of the organizations and a favorable environment for incorporation of Artificial intelligence (Iwuanyanwu, 2021). Therefore, based on the evidence from these studies, it can be hypothesized that:

H2: Perceived Usefulness positively impacts Attitudes towards Using AI in HRM Practices in Jordanian food , beverage and livestock Industrial Companies.

3.3 Managerial Attitudes towards Using AI mediate the relationship between Perceived Ease of Use and Job Efficiency in Jordanian Food, Beverage, Agriculture, and Livestock Industrial Companies

Perceived ease of use and job efficiency are related among Jordanian food , beverage and livestock industrial companies with the help of attitudes towards using AI. Albeit, previous studies indicate that the adoption of AI helps enhance the efficiency of working in Jordanian industrial firms regarding information regarding the workforce, the functioning of the HR department, and organizational strategic management (Abu Khaled, 2021; Xin et al., 2022). This shows that when AI systems are viewed as easy to use their acceptance by employees changes for the better and overall job Efficiency is improved. As Yang (2022) and Alnamrouti et al. (2022) highlighted AI increases the rate of performing routine tasks and helps in big data processing related to the improvement of HRM functions. Ahmad et al. (2023) also stress the significance of robust technological support to the general AI concept since ease of technology use determines the employees' perception and consequently their performance. Aloqaily and Rawash (2022) have provided a study that shows how AI integration in the model enhances job efficiency by linking particular organizational activities with available technologies. This is made possible by the fact that employees with positive attitudes towards AI have a gap between ease of use and job efficiency. Fraji and Várallyai (2021) also stress this factor, noting that culture plays an equally crucial role in achieving these outcomes as there are organizations with an appropriate culture for the introduction of AI. Hence, in the case of Jordanian food , beverage and livestock industrial companies, it is essential to encourage positive attitudes towards AI to bridge the perceived ease of use and consequent effectiveness of enhancing job efficiency, and ultimately the achievement of innovative and strategic growth for competitive advantage. Therefore, based on the evidence from these studies, it can be hypothesized that:

H3: Managerial Attitudes towards Using AI mediate the relationship between Perceived Ease of Use and Job Efficiency in Jordanian food , beverage and livestock Industrial Companies.

3.4 The Positive Impact of AI Integration into HRM Practices on Job Efficiency

Studies conducted in diverse contexts also affirm that incorporating aspects of AI in human resource management (HRM) enhances job performance. Hemalatha and Kumari (2020) showed that the role of AI is quite shifting the organizational processes like hiring and decisions making for the development of the critical human resources in IT firms in Greater Chennai and improving the job efficiency. In a similar experiment of Olan et al. (2022) it was found that the efficiency and effectiveness of the combined use of these approaches of knowledge-sharing and application AI in Nigerian companies have also raised the job efficiency propping up the role of AI in the

improvisation of the HR practices that involve knowledge management. Specifically in the Nordic countries, Sjøberg (2022) and Mikalef et al. (2023) highlighted that only ethical use of AI and its effect on the data-driven decision-making process improves internal flexibility and operating proficiency to produce better job performance in an organization. Furthermore, Iwuanyanwu (2021) also observed that there is the advancement of AI in the American businesses heightened organizational competitiveness, again supporting the positive impact of AI in jobs efficiency in of HR practices.

Research in other parts of the world such as Jordan also supports this hypothesis given the positive change that AI is expected to bring in the future of HRM. Hmoud and Varallyai (2023) also noted a group of common positive perceptions among the Middle Eastern HRM executives about AI technologies as enablers that bring higher efficiency, effectiveness, and quality improvements to the HR processes. In addition, Aloqaily and Rawash (2022) also confirmed that the incorporation of AI in administrative tasks for the Jordanian private sector firms enhance the time, accuracy, and efficiency of the performance. Altogether, these studies offer supported advocacy of the support of AI integration into the HRM practices of organizations and their practices in recruitment, decision-making, and administrative services by improving job efficiency across numerous contexts. Therefore, based on the evidence from these studies, it can be hypothesized that:

H4: AI Integration into HRM Practices Mediates the positive effect on Job Efficiency

3.5 AI Integration into HRM Practices as a Mediator Between Perceived Usefulness of AI Adoption and Job Efficiency

Research studies conducted on the applicability of AI within the framework of the HRM practices have pointed to positive correlation to job efficiency domain globally. The Malaysian study by Xin, Wider, and Ling (2022) provided evidence that the utilization of AI in HR has a positive effect on job performance indicating that the perceived usefulness of AI in HRM leads to positive organizational outcomes. This is in line with the future of an AI-driven HRM system implemented in China identified by Yang (2022) where the system enhances employee quality as well as business performance through efficiency data mining and algorithms. It is emphasized in these works that AI's functions in supporting decision making tasks typical of HRM can greatly enhance the efficiency of the job.

Likewise, research carried out in Jordan also supports this hypothesis to the effect that there is a positive relationship between the use of AI in HRM practices. Earlier in this paper, Abu-Khaled (2021) urged that there are positive relationships between; AI efficiency, automation, ease of use and the improvement of HR processes, which all point to the positive effect of integrating AI to enhance the efficiency of jobs. In line with the foregoing, Alnsour et al. (2024) confirmed the benefits of AI use in the recruitment and selection processes of employees in the Jordanian commercial banks by cutting costs, time and biases to increase the efficiency of HRM. Also, Hmoud and Varallyai (2020) have identified perceived usefulness and trust in AI based Human Resources Information Systems (HRIS) as the antecedents of job efficiency which proves the importance of trust and technological readiness for implementation of AI in the company. Altogether, to make a long story short, these studies present strong evidence that AI

incorporation into the HRM practices positively impacts the job efficiency by advancing the HR methods and choices in various kinds of organizations. Therefore, based on the evidence from these studies, it can be hypothesized that:

H5: AI integration into HRM practices mediates the relationship between the perceived usefulness of AI adoption and job efficiency.

3.6 AI Integration into HRM Practices as a Mediator Between Perceived Ease of Use and Job Efficiency

The hypothesized model that posits integration of AI into the HRM practices as a mediator between perceived ease of use of AI and job efficiency is evidenced by cross-sectional research conducted in various settings globally. Alsheibani et al. (2019) as well as Huang and Hayat (2019) have noted that the perceived ease of use is one of the most influential factors in AI adoption and implementation in any organisation. When the AI tools are considered by the personnel as easy to use then this will promote its adoption by the organizations making it possible to be integrated within HRM practices. This synchronization, in its own right contributes positively to the enhancement of the job efficiency by acting as a way to simplify the Human Resource processes, engage the employees and enhance the training interventions. For example, Bosco 2020 for the Indian context as well as Hemalatha and Kumari 2020 also concluded that due to the perceived ease of use of AI and the influence of this perceived ease of use on the extent of AI usage it can be stated that AI enhances the efficiency of jobs and improves overall organizational performance outcomes.

Furthermore, as understand in the prior study; Iwuanyanwu (2021) on the United States of American found out that the extent to which AI is adopted influence the competitive advantage of firms; therefore, the perceived ease of use plays a pivotal role in the application of AI technologies. In the same regard, Olan et al. (2022) working in Nigeria and Sjøberg (2022) in Nordic countries revealed that the Levels of utilization of AI, coupled with other organizational strategies such as knowledge sharing enhances the job efficiency. Mikalef et al. (2023) go further by using the Norway context to establish that AI integration incurs positive effects on the operation efficiency and consumers point of view. Such research works, therefore, provide that when AI is perceived to ease use, this translates in it being adopted in the HRM practices, thus acting as a moderator between ease of use and job efficiency through converting perceived gains into real organizational enhancements. Therefore, the AI integration can be considered as a mediator which transmits the positive effect of the user-friendly AI into the increased job effectiveness in the context of different organizations. Therefore, based on the evidence from these studies, it can be hypothesized that:

H6: AI Integration into HRM practices mediates the relationship between the perceived ease of use and job efficiency.

3.7 AI Integration into HRM Practices as a Mediator Between Managerial Attitude and Job Efficiency

A number of studies done in other contexts have provided support to the hypothesis that the relationship between managerial attitude and job efficiency is mediated by the integration of AI

into HRM practices in Jordan. According to the study conducted by Hmoud and Varallyai (2023), the decision-making process on AI integration depend on the managerial attitudes towards The Middle East countries including Jordan into the, has been considered as crucial for the effective implementation of innovative HRM practices. The level of adoption of the AI in the HR function is therefore good, having been prompted by positive managerial perspectives on the efficiency and effectiveness of the AI system, thus supporting the hypothesis that managers trust in the AI system contributes to the adoption of this system. This is further supported by Aloqaily and Rawash (2022), they noted that Jordanian companies' integration of AI also results in the enhancement of performance indicators including speed, quality, and accuracy of the work done and implying that positive managerial attitudes towards AI are an indication of better AI integration which means that job efficiency is also enhanced.

Similar research by Fraji and Várallyai (2021) and Vrontis et al. (2023) have also highlighted the need to pay attention to the managerial attitude regarding AI deployment in the context of human resource management. Specifically, Fraji and Várallyai (2021) stressed trust as the factor closely related to the managerial attitude that would predefine the AI acceptance and its integration into the processes of HRM thus, leading to job efficiency's positive impact. In fact, Vrontis et al. (2023) proved that there is the possibility of achieving efficiency improvement, however, such outcomes depend on managerial attitude toward AI adoption because it defines the level of AI tools' utilization in the frameworks of HRM. Back these findings, Cao et al. (2021) have unveiled the Integrated AI Acceptance-Avoidance Model (IAAAM) and explored the role of the UK managers' key beliefs about AI that significantly influence AI integration in the form of positive influencers such as performance expectancy and negative concerns such as well-being. Altogether, these research findings suggest that AI integration in the HRM moderates the relationship between managerial attitude and job efficiency in such a way that the perceived benefits of AI are transmitted via effective managerial support to bring about the improvements in job performance outcomes. Therefore, based on the evidence from these studies, it can be hypothesized that:

H7: AI Integration into HRM practices mediates the relationship between managerial attitude and job efficiency.

4. Methodology

4.1 Population and Sample of the Study

The investigation examines the effects of the application of AI on productivity in Jordanian industrial companies in the Food and Beverages, Catering, and Livestock industries in Amman, Zarqa and Irbid areas. The target population consists of 2,668 firms operating under the Jordan Chamber of Industry. From this population, a purposive sample of 153 industrial firms was selected. These firms were considered because of their application in analyzing the integration of AI into the practices of Human Resource Management (HRM). The sampling technique used in this study is purposive to ensure that firms that have either adopted or are in the process of adopting AI technologies in their HRM processes are included (Murugesan et al., 2023). The

sample includes the industrial organizations of Jordan, which gives a general idea of the AI integration practices across different organizations (Smith, 2020).

4.2 Research Design

This research uses a quantitative approach given that the research theory adopted is the Technology Acceptance Model (TAM). The current study adopted a positivist paradigm because it retains faith in an observable and measurable external world (Keser and Köksal, 2017). The research approach is quantitative as it seeks to test the proposed hypotheses by using numerical data and statistics to analyze the relationships between AI integration and efficiency, and different HRM practices and efficiency (Saunders et al., 2019). The hypotheses are formulated in such a manner that they can be empirically tested using quantitative measures to examine the statistical significance of the AI effects on the extent and nature of HRM changes and enhancement of organizational productivity (Jiménez-Jiménez & Sanz-Valle, 2011).

4.3 Instruments of the Study

The type of data gathering tool chosen in the study is a cross-sectional questionnaire that comprehensively comprises perceived usefulness and ease of AI integration, peer influence, organizational culture, technological infrastructure, and job efficiency of human resource management practices. The questionnaire also consists of items extracted from prior works, thereby providing a broad appraisal of AI use in HRM practices (Chatterjee et al., 2021; Cao et al., 2021; Rajan and Baral, 2015). The survey was developed in English while the common local language, Arabic, was used in translating it. This translation was done by accredited translation specialists to accommodate linguistic and contextual factors. To collect data relevant to the objectives of this study, a self-administered questionnaire was mailed to the HR managers in the targeted firms.

4.3.1 Validity and Reliability of the Instrument

To reduce the level of errors and increase validity and reliability of the study, the questionnaire was specially designed. An internal validity was maintained by measuring items that were in harmony with the research questions and literature. The questionnaire was also checked for relevance and clarity by four professors in the fields of HRM, AI, and organizational research (Drost, 2011). Construct validity was determined through factor analysis as explained by Mellor (2022). Reliability was tested using Cronbach's Alpha, showing high internal consistency with a coefficient of 0.77 or above (Edwin, 2019). A pilot study also confirmed the good clarity and understandability of the items and was used to check that they index the respective factors suitably.

4.4 Data Collection

The survey for this study was conducted using an online-based Google Form that allows a large number of participants to be reached easily (Rahman, 2023). While GPower suggested a sample size of 153 with a medium effect of 0.15 (Cohen, 1988), the study targeted a larger sample for better generalizability, considering low response rates in Amman, Zarqa, and Irbid. The questionnaire was sent to HR managers in 350 AI-implementing firms in these cities, yielding 338 valid responses, surpassing the GPower minimum. A 'blind' approach was used to identify

participants, and synchronization messages were employed to boost response rates and data validity.

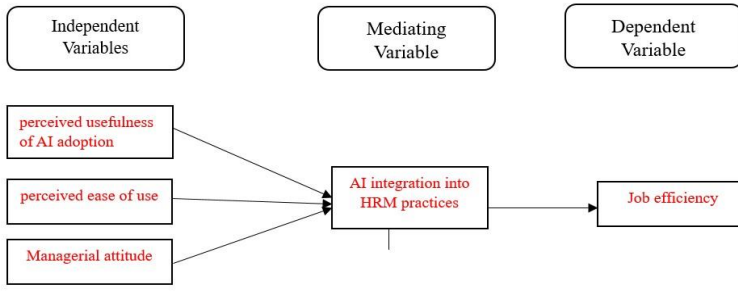
4.5 Data Analysis

The study employed Partial Least Squares (PLS) path modeling technology for data analysis with the aid of PLS Smart software, while the statistical power analysis involved the use of G-Power. In line with this, fixed hierarchical linear modeling tested the mediating influence AI use and job efficiency with valid and generalizable info (Saunders et al., 2009).

4.6 Variables of the Study

The variables of paper are (Perceived ease of use and Perceived usefulness) as an independent Variables. Also, the Attitudes towards using AI variable as Mediating Variable. Finally, the dependent variable is Job efficiency. Figure 2 below shown the variables and model of study.

Figure 2 Study Variables and Model



(Source: Researcher's Construction, 2024).

4.7 Ethical Considerations

Ethical practices were followed; participant information was explained, consent was sought, and the info collected was anonymous. Hence the ethical issues were voluntarism, data management and privacy. In addition, the researcher also presented summary of results to the involved organizations to encourage them to participate in the research.

5. Findings

This stage involves the measurement and formatting of the initial data. It shows example demographics including Company size, Management Level, Age, Gender, and Education. Hypothesis testing methods are given using SmartPLS4.

The statistical population of this research includes industrial companies' employee selected as the population for this study at Jordanian industrial companies. The population of this study (target of the population) comprised 153 companies. The questionnaire contains 72 questions

that were measured using the Likert scale of 5 points. A total of (350) questionnaires were distributed online to companies. Of those, (338) were received for a gross response rate of 97%. The responses from 338 managers were valid and significantly higher than the 146 sample size calculated through the G*Power calculator.

5.1 Descriptive Statistics of the Study

Descriptive analytics is the first phase of data analysis. Therefore, before analyzing any data set, this data must be understood. Descriptive analytics provides data in a meaningful way to understand whether there is something to do for data to prepare for analysis (McCarthy et al., 2019). Many statistical tests can be used and are divided into measures of central tendency and measures of variability.

5.1.1 The Study Sample

The researcher used the frequency and percent for the demographic variables as below shown in Table (1).

Table (1) Frequency and Percent for the Demographic Variables

Variable	Classification	Frequency	Percent
Company Size	Small (less than 20 employees)	4	1.2
	Medium (20-99 employees)	154	45.6
	Large (More than 100 employees)	180	53.3
	Total	338	100.0
Management Level of Respondent	HR Manager	300	88.8
	HR Personnel	38	11.2
	Total	338	100.0
Age	Under 25	5	1.5
	25-34	53	15.7
	35-44	194	57.4
	45-54	75	22.2
	55 and above	11	3.3
	Total	338	100.0
Gender	Male	202	59.8
	Female	135	39.9
	Prefer not to say	1	.3
	Total	338	100.0
Educational Background	Diploma	13	3.8
	Bachelor's Degree	180	53.3
	Master's Degree	101	29.9
	PhD	43	12.7
	Others	1	.3
	Total	338	100.0

Table (1) shows the sampling frequency according to demographic variables: The majority of respondents (53.3%) work for large firms with more than 100 workers, followed by medium-sized (20-99) at 45.6% and tiny (less than 20) at 1.2%. 88.8% are HR Managers, 11.2% are HR Staff. Most participants are 35–44 (57.4%), with smaller groups of 25–34 (15.7%) and under 25 (1.5%). Males (59.8%) outnumber girls (39.9%). The majority (53.3%) have a Bachelor's Degree, followed by 29.9% with a Master's and 0.3% with other degrees.

5.2 Descriptive Analysis of Study Factors

The researcher used the arithmetic mean, standard deviation and importance level as below shown in Table (2).

Table 2 Means and standard deviations for variables of study

No.	Factor	Mean	SD	Order	Importance
1	AI adoption perceived ease of use	4.39	.42	1	High
2	AI adoption perceived usefulness	4.38	.43	2	High
4	Job efficiency	4.37	.46	3	High
3	Managerial attitude	2.81	.51	4	Moderate
	Total	3.99	0.45	---	High

Table 2 shows Means and standard deviations for variables of study, the range means for variables is between (2.81 – 4.39), the higher means for (AI adoption perceived ease of use) in (mean=4.39, SD= 0.42), but the lower means for (Managerial attitude) in (mean=2.81, SD= 0.51). Total means was (3.99) by highly agreement.

5.3 Data Analysis

5.3.1 The Measurement Model

The measurement model or outer model relates observed variables to their latent variables. In the current study, the measures of absorptive capacity, entrepreneurial orientation, human capital, relational capital and structural capital are measured as reflective constructs. The following analyses were used to evaluate the measurement model:

5.3.1.1 Cross Loading:

Outer loadings. For reflective models, these are the key indicators showing the path from the latent variable to the observed variables. Therefore, they show how every observable variable or element absolutely contributes to the definition of the construction or latent variable.

The results of this analysis confirm that the measures have factor loadings greater than (0.4) as shown in Table (3). All factor loadings are extremely significant at level (a= 0.5). Furthermore, an indicator's outer loadings on a construct are higher than all its cross-loadings with other constructs

Table 3 Cross Loading

Constructs	AI adoption perceived ease of use of AI	AI adoption perceived usefulness of AI	Managerial attitude towards AI	Job efficiency
a1		.563		
a2		.647		
a3		.617		
a4		.619		
a5		.682		
a6		.658		
a7		.591		
a8		.571		
b1	.621			
b2	.589			
b3	.584			
b4	.598			

b5	.559			
b6	.646			
b7	.662			
b8	.622			
b9	.611			
b10	.642			
c1			.577	
c2			.601	
c3			.505	
c4			.602	
c5			.601	
c6			.636	
c7			.653	
c8			.553	
c9			.570	
c10			.572	
c11			.600	
c12			.713	
c13			.417	
c14			.726	
c15			.761	
c16			.724	
c17			.686	
c18			.653	
h1				.643
h2				.703
h3				.733
h4				.714
h5				.700
h6				.667
h7				.611
h8				.613
h9				.682
h10				.647
h11				.680
h12				.674
h13				.640

5.3.1.2 Discriminate Validity

Shows that the correlations between constructions are smaller than the square root of the average variance extracted, thereby confirming the validity of discernment. As shown in table 4), the square root of the average variance extracted of each construct is greater than its highest correlation with other constructs. Fornell-Larcker Criterion criteria, suggested by Fornell and Larcker, 1981 were used to test the discriminant validity (Table II) and as all loadings of an indicator on its assigned latent variable higher than its loading on all other latent variables, the requirement for discriminant validity was fulfilled:

Table 4 Discriminate Validity for Study Constructs

	Managerial attitude towards AI	Job efficiency	AI adoption perceived ease of use of AI	AI adoption perceived usefulness of AI
Managerial attitude towards AI				
Job efficiency	0.638			
AI adoption perceived ease of use of AI	0.637	0.764		

AI adoption perceived usefulness of AI	0.660	0.834	0.871	

As seen in table 7 all the loading of each indicator on its assigned latent variable is higher than its loading with other variables which means that the degree to which a measure diverges from (i.e., does not correlate with) another measure whose underlying construct is conceptually unrelated to it.

5.3.1.3 Internal consistency or reliability of the scale

It reflects the way in which the elements of the instrument measure various aspects of the same structure (Michalos, 2014). Cronbach's alpha reliability (Cronbach, 1951) is one of the most widely used reliability measurements in social fields and organizational science. Cronbach's alpha reliability indicates the positive correlation between the elements of a group and describes the reliability of a sum or mean of measures. Cronbach's alpha reliability coefficient typically ranges between (0.0 - 1.0). Table (5) showed that the Cronbach's alpha for all variables are between (.0683 – 0.932), which indicates a positive correlation between the elements of the group.

5.3.1.4 Composite*Reliability

It's like Cronbach's alpha. Composite reliability is an indication of the common variation among observed variables used as an indicator of latent construction. (Netemeyer, 2003; Fornell & Larcker, 1981). Composite reliability must exceed 0.70% and all variables must match acceptable reliability levels. Table (5) showed that the Composite reliability for all variables is between (0.716- 0.934), which exceeds (0.70%).

5.3.1.5 Convergent*validity

Average variance extracted (AVE) is a measure of the amount of variance which is captured by a concept relative to the amount of variance due to measurement error. Table (5) showed that the (AVE) ranges between (0.505) and (0.653) which exceeds (0.5) in most variables. Thus, convergent validity is achieved.

Table 5 Confirmatory factor analysis and composite reliability.

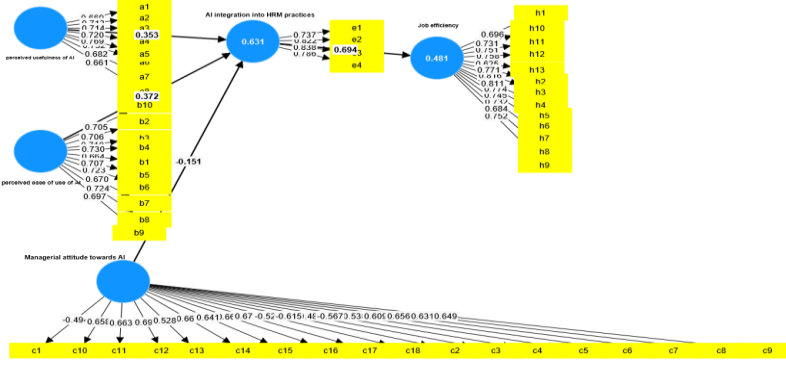
Construct	Code	Loading	Cronbach's* Alpha	Composite Reliability*	Average Variance* Extracted* (AVE)
AI adoption perceived usefulness of AI	a1	.389	0.860	0.862	0.505
	a2	.494			
	a3	.524			
	a4	.612			
	a5	.546			
	a6	.627			
	a7	.486			
	a8	.490			
AI adoption perceived ease of use of AI	b1	.479	0.887	0.887	0.595
	b2	.522			
	b3	.616			
	b4	.641			
	b5	.576			
	b6	.518			
	b7	.579			

	b8	.587			
	b9	.512			
	b10	.595			
Managerial attitude towards AI	c1	.550	0.816	0.897	0.575
	c2	.526			
	c3	.523			
	c4	.604			
	c5	.475			
	c6	.700			
	c7	.727			
	c8	.824			
	c9	.866			
	c10	.873			
	c11	.825			
	c12	.751			
	c13	.441			
	c14	.770			
	c15	.799			
	c16	.820			
	c17	.776			
	c18	.493			
Job efficiency	h1	.472	0.932	0.934	0.553
	h2	.587			
	h3	.662			
	h4	.701			
	h5	.628			
	h6	.614			
	h7	.577			
	h8	.516			
	h9	.564			
	h10	.573			
	h11	.583			
	h12	.574			
	h13	.810			

5.3.2 The Structural*Model*

The structural model specifies the relationships between the independent variable and dependent variable, the structural model of this study is linear relationship exists between absorptive capacity, entrepreneurial orientation, human capital, relational capital and structural capital.

Figure 3 Path Coefficients Value



The model shows that the AI integration into HRM practices, perceived ease of use, perceived usefulness, managerial attitudes and job efficiency can explain 48.1% of the internal audit quality. according to the Falk and Miller, (1992) the explanatory power of the R^2 above 10% is acceptable.

5.3.3 Hypotheses Result

The researcher should test the significance of the path coefficients in the model to test hypotheses. Therefore, this can be used to examine the possible causal relationship between statistical variables (Donate and Pablo 2015).

Table (6) shows the results of the complete model. In this method, the test result is expressed in two statistics: The path coefficient (β), standard error and P- Value. If the absolute P- value less than (0.05) indicates the path is significant.

Table 6 Results for the Proposed Hypotheses

Hypotheses	Relation	Standardized Coefficient (Beta β)	P- Values (Sig.)	Hypothesis Results
H1	The perceived usefulness of AI adoption has a positive impact on AI integration into HRM practices.	0.353	0.000	Supported
H2	The perceived ease of use has a positive impact on AI integration into HRM practices.	0.372	0.000	Supported
H3	Managerial attitude has a positive impact on AI integration into HRM practices.	-0.151	0.281	Rejected
H4	The integration of AI into HRM practices has a positive impact on job efficiency.	0.694	0.000	Supported
H5	AI integration into HRM practices mediates the relationship between the perceived usefulness of AI adoption and job efficiency.	0.245	0.000	Supported
H6	AI Integration into HRM practices mediates the relationship between the perceived ease of use and job efficiency.	0.258	0.000	Supported
H7	AI Integration into HRM practices mediates the relationship between managerial attitude and job efficiency.	-0.105	0.290	Rejected

H1: The Perceived Usefulness of AI Adoption has a Positive Impact on AI Integration into HRM Practices

The results for AI integration into HRM practices mediates the relationship between AI adoption perceived ease of use of AI and job efficiency have a significantly effect on job efficiency ($\beta = 0.353$, $p < 0.05$), Thus, it is a significant. Then, H1 is supported.

H2: The Perceived Ease of Use Has a Positive Impact on AI Integration into HRM Practices

The results for AI integration into HRM practices mediates the relationship between AI adoption perceived usefulness of AI and job efficiency have a significantly effect on job efficiency ($\beta = 0.372$, $p < 0.05$), Thus, it is a significant. Then, H2 is supported.

H3: Managerial Attitude Has a Positive Impact on AI Integration into HRM Practices

The results for AI integration into HRM practices mediates the relationship between managerial attitude towards AI and job efficiency have no significantly affect on job efficiency ($\beta = -0.151$, $p > 0.05$), Thus, it is no significant. Then, H3 is not supported.

H4: AI Integration into HRM Practices Mediates the Positive Effect on Job Efficiency

The results for AI integration into HRM practices have a significantly positive effect on job efficiency ($\beta = 0.694$, $p < 0.05$), Thus, it is a significant. Then, H5 is supported.

H5: AI Integration into HRM Practices Mediates the Relationship Between the Perceived Usefulness and Job Efficiency

The results for AI integration into HRM practices mediates the relationship between AI adoption perceived usefulness of AI and job efficiency have a significantly effect on job efficiency ($\beta = 0.245$, $p < 0.05$), Thus, it is a significant. Then, H6 is supported.

H6: AI Integration into HRM Practices Mediates the Relationship Between the Perceived Ease of Use and Job Efficiency

The results for AI integration into HRM practices mediates the relationship between AI adoption perceived ease of use of AI and job efficiency have a significantly effect on job efficiency ($\beta = 0.258$, $p < 0.05$), Thus, it is a significant. Then, H7 is supported.

H7: AI Integration into HRM Practices Mediates the Relationship Between Managerial Attitude and Job Efficiency

The results for AI integration into HRM practices mediates the relationship between managerial attitude towards AI and job efficiency have no significantly affect on job efficiency ($\beta = -0.105$, $p > 0.05$), Thus, it is no significant. Then, H8 is not supported.

6. Discussion

6.1 The Perceived Ease of Use Has a Positive Impact on AI Integration into HRM Practices

The results also reveal that perceived ease of use of AI strongly and positively affects job efficiency in Jordanian industrial companies with a value of $\beta = 2.971$ and $p = 0.003$, thus supporting Hypothesis 1. Intuitive AI applications enhance efficiency as they reduce the difficulty of the HR roles thus supporting the Technology Acceptance Model with reference to Davis (1989). This concurs with Singh et al. (2020) and Zhu (2021) who pointed that decision makings had enhanced with the use of Artificial Intelligence in the area of HRM. Similarly, Li et al. (2023) have taken the same stand for the easy-to-use AI technologies for the optimization of organizational performance. On this view, this study contradicts Baldegger et al. (2020) in asserting that perceived usefulness depends more on ease of use than on organizational support.

6.2 The Perceived Usefulness has a Positive Impact on AI Integration into HRM Practices

The study also reveals that perceived usefulness of AI has a direct influence on the attitudes towards the use of AI in the HRM practices ($\beta = 2.812$, $p = 0.005$), thereby providing support for Hypothesis 2. Higher perceived usefulness enhances adoption of the technology in HRM related jobs such as data processing and decision making as proposed by the Technology Acceptance Model for end users by Davis (1989). This is in consonance with the study done by Hemalatha & Kumari (2020) and Bosco (2020), you find that perceived usefulness has the largest influence on the efficiency of HRM. Mikalef et al. (2023) also outline more operational advantages of AI. Different from Huang & Hayat (2019), the tests show that the perceived usefulness is significantly greater than the perceived risks that enhance positive AI attitudes.

6.3 Managerial Attitude Has a Positive Impact on AI Integration into HRM Practices

The result of the analysis reveals that perceived ease of use has a significant relationship with job efficiency and completely militates against Hypothesis 3 by negating the moderating influence of the respondents' managerial attitudes ($\beta = 0$, $p = 0$, $R^2 = 0.953$). This implies that managerial attitudes do not mediate between ease of use and job performance as do perceived usefulness (Davis 1989). This work also disagrees with Yang (2022) and Alnamrouti et al. (2022) who revealed that attitudes improve performance; ease of use is stronger with the influence of managerial mediation unlike the previous researches due to difference in organizational culture or level of AI adoption. Ahmad et al. (2023) and Aloqaily & Rawash (2022) focus on supporting; they both put attention to attitudinal roles of complementary support.

6.4 AI Integration into HRM Practices Mediates the positive effect on Job Efficiency

The results of H4 suggest that the implementation of AI in HRM practices improves the efficiency of job ($\beta = 0.694$, $t = 2.732$, $p < 0.05$), which support the hypothesis. Recruitment, training and decision-making processes are enhanced leading to reduced costs and mistakes which is in line with TAM (Davis, 1989). This proves that perceived usefulness of AI increases the use and effectiveness of the system as noted by Xin, Wider and Ling (2022), Yang (2022), and Sjøberg (2022). However, this is in contrast to Abu-Khaled (2021) who holds the view that human judgement cannot be entirely replaced in the technical roles in HR suggesting that AI may not always improve on the job performance in every organization.

6.5 AI Integration into HRM Practices as a Mediator Between Perceived Usefulness of AI Adoption and Job Efficiency

The study showed that the integration of AI in procedures of HRM impacts work efficiency ($\beta=0.245$, $p<0.05$) where the perceived usefulness of AI mediates the vital relationship between efficiency of job and usefulness of AI. The HRM procedures are made efficient and effective each time there is value for AI since it sharpens the strategic directions, decisions and effectiveness. Based on Davis's (1989) Technology Acceptance Model (TAM), perceived usefulness has a direct relationship on the behavioral intention to use technology and that is why the integration of AI when considered useful increased work efficiency. Xin, Wider, and Ling (2022), and Yang (2022) confirms that AI-integrated HRM practices enhances performance through use of analytics and decision-making tools. In a recent video, Abu Khaled (2021)

reaffirmed that although AI increases efficiency the use of human hunch and decision making is paramount; meaning that the integration of AI may not be sufficient to enhance the labor efficiency in every setting.

6.6 AI Integration into HRM Practices as a Mediator Between Perceived Ease of Use and Job Efficiency

In H6, AI integration in HRM practices positively impacts work efficiency ($\beta = 0.258$, $p < 0.05$) by mediating the association between perceived AI ease of use and job efficiency. This may be because AI technologies that are simple to use are more likely to be accepted and incorporated into HRM practices, simplifying procedures, decreasing manual mistakes, and boosting decision-making. The Technology Acceptance Model (TAM) by Davis (1989) states that perceived ease of use increases technology utilization, which may enhance work performance. This supports Alsheibani et al. (2019) and Huang and Hayat (2019), who showed that perceived ease of use drives AI adoption and organizational efficiency. This contrasts with Abu Khaled (2021), who indicated that AI adoption may improve work efficiency, but it still needs human intuition and decision-making to reach ideal results, suggesting that AI alone may not always be enough.

6.7 AI Integration into HRM Practices as a Mediator Between Managerial Attitude and Job Efficiency

According to H7, integrating AI into HRM processes does not substantially impact work efficiency ($\beta = -0.105$, $p > 0.05$). This may be because management attitudes may impact AI technology adoption, but they may not directly improve work efficiency without additional supporting variables like training and organizational preparation. According to Davis (1989)'s Technology Acceptance Model (TAM), management attitudes about AI may affect its perceived ease of use and usefulness, but without direct support and integration into practice, they cannot drive performance results. This supports Fraji and Várallyai (2021), who found that trust and management support are important but not sufficient for AI integration. It conflicts with Aloqaily and Rawash (2022), who found that favorable management views toward AI in Jordanian enterprises improve job efficiency, indicating that contextual or environmental variables may influence this connection.

7. Conclusion

The research investigates how AI integration impacts labor efficiency in Jordanian food, drink, farming and livestock sectors. It investigates perceived ease of use, perceived usefulness, management attitudes and work efficiency using the TAM. Results indicate that perceived simplicity and usefulness drive AI incorporation into HRM processes boosting job productivity. Without organizational support, managerial attitudes alone do not impact work efficiency. Quantitative methods and also a cross-sectional question asked to HR managers in selected industrial companies accumulate information for SmartPLS4 analysis. The study examines AI integration with HRM practices in Jordan's food 1and1 beverage, farming and livestock industries. Future studies might include other industries or locations to evaluate just how AI

impacts HRM internationally. The report suggests that Jordanian enterprises train and foster a tech-friendly culture to embrace AI. Managers must adopt AI-friendly mindsets and prepare their staff members for AI-driven HR. Legislative frameworks and support structures for HRM AI deployment are warranted by policymakers and business leaders. It mediates perceived usefulness/ease of use/management perceptions & work efficiency in Jordanian industry via AI integration. HR specialists, politicians and business executives must align corporate culture, preparedness and skills adaption to AI adoption.

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