

# The impact of implementing AI in recruitment on human resource management efficiency and organizational development effectiveness

Ahmad Suliman Alnsour<sup>1,\*</sup>, Omar Ali Kanaan<sup>2</sup>, Maimar Salah<sup>1</sup>, Leen Alfayad<sup>1</sup>, Yara Hijazi<sup>1</sup>, Dana Alsharif<sup>1</sup>

<sup>1</sup> Business Administration Department, Princess Sumaya University for Technology (PSUT), Amman 1438, Jordan

<sup>2</sup> Business Administration Department, Applied Science Private University (ASU), Amman 11937, Jordan

\* **Corresponding author:** Ahmad Suliman Alnsour, [a.alsour@psut.edu.jo](mailto:a.alsour@psut.edu.jo)

## CITATION

Alnsour AS, Kanaan OA, Salah M, et al. (2024). The impact of implementing AI in recruitment on human resource management efficiency and organizational development effectiveness. *Journal of Infrastructure, Policy and Development*. 8(8): 6186. <https://doi.org/10.24294/jipd.v8i8.6186>

## ARTICLE INFO

Received: 3 May 2024

Accepted: 31 May 2024

Available online: 15 August 2024

## COPYRIGHT



Copyright © 2024 by author(s).

*Journal of Infrastructure, Policy and Development* is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. <https://creativecommons.org/licenses/by/4.0/>

**Abstract:** This study investigated the utilization of Artificial Intelligence (AI) in the Recruitment and Selection Process and its effect on the Efficiency of Human Resource Management (HRM) and on the Effectiveness of Organizational Development (OD) in Jordanian commercial banks. The research aimed to provide solutions to reduce the cost, time, and effort spent in the process of HRM and to increase OD Effectiveness. The research model was developed based on comprehensive review of existing literature on the subject. The population of this study comprised HR Managers and Employees across all commercial banks in Jordan, and a census method was employed to gather 177 responses. Data analysis was conducted using Amos and SPSS software packages. The findings show a statistically significant positive impact of AI adoption in the Recruitment and Selection Process on HR Efficiency, which in turn positively impacted OD Effectiveness. Additionally, the study indicated that the ease-of-use of AI technologies played a positive moderating role in the relationship between the Recruitment and Selection Process through AI and HR Efficiency. This study concludes that implementing AI tools in Recruitment is vital through improving HR Efficiency and Organization Effectiveness.

**Keywords:** recruitment; artificial intelligence; human resource management; organizational development; efficiency; effectiveness

## 1. Introduction

In any organization around the world, employees are considered as valuable asset. Human Resource Management (HRM) is primarily focused on managing this significant asset, including but not limited to attracting, recruiting, and retaining the top talented employees, managing employee competencies, and the optimization of cost-effectiveness. These roles are vital for enhancing organizational effectiveness (Ertel, 2017). The main HRM functions in any organization include staffing, training, performance management, rewards and benefits, employee-management relations, and health and safety (Dessler, 2011, p. 4). After the process of HR planning, recruitment and selection process takes place, this process, as other HR processes, burdens the organization in terms of finance, time, and efforts. Organizations should strive to control these expenditures and reach an efficient process in HRM including recruitment and selection process.

In today's world, organizations implement Artificial Intelligence (AI) technologies and Automation to enhance the quality of their services and to reduce the cost of doing some functions (Deepa et al., 2024). AI offers a significant potential role in recruitment and selection process by reduce biasness, errors, time, costs, and efforts (Tambe et al., 2019).

Alfaouri and Bataineh (2024) mentioned that “Despite the rapid technological advancements and growing interest in AI for HR functions like screening, selection, and predictive analytics, there’s a notable lack of empirical evidence regarding its actual effectiveness on key metrics such as time-to-hire and cost-per-hire”. This research aims to bridge this gap in literature review by studying the real impact of using AI tools in recruiting and selecting process in Jordanian commercial banks.

### **1.1. Problem statement**

Efficiency in HRM often involve a significant time, effort, and costs. Organizations often struggle to identify and eliminate inefficiencies in their HR processes including recruitment and selection process, leading to wasted resources and increased costs (Krajewski et al., 2019). For instance, implementing a new HR technology can be a costly and time-consuming process, with a significant amount of effort and expense required to train employees and integrate the technology into existing HR processes (Henderson and Venkatraman, 1990). Organizations often struggle to effectively identify and address the root causes of organizational issues, leading to wasted resources and increased costs (Cameron and Quinn, 2006). Organizations often lack the necessary expertise and resources to effectively implement OD initiatives, resulting in a significant amount of wasted effort and expense (Cummings and Worley, 2016). Additionally, the complexity of the organizational development process is often compounded by a dearth of well-defined goals and objectives, which consequently engenders a sense of direction lessness and contributes to resource inefficiencies (Cummings and Worley, 2016).

### **1.2. Research purpose, importance and objectives**

Banking sector in Jordan consider as a vital contributor to economic development and growth (Istaiteyeh et al., 2024). When banks are functioning properly and effectively, they drive the economy towards productivity and growth, since this sector is a key internal source for any country and is a major attribute of the GDP growth.

Organizational effectiveness in banking sector needs to be subjected to constant improvements and developments that should match the technological developments. The main purpose of this research is to study the perceived impact of recruitment and selection process through AI on HRM Efficiency and Organizational Development Effectiveness in the Jordanian commercial banks. Additionally, to investigate whether the AI ease of use would moderate the relationship between HR through AI and HRM efficiency.

The importance of this research derived from the raising role of AI in business and how it started to have significant impacts in modern businesses. Therefore, there is an importance to study the impact of recruitment and selection process through AI on the efficiency of HRM, and how this could impact the organizational development effectiveness in the Jordanian commercial banks. This research aimed to study these factors to help businesses in Jordan and around the world to get the advantages of using AI in recruitment and selection process.

### **1.3. Operational definitions**

**Recruitment:** the activities that are done in order to identify, attract, and make shortlist comprising the most qualified candidates for the given position. Organization aims to create a superior workforce applicant that have a potential to meet the requirements of any specific job (Jenkins et al., 2009).

**Selection:** A process of conducting interviews with candidates for a specific vacant job within the company, followed by a comprehensive assessment of candidates' qualifications. This meticulous evaluation process culminates in the discerning selection of the most suitable individual based on predetermined criteria, thereby effectively filtering out unsuitable applicant (Jenkins et al., 2009).

**Artificial intelligence (AI):** a computer system of various types capable of performing routine duties that necessitate human intelligence. It can be considered as an imitation of human intelligence that is done by machines. This could include learning, reasoning, and self-correction and covers data with the potential interpretation taking into consideration that the ultimate aim is to minimize effort and time and maximize the potential for goals achievement (Helm et al., 2020).

**Automation:** The utilization of machines and technology that will ensure that different processes operate without human interference. This includes the use of control systems for the operation of the equipment including alarms and process notifications once a problem arises (Inagaki and Sheridan, 2019).

**Appointment:** the acceptance of candidates for a suitable job that will lead to the performance of certain duties and responsibilities assigned for a position (Dessler, 2011, p. 12).

**Commercial bank:** A financial entity that performs certain activities involving deposit and withdrawal of money for the general public in addition to providing loans and other similar activities (Prowse, 1997).

**Efficiency:** expresses how beneficial work is carried out using a specific machine and the way desired results are achieved without wasting resources, such as material, energy, effort, money, and time (Sundqvist et al., 2014).

**Effectiveness:** The capability of the organization's management to accomplish the desired targets in the specified time; i.e. concerned with end results (Sundqvist et al., 2014).

**Employment:** this covers the processes of recruiting, selecting, and arranging the right and fit person for the required job in any organization (Burchell et al., 2012).

**Hypothesis:** an assumption or idea which is presented for the sake of argument, these assumptions are tested to figure out if they are true or not (Willassen, 2008).

**Ease of use:** This metric evaluates the clarity and simplicity of a system or application for its intended users. It examines the level of effort required for users to effectively navigate and utilize the system, as well as their ability to adapt and customize it with flexibility. (Davis and Davis, 2015).

**Recruitment:** the activities that are done in order to identify, attract, and make shortlist that includes the best suitable candidates for the needed job. Organization aims to create a superior workforce applicant that have a potential to meet the requirements of any specific job (Jenkins et al., 2009).

**Selection:** A process where interviews of candidates are done for certain vacant

positions in the company, followed by a deep evaluation of candidates' qualifications, which leads to a careful selection of the right person based on certain standards that filters the unsuitable applicants (Jenkins et al., 2009).

#### **1.4. Research hypothesis**

Reaching study's objectives and purpose required developing Hypothesis, to do so, researchers built their Hypothesis depending on two main studies; the first study, the study of Chakraborty et al. (2020). They evaluated the influence of artificial intelligence on human resource management using PLS-SEM (Partial Least Squares-Structural Equation Modeling). They examined using AI in several HR functions (including Smooth Recruitment and Selection Process through AI) and its impact on Efficient HRM, and the effect of Efficient HRM on Effective OD. The second study, the study of Singh and Shaury (2021), studied the impact of AI on HR practices in the UAE. They examined the variable (Ease of Use) as a moderator between Integration of AI and Efficient HR Practices.

Following an extensive analysis of various dependent and independent variables, this study has yielded several hypotheses for exploration.

H1: Smooth Recruitment and Selection Process through AI affects HRM Efficiency.

H2: The effect of Smooth Recruitment and Selection Process through AI on HRM Efficiency is moderated by AI Ease of Use.

H3: HRM Efficiency affects Organizational Development Effectiveness.

## **2. Literature review**

### **2.1. Recruitment and selection**

Human Resource Department has evolved beyond its traditional role as personnel (administrative department) and now serves as a multifaceted overseer of various organizational tasks and operations (Abbas et al., 2024). For example, HRM is deeply involved in the planning of employee skills development, selection of the proper applicants with adequate skills, and ways to develop and grow employees' competencies. Recruitment and selection provide the data and information about job descriptions and what kind of human skills and qualifications are required, so that employers determine what kind of personnel to recruit, select and hire accordingly. Recruitment is a prime process because it deals with one of the most important assets of the company; people. A common misconception of recruitment is that it is a simple process, not being aware of the different complex issues that recruitment deals with (Atwijuka and Caldwell, 2017).

The process of recruitment can be viewed as the matching of a collection of different qualified candidates with various vacancies; it is concerned with seeking the best fit between the right candidate and the wanted position. So, recruitment can be considered as an HR strategy because it shapes the vision of what set of employees and skills will be added to the workforce, therefore, plans will be set accordingly (Stoilkovska et al., 2015).

Many organizations find it difficult to find and hire diverse people, and their

recruitment teams experience time pressure since open vacancies could result in adverse expenses and operational delays (Dessler, 2011, p. 11). Finding the ideal applicant in a talent pool full of unqualified people is another problem. The quality of the recruiting and selection process may be harmed as a result of the difficulties HR staff members face in locating unique opportunities and interviewing panel members who may have biases towards certain races or groups of people. Moreover, among the top qualities that companies look for in candidates are talent, expertise, and abilities, but it may be quite challenging to find that specific talent or expertise or even abilities and bring them on board (Dessler, 2011, p. 12).

## **2.2. Recruitment and selection through AI**

Due to the development and expansion in technological innovations (Abbas et al., 2023), HR professionals are capable of tracking and finding the proper talents that suit and fit the organization (Dijkkamp, 2019). Moreover, the application of artificial intelligence in recruitment and selection process, many research dived into that topic. During the researches and studies, many questions were raised; can AI totally replace recruiters? Will the implementation of AI lead to a higher unemployment rate? What could be the potential impacts of the implementation of AI? Does the implementation of AI change the recruitment processes? Will implementing AI in recruitment helps in increasing employees' diversity? What potential opportunities and risks could exist in the adoption of AI in the recruitment process? (Stoilkovska et al., 2015).

AI can deal with recruitment in many ways that will satisfy organizational requirements. First, AI makes the screening process more efficient, transparent, easier, and fairer. Second, by using online job boards, it can give a better candidate fit. Lastly, it improves the retention and development of employees through the protection of the future talent pipeline (Dijkkamp, 2019).

The lifecycle of talent acquisition includes the recruitment stage, selection, sourcing, hiring, onboarding, and preparing. So, moreover in the application of artificial intelligence in recruitment and selection process, there will be a change in the role of HR professionals over time. HR professionals have certain responsibilities and thus, certain competencies are required to be able to fulfill tasks in a way that adds value to the company. AI-powered pre-selection software will utilize predictive analysis in order to make necessary measurements that show the potential of any candidate in succeeding in a specific role; consequently, the employer will be able to make hiring decisions based on factual data and not on feelings. Additionally, AI is used now in recruitment and selection to have a smoother first round of applicant screening, where AI will be able to do the needed filtration and elimination of candidates that are not suitable for the job (Bakshi and Damle, 2022).

AI can narrow down the big pool of candidates to a high predicted success rate by evaluating them through leveraging proven performance data, survey responses, and identifying candidate traits that has to be looked for, all of which can reduce biased recruitment and selection (Bakshi and Damle, 2022). Furthermore, Bakshi and Damle (2022) suggest that the utilization of AI in the recruitment process can positively impact the role of the employer. While online recruitment can be

considered as an effective tool, as it gives access to more people and quick turn-around time among others which will result in cost- effectiveness, accessing more people, and the ability to target people with high skills (Bakshi and Damle, 2022). Nevertheless, there are certain drawbacks to e-recruitment and e-selection that can be summarized as the duplication of resumes which could lead to neglecting real candidates, lack of authenticity, reduced accuracy of information provided, and lack of internet connection; all of which was looked at as drawbacks as limitations for the adoption of AI in HR (Tambe et al., 2019).

AI techniques such as machine learning (ML) started to have a vital role in replacing the traditional recruiting process worldwide. ML replaced time-consuming recruitment process by predicting some of job candidate's characteristics such as their personality and cognitive ability. (Grunenberg et al., 2024). Natural Language Processing (NLP) is another AI techniques that been used by huge organizations like Mahindra, Cognizant and Cap Gemini to reduce time and cost of recruiting process, these organizations receive thousands of job applications annually and without the help of AI techniques, the process of screening these applications would be inefficient and sometimes impossible (Jalota, 2024). A study by Pan et al. (2021) findings indicated that companies' perceived complexity toward AI constrains AI adoption, while technology competence and regulatory support encourage AI adoption. The study also mentioned that AI has significantly influence the workplace and offer companies the chance to gain a competitive advantage.

### **3. Research methodology**

#### **3.1. Research methods and design**

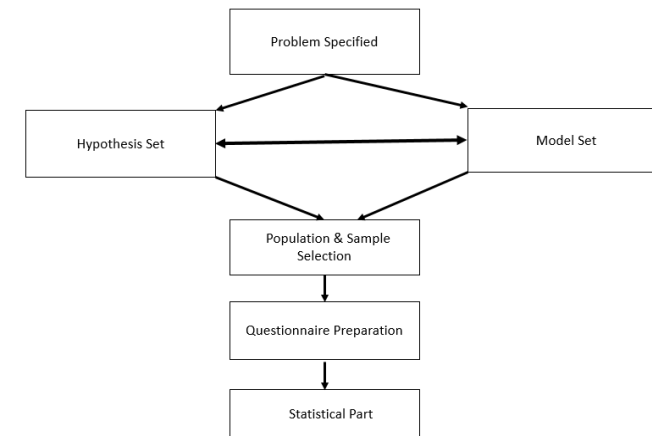
This research can be classified as a descriptive, cause-and-effect study aimed at elucidating causality between phenomena. It seeks to explore the relationship between variables by examining the co-variation or correlation between the cause and effect, and subsequently assessing the strength of this relationship. This research used quantitative methods. The model developed in this study intends to study the perceived impact of HR through AI on HRM efficiency and Organizational development effectiveness and nine hypotheses were set to study these relationships. The survey was developed and distributed in order to analyze the generated results and tested the hypotheses using statistical tools (SPSS) and (Amos) that helped in setting conclusions.

#### **3.2. Population and sample**

The targeted segment is the Jordanian Commercial Banks. Commercial Banks are financial institutions that offer a variety of services to their clients, including the acceptance of deposits, the issuance of loans, and the management of individual retirement accounts (IRAs). In addition to these core offerings, Commercial banks may also provide specialized services such as certificates of deposit (CDs), currency exchange, and safe deposit box rentals (BARONE, 2022). These institutions play a significant role in the global economy by facilitating the movement of money and credit, and they serve as essential sources of financing for individuals, companies,

and governments (BARONE, 2022). Commercial banks play a crucial role in the economy; since they generate capital and market liquidity in addition to offering their clients critical services. By giving out loans from the deposits of their customers, banks ensure market liquidity (The Economic Times , 2023).

According to data from the Central Bank of Jordan, there are currently 25 banks operating in Jordan, including 20 Commercial Banks (8 foreign, 3 Islamic, and 2 Digital Banks). This research targeted HR Departments for the of the Jordanian Commercial Banks we implemented is census method. Applying this statistical method by targeting the whole research population and collecting data from them, allowed the researchers to reach accurate and reliable result since the targeted population of this study is small (Zhang et al., 2007). Where electronically survey (Google forms) was distributed on Jordanian commercial bank with a population sum of (261) employees in the HR departments in the targeted 12 Commercial banks, so the survey was distributed to HR employees and managers in the headquarters of Jordanian Commercial Banks in Jordan. The target was the HR department in local banks and our focus was specifically on Commercial Banks, including Bank Al Etihad, ARAB Bank, Jordan Ahli Bank, Housing Bank, Capital Bank, ABC bank, Invest Bank, Jordan Bank, Cairo Amman bank, Jordan Kuwait Bank, AJIB Bank, and Jordan Commercial Bank.



**Figure 1.** Methodology diagram.

As it is mentioned in **Figure 1** above, the selection of HR departments in these banks was based on the assumption that they possess valuable insights into the utilization of AI in the banking industry (Budhwar et al., 2022). The survey was distributed electronically, using a secure and confidential platform to ensure the privacy of respondents as recommended by Li et al. (2019), in their study on the ethical considerations of online surveys. In addition to the electronic forms, there was personal visits to some of the personnel in some of the banks. In order to maximize the response rate, the survey was accompanied by a cover letter explaining the purpose of the study and the benefits of participating (following the guidelines outlined by (Dillman et al., 2014), in their work on maximizing response rates in surveys) (Dillman et al., 2014).

### 3.3. Measurement tools

In this research, our aim was to investigate the perceived impact of HR through AI on HRM Efficiency and Organizational Development Effectiveness in the Jordanian Commercial Banks. Surveys are a common method for collecting this type of data, and they allow researchers to gather a large amount of information from a diverse sample of participants in a relatively short period of time (Creswell, 2014).

The survey was designed based on the literature review; we concluded the potential and studied the impacts of AI implementation in HR in various research, as well as what kind of activities and processes were conducted in the HR functions and generated questions using these researches as the source. We visited commercial banks in Jordan and distributed the survey electronically via Google Forms. The survey was administered using a quantitative measurement tool, which involved the collection and analysis of numerical data. By distributing the survey electronically, we were able to reach a wide range of HR departments at different Jordanian Commercial banks across the country.

The survey questionnaire comprised two main parts: The first part included demographic inquiries concerning participants' gender, age, education level, position within the organization, and professional experience. The second part measured the Recruitment and Selection through AI, the HRM Efficiency and its relation with AI ease of use as a moderator, and the Organizational Development Effectiveness.

### 3.4. Measurement and scaling

The independent variable; Recruitment and selection through AI was measured using 5 items, using Abu-khaled (2020) as a source, as it is mentioned in **Table 1** below. All questions were measured using the 5-point Likert scale, which is a response scale that respondents use to answer whether they strongly disagree, disagree, neither agree or disagree, agree, or strongly agree with the statement.

**Table 1.** Measurement and scaling.

Constructs	Number of items	Measures
Recruitment and selection through AI	5	<ul style="list-style-type: none"><li>• AI helps in attracting potential candidates.</li><li>• AI helps in improving the recruiter's response time, filtering resumes, and discovering new talents quickly</li><li>• AI helps in evaluating candidates for open vacancies and predicting their success</li><li>• AI helps in reducing human biases in recruitment and selection</li><li>• AI helps in matching the right applicant with the right job</li></ul>

### 3.5. Statistical reliability and validity

Following approval by arbitrators, the survey was distributed to the Human Resource (HR) departments of all commercial banks operating in Jordan.

Reliability of the measures, or the degree to which the same outcomes can be reached using the same tools repeatedly and under consistent circumstances, were assessed (Middleton, 2019). Along with the accuracy of the generated results and the extent to which the measuring tools were capable of measuring what they were designed to measure, the validity was also be established in order to draw valid and



appropriate conclusions (Middleton, 2019). For that, Statistical Package for Social Sciences (SPSS) and (Amos) was used to measure the data that was in an excel sheet.

### **3.6. The validity of arbitrators**

In order to ensure the validity of our survey, including ensuring that the questionnaire is well-constructed and appropriate for our research purposes, several steps were implemented, first, the survey was sent to arbitrators to get their valuable feedback. The provided feedback was on the questionnaire's content and structure, which helped to ensure that it is clear, concise, and relevant to the research topic.

Based on the recommendations of the arbitrators, and the busy schedules of HR departments within the selected sample, the survey was distributed via Google Forms. To further increase the efficiency of the survey, we shortened the questions and added four questions at the beginning of the questionnaire after the demographic section; yes or no type of questions to whether the institution implements AI in Recruitment and Selection.

### **3.7. Procedures, data collection, processing, and analysis**

The survey was distributed to All Jordanian Commercial banks. Data collection was completed after two weeks of census method, and the responses were coded and analyzed using Microsoft Excel, SPSS and AMOS. Initially, 181 electronically questionnaire responds were collected, with 177 usable and valid responses received.

SPSS version 28 was used to analyze the data, AMOS version 26 was used as well to utilize multiple regression analysis to extract the model that illustrated the effect of the four independent variables on HRM efficiency. Hierarchical analysis in AMOS version 26 was used to extract the model that illustrated the moderation effect of AI ease of use on the relationship between the Recruitment and HRM efficiency.

The analysis included a respondent profile; gender, age, education, position, experience. The scaling depended on respondent point relying on the 5-point Likert scale; which ranged from respondents as either strongly disagree, disagree, neither agree nor disagree, Agree, and strongly Agree with the statements. The survey stated that respondents will be provided a protection of their privacy, and without mentioning their identity. The data was only used for research purposes, and descriptive analysis of the research variables, measurement model approaches (confirmatory factor analysis), testing the variables' reliability and validity, and testing the hypotheses of direct, indirect, and total effects were conducted.

### **3.8. Data screening**

Prior to conducting multivariate analyses on the data, it was essential to perform a process called data screening. This step involved examining the data for issues such as missing values, normality, outliers, skewness, and kurtosis in order to ensure the accuracy and reliability of the study. (Field, 2013). This resulted in eliminating 4 responses out of 181 responses due to invalidity of the data.

### 3.9. Descriptive analysis

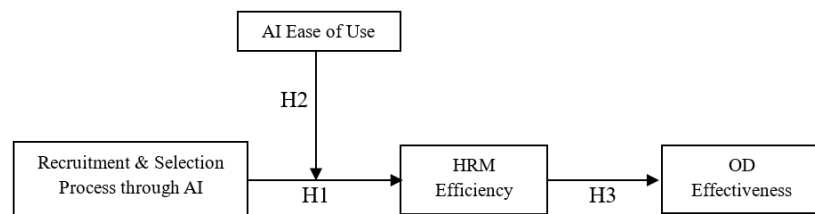
Descriptive analysis was used to summarize and present the data in a way that allowed for a comprehensive understanding of the data. Statistical parameters such as mean, minimum, maximum and standard deviation were calculated using descriptive statistics techniques (Levine, 2008).

### 3.10. Reliability analysis

The internal consistency of items measuring the same variable was assessed using reliability analysis. Generally speaking, a higher correlation between indicators (items) indicates greater measurement dependability and a lower likelihood of errors.

### 3.11. Model of the study and statistical analysis

SPSS version 28 and Amos version 26 were used to analyze data, conduct frequency analysis, descriptive analysis, test the hypothesis, and answer the research questions. Prior to the analysis, the reliability test was conducted using the value of Cronbach's Alpha. Afterwards, Multiple Regression and Hierarchical Regression analysis were used to test hypotheses and estimate the relationships between variables as it is mentioned in **Figure 2** below. The researchers used the probability value (P) and Beta to test the direct effect hypotheses, also the values of R square were estimated for each model.



**Figure 2.** Research model\*.

\* This model was developed based on Chakraborty et al. (2020) and Singh and Shaurya (2021).

### 3.12. Research ethics

Research ethics are considered as the ethical guidelines that help researchers perform and disclose research without lying or intending, whether intentionally or unintentionally, to have an impact on study participants or society as large. When doing and reporting research, it was crucial to adhere to ethical standards in order to ensure the validity of the results. (Resnik, 2020). Research ethics are extremely important for every type of research because they assist examiners and participants in taking values and morals into account throughout all stages (Oberle et al., 2019). Research ethics are procedures that aid or impede the search for and dissemination of truth (Oberle et al., 2019). Researchers identified it as essential to highlight that the questionnaire's privacy will be kept anonymous and secure. Moreover, the survey's purpose was clearly outlined, and in order for survey participants to complete the survey in less time, all variables were simply described in the survey. Finally, participants were free to participate or not engage in the study, and may withdraw from the survey without being penalized, and participants were not in danger of any kind of physical, psychological, social, or legal harm. There were no monetary

incentives provided for taking part in the study, and the findings were only used in the data analysis and results section of this study.

#### 4. Data analysis and results

The total number of respondents was 181, and the total number of accepted responses for analysis was 177 after excluding four respondents due to incompleteness. These responses represent 68% of the research population (261 targeted respondents). After collecting the samples, Statistical Package for Social Sciences (SPSS) software version 28 and (Amos) version 26 were used to analyze data and fulfill the objectives of this study. To get significant and valuable results, the researchers used several statistical techniques include frequency analysis for demographic information, descriptive analysis, reliability and validity test, Confirmatory factor analysis (CFA), KMO and Bartlett test, and regression analysis to investigate the study’s hypotheses.

##### 4.1. Demographic analysis based on AI implementation in Recruitment and Selection from respondent’s point of view

The following **Table 2** shows that around 86% of the sample implementing AI in recruiting and selecting employees in their institutions.

**Table 2.** The result of implementing AI in recruitment and selection.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	25	14.1	14.1	14.1
	Yes	152	85.9	85.9	100.0

##### 4.2. Descriptive analysis

Descriptive analysis was conducted for the variables to determine their minimum, maximum, mean, and standard deviation values. The results (**Table 3**) for the five items of the independent variable (Smooth Recruitment and Selection Process through AI) show that items R2 and R4 have the highest mean value which is 3.91, and item R1 has the lowest mean value which is 3.79 (R1: AI helps in attracting potential candidates, R2: AI helps in improving the recruiter’s response time, filtering resumes, and discovering new talents quickly, R3: AI helps in evaluating candidates for open vacancies and predicting their success, R4: AI helps in reducing human biases in recruitment and selection, R5: AI helps in matching the right applicant with the right job).

**Table 3.** Descriptive statistics of smooth recruitment & selection process through AI.

	N	Minimum	Maximum	Mean	Std. Deviation
R1	177	1	5	3.79	0.890
R2	177	1	5	3.91	0.919
R3	177	1	5	3.88	0.896
R4	177	1	5	3.91	0.894
R5	177	1	5	3.88	0.887

### 4.3. Reliability and validity

#### 4.3.1. Cronbach’s Alpha analysis

Reliability of the data using Cronbach’s Alpha analysis was conducted and the value was 0.898 as it is shown in **Table 4**. According to Wywiał (2015), the value of Cronbach’s Alpha should exceed 0.7 to ensure the reliability of the variable, and since its higher than this value, the data was reliable.

**Table 4.** Cronbach’s alpha analysis.

Variable	Number of items	Cronbach’s Alpha
Smooth Recruitment and Selection Process through AI	5	0.898

#### 4.3.2. Exploratory Factor Analysis (EFA)

Validity of the data using KMO and Bartlett’s Test was conducted and the values shown in (**Table 5**) indicate that the data was valid.

**Table 5.** KMO and Bartlett’s test.

KMO and Bartlett’s Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.922
	Approx. Chi-Square	6880.114
Bartlett’s Test of Sphericity	Df	595
	Sig.	0.000

#### 4.3.3. Reliability and validity using Confirmatory Factor Analysis (CFA)

To ensure the reliability and validity, Confirmatory Factor Analysis (CFA) by AMOS software was conducted. The values of loading factors were used to calculate the Average Variance Extracted (AVE) which is the indicator for convergent validity, furthermore, loading factors values were used to calculate the Composite Reliability (CR). Reference to the study of Hair et al. (2014), he recommended that the value of composite reliability to be equal to or greater than 0.7, and the study of Fornell and Larcker (1981) that recommended the value of (AVE) to be more than 0.5. Results shown in **Table 6** below indicate that data was reliable and valid.

**Table 6.** Confirmatory Factor Analysis (CFA).

Path	Estimate	(AVE)	(CR)	$\sqrt{AVE}$
R1 ← R	0.73			
R2 ← R	0.71			
R3 ← R	0.70	0.54	0.90	0.73
R4 ← R	0.77			
R5 ← R	0.77			

- Hypotheses testing (H1)

To test the hypotheses of direct effects between the Smooth Recruitment and Selection Process through AI and HRM Efficiency, simple regression analysis was used to evaluate if the relationship is significant, **Table 7** describes the output of this

analysis (R is recruitment and selection through AI). Probability value (*P*) was implemented to decide whether there is a significant effect between the independent variable (recruitment and selection through AI) and the mediating variable (HRM Efficiency). If the value of (*P*) is less than 0.05, that indicates a statistically significant relationship between the two variables. And the value of standardized coefficient Beta ( $\beta$ ) is used to determine the direction and strength of the relationship; if Beta ( $\beta$ ) is positive it will be a positive relationship, otherwise if it is negative, it will be a negative relationship.

**Table 7** below shows a positive significant relationship between variables ( $P = 0.000$ ,  $\beta = 0.241$ ). Therefore, H1 is supported, Smooth Recruitment and Selection Process through AI affects HRM Efficiency.

**Table 7.** Hypotheses testing between the independent and mediating variables.

Coefficients <sup>a</sup>								
Model	Unstandardized Coefficients		Standardized Coefficients		<i>t</i>	Sig.	Collinearity Statistics	
	B	Std. Error	Beta				Tolerance	VIF
1	(Constant)	0.262	0.124		2.119	0.036		
	R	0.213	0.034	0.241	6.212	0.000	0.680	1.470
				Beta		<i>P</i> -value	Direction	Decision
H1	Smooth Recruitment and Selection Process through AI				0.000	0.241	Positive	Supported

a. Dependent Variable: EHRM

• Hypotheses testing (H2)

To test the moderating effect of AI Ease of Use on the relationship between the Smooth Recruitment and Selection Process through AI and HRM Efficiency, hierarchical regression analysis was conducted after adding AI Ease of Use as a moderator to investigate its role in moderating the relationships. The result of the analysis described (**Table 8**) below shows that the effect of Smooth Recruitment and Selection Process through AI on HRM Efficiency is moderated by AI Ease of use, therefore, H2 is supported.

**Table 8.** Hypotheses testing between the independent and moderating variables.

Coefficients <sup>a</sup>								
Model	Unstandardized Coefficients		Standardized Coefficients		<i>t</i>	Sig.	Collinearity Statistics	
	B	Std. Error	Beta				Tolerance	VIF
1	(Constant)	0.262	0.124		2.119	0.036		
	R	0.213	0.034	0.241	6.212	0.000	0.680	1.470
				Beta		<i>P</i> -value	Direction	Decision
H1	Smooth Recruitment and Selection Process through AI affects HRM Efficiency				0.241	0.000	Positive	Supported

a. Dependent Variable: EHRM

• Hypotheses testing (H3)

To test the effect of HRM Efficiency on Organizational Development Effectiveness, the researchers conducted a simple regression analysis. The result of this analysis (**Table 9**) indicates that HRM Efficiency affects Organizational

Development Effectiveness at ( $P = 0.000, \beta = 0.883$ ). Thus, HRM Efficiency plays the role as a mediator between Smooth Recruitment and Selection Process through AI with Organizational Development Effectiveness. Therefore, H3 was supported.

**Table 9.** The output of simple regression analysis.

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate			
1	0.883 <sup>a</sup>	0.779	0.778	0.24571			
ANOVA <sup>b</sup>							
Model		Sum of Squares	Df	Mean Square	F	Sig.	
	Regression	37.330	1	37.330	618.301	0.000 <sup>c</sup>	
1	Residual	10.566	175	0.060			
	Total	47.895	176				
Coefficients <sup>d</sup>							
Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	0.924	0.131			7.073	0.000
	EHRM	0.881	0.035	0.883		24.866	0.000

a. Predictors: (Constant), EHRM; b. Dependent Variable: OD; c. Predictors: (Constant), EHRM; d. Dependent Variable: OD.

## 5. Discussion

Smooth Recruitment and Selection process through AI has a significant positive impact on HRM efficiency, and that aligns with the study of Kumar and Sharma (2019) as well as Hmoud (2021) that discussed how AI-based systems can significantly reduce the time and effort required for HR professionals to review and assess job applicants. By automating certain tasks, such as resume screening and initial interviews, HR professionals can focus on more high-level tasks, such as evaluating the fit of candidates within the organization and providing support during the onboarding process (Hmoud, 2021). Henceforth, AI can help to reduce bias in the recruitment process by providing objective criteria for candidate evaluation. Overall, the incorporation of AI in recruitment and selection has the potential to streamline HRM processes and improve efficiency (Kumar and Sharma, 2019).

AI ease of use has a moderation effect on the relationship between the Recruitment and selection and HRM efficiency. In addition, ease of use will encourage HR recruiters to utilize AI in the recruitment process that will result in better and quicker process.

HRM efficiency has a significant positive effect on OD effectiveness, and that aligns with the study of Minahan (2010) and Bakator et al. (2019) that elaborated on how the alignment of HR practices with the overall goals and strategies of the organization can contribute significantly to the success of OD efforts. For instance, if a company is trying to implement a new team-based structure, effective HR practices such as recruitment, selection, and training can help ensure that the necessary skills and knowledge are in place to support the change (Minahan, 2010). In general, effective HRM practices can create a positive work environment, improve employee

skills and abilities, and support organizational change, all of which can contribute to the effectiveness of OD initiatives (Bakator et al., 2019).

### **5.1. Research implications**

This study can be beneficial to decision-makers in the banking sector and even in any other business sector in which they can allocate more focus on the implementation of AI in HR functions and practices since this research studied and showed how the utilization of AI in Recruitment and Selection, has a positive effect on HRM efficiency and that in turn affects OD effectiveness. Decision-makers can further understand how their current implementation of AI has a strong significant effect on their HRM and OD, and how they should expand this implementation in the future. Further, by showing some of the pitfalls and disadvantages of AI implementation, this will help decision makers to put action to try to eliminate such negative effects or at least reduce their impacts.

This study has theoretical implications as well, it can contribute to the academic sector since it combined two models and presented a new conceptual model that haven't been presented previously. The findings that came from this research were to great extent matching with other previous researches, studies, and papers. The model and study display and connect many variables, something that can benefit other researchers to proceed in other studies, with many conclusions that could be derived since it is a rich and original research that considered many variables.

The study added to the previous studies and gave better ideas on the utilization of AI on the process of recruiting and selection in Jordanian Commercial banks, which is something that can be expanded to all banks and other companies. Furthermore, the research opens the door for further researches to cover other organizational functions than recruitment and selection, and what different relationships could be made, for example studying how the use of AI in specific organizational functions would impact organizational performance, growth or survival.

### **5.2. Research limitations**

This research was limited in scope as it only examined Jordanian commercial banks, and did not include other types of financial institutions such as credit unions, or other banks such as foreign, Islamic, or digital banks. Second, the focus of the study was solely on the Human Resource department, meaning that no information was gathered on other departments such as finance, marketing or IT within the banks. These limitations should be taken into consideration when future researches similar to our study are done.

### **5.3. Recommendations for future research**

This study took OD effectiveness as a variable, but future researches can take into consideration other variables such as organizational performance, growth and survival, etc... to be tested, as well as taking into consideration other functions and departments than HR. It is also recommended to cover other types of banks, as well as other institutions in the business sector, and to conduct a study for other countries.

Additionally, future studies can build on our research and expand in the HR functions but with other mediating and moderating variables, for instance, a different moderator variable could be the receptivity of AI, cost of AI, or management commitment to use of AI.

## 6. Conclusion

The study concluded that adapting AI in recruitment and selection processes will increase the efficiency of HRM, therefore, the OD effectiveness will be improved as well. Furthermore, the study concluded that the AI ease-of-use has a moderating role in the strength of relationship between adapting AI in recruitment and selection processes and the HRM efficiency. This study was conducted on all Jordanian commercial banks and a census method was employed to collect data.

**Author contributions:** Conceptualization, ASA, MS, LA, YH and DA; methodology, ASA, MS, LA, YH and DA; software, ASA and OAK; validation, ASA and OAK; formal analysis, ASA and OAK; investigation, ASA and OAK; resources, ASA, MS, LA, YH and DA; data curation, ASA and OAK; writing—original draft preparation, ASA, MS, LA, YH and DA; writing—review and editing, ASA, OAK, MS, LA, YH and DA; visualization, ASA and OAK; supervision, ASA; project administration, MS, LA, YH and DA; funding acquisition, ASA and OAK. All authors have read and agreed to the published version of the manuscript.

**Conflict of interest:** The authors declare no conflict of interest.

## References

- Abbas, S. M., Liu, Z., & Khushnood, M. (2023). Predicting breakthrough innovation engagement via hybrid intelligence: a moderated mediation model of self-extinction and social intelligence. *International Journal of Emerging Markets*. <https://doi.org/10.1108/ijoem-07-2022-1140>
- Abbas, S. M., Wei, L., Liu, Z., et al. (2024). How work vitality, organisational justice and job training predict job satisfaction? Evidence from emerging economies. *Middle East Journal of Management*, 11(3), 260-279.
- Abu-Khaled, N. K. (2020). The Impact of Artificial Intelligence on Employment in High-Tech Companies in the Jordanian Market. Available online: <https://meu.edu.jo/libraryTheses/The%20Impact%20of%20Artificial%20Intelligence%20on%20Employment%20.pdf> (accessed on 6 March 2024).
- Atwijuka, S., & Caldwell, C. (2017). Human resource management for competitive advantage. *COMPETITIVE ADVANTAGE*, 85.
- Bakator, M., Petrović, N., Borić, S., et al. (2019). Impact of human resource management on business performance: A review of literature. *Journal of engineering management and competitiveness (JEMC)*, 9(1), 3-13.
- Bakshi, A., & Damle, M. Using Artificial Intelligence in HR Functions for Recruitment: An Overview.
- Barone, A. (2022). How Banking Works, Types of Banks, and How To Choose the Best Bank for You. Available online: <https://www.investopedia.com/terms/b/bank.asp> (accessed on 6 March 2024).
- Budhwar, P., Malik, A., De Silva, et al. (2022). Artificial intelligence—challenges and opportunities for international HRM: a review and research agenda. *The International Journal of human resource management*, 33(6), 1065-1097.
- Burchell, S., Sehnbruch, K., Piasna, A., et al. (2012). The Quality of Employment in the Academic Literature: Definitions, Methodologies, and Ongoing Debates. Available online: [http://eprints.lse.ac.uk/102891/1/The\\_quality\\_of\\_employment\\_and\\_decent\\_work.pdf](http://eprints.lse.ac.uk/102891/1/The_quality_of_employment_and_decent_work.pdf) (accessed on 8 March 2024).
- Cameron, K. S., Quinn, R. E. (2006). *Diagnosing and changing organizational culture: Based on the competing values framework*. John Wiley & Sons.



- Chakraborty, S., Giri, A., Aich, A., et al. (2020). Evaluating Influence of Artificial Intelligence on Human Resource Management Using PLS-SEM (Partial Least Squares-Structural Equation Modeling). Available online: <https://www.ijstr.org/final-print/mar2020/Evaluating-Influence-Of-Artificial-Intelligence-On-Human-Resource-Management-Using-Pls-sem-partial-Least-Squares-structural-Equation-Modeling.pdf> (accessed on 15 January 2024).
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications, Inc.
- Cummings, T. G., & Worley, C. G. (2016). *Organization development & change*.
- Davis, F. D., Davis, F. (2015). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology.
- Deepa, R., Sekar, S., Malik, A., et al. (2024). Impact of AI-focussed technologies on social and technical competencies for HR managers—A systematic review and research agenda. *Technological Forecasting and Social Change*, 202, 123301. <https://doi.org/10.1016/j.techfore.2024.123301>
- Dessler, G. (2011). *Human Resource Management*. Pearson.
- Dijkkamp, J. (2019). *The recruiter of the future, a qualitative study in AI supported recruitment process* [Master's thesis]. University of Twente.
- Dillman, D. A., Christian, L. M., Smyth, J. D. (2014). *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*, 4th ed. John Wiley & Sons.
- Ertel, W. (2017). *Introduction to Artificial Intelligence*. Springer International Publishing AG 2017. <https://doi.org/10.1007/978-3-319-58487-4>
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*, 4th ed. Sage.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>.
- Grunenberg, E., Peters, H., Francis, M. J., et al. (2024). Machine learning in recruiting: predicting personality from CVs and short text responses. *Frontiers in Social Psychology*, 1, 1290295.
- Hair, F. Jr, J., Sarstedt, M., Hopkins, L., et al. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European business review*, 26(2), 106-121.
- Helm, J. M., Swiergosz, A. M., Haeberle, H. S., et al. (2020). Machine learning and artificial intelligence: definitions, applications, and future directions. *Current reviews in musculoskeletal medicine*, 13, 69-76.
- Henderson, J. C., & Venkatraman, N. (1990). Strategic alignment: a model for organizational transformation via information technology.
- Hmoud, B. (2021). The adoption of artificial intelligence in human resource management and the role of human resources. In: *Forum Scientiae Oeconomia*. Wydawnictwo Naukowe Akademii WSB. pp. 105-118.
- Inagaki, T., & Sheridan, T. B. (2019). A critique of the SAE conditional driving automation definition, and analyses of options for improvement. *Cognition, technology & work*, 21, 569-578.
- Istaiteyeh, R., Milhem, M. M., Najem, F., et al. (2024). Determinants of Operating Efficiency for the Jordanian Banks: A Panel Data Econometric Approach. *International Journal of Financial Studies*, 12(1), 12. <https://doi.org/10.3390/ijfs12010012>
- Jalota, G. M. *Indian Journal of Training and Development*, 52(3), 35-39
- Jenkins, S. R., Marshall, D., & Frascchetti, S. (2009). Settlement and recruitment. *Marine Hard Bottom Communities: Patterns, Dynamics, Diversity, and Change*, 177-190.
- Levine, D. M. (2008). *Statistics for managers using Microsoft Excel*, 6th ed. Pearson Education.
- Malhotra, K., Ritzman, L. P., & Srivastava, S. K. (2019). *Operations Management: Processes and Supply Chain*.
- Middleton. (2019). Reliability vs. Validity in Research | Difference, Types and Examples. Scribbr.
- Minahan, M. (2010). OD and HR. *OD Practitioner*, 42(4), 17-22.
- Oberle, K. M., Page, S. A., Stanley, F. K., & Goodarzi, A. A. (2019). A reflection on research ethics and citizen science. *Research Ethics*, 15(3-4), 1-10.
- Pan, Y., Froese, F., Liu, N., et al. (2021). The adoption of artificial intelligence in employee recruitment: The influence of contextual factors. *The International Journal of Human Resource Management*, 33(6), 1125–1147. <https://doi.org/10.1080/09585192.2021.1879206>
- Prowse, S. D. (1997). Corporate control in commercial banks. *Journal of Financial Research*, 20, 509-527.
- Refat Alfaouri, M., & Bataineh, N. (2022). The Impact of Artificial Intelligence on Recruitment Practices in Zain Jordan; A Perspective of Transforming Human Resources. *Global Scientific and Academic Research Journal of Economics, Business and Management*, 2(8), 92-97

- Resnik, D. B. (2020). What Is Ethics in Research & Why Is It Important? Available online: <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm> (accessed on 15 March 2024).
- Singh, A., & Shaurya, A. (2021). Impact of Artificial Intelligence on HR practices in the UAE. *Humanities and Social Sciences Communications*, 8(1), 1-9
- Stoilkovska, A., Ilieva, J., & Gjakovski, S. (2015). Equal employment opportunities in the recruitment and selection process of human resources. *UTMS Journal of Economics*, 6(2), 281-292.
- Sundqvist, E., Backlund, F., & Chronéer, D. (2014). What is project efficiency and effectiveness? *Procedia-Social and Behavioral Sciences*, 119, 278-287.
- Tambe, P., Cappelli, P., & Yakubovich, V. (2019). Artificial intelligence in human resources management: Challenges and a path forward. *California Management Review*, 61(4), 15-42.
- The Economic Times. (2023). What is a commercial bank. Available online: <https://economictimes.indiatimes.com/definition/commercial-bank> (accessed on 16 March 2024).
- Vrontis, D., Christofi, M., Pereira, V., et al., (2023). Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. *Artificial Intelligence and International HRM*, 172-201.
- Willassen, S. (2008). Hypothesis-based investigation of digital timestamps. In: *Advances in Digital Forensics IV 4*. Springer US. pp. 75-86.
- Wywiał, J. L. (2015). *Sampling designs dependent on sample parameters of auxiliary variables*, 1st ed. Springer-Verlag Berlin Heidelberg.
- Zhang, D., Wang, L., Lv, F., et al. (2007). Advantages and challenges of using census and multiplier methods to estimate the number of female sex workers in a Chinese city. *AIDS Care*, 19(1), 17–19. <https://doi.org/10.1080/09540120600966158>