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## The Impact of Artificial Intelligence on Employee Recruitment and Hiring: Challenges, Opportunities, and Practical Examples

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### Abstract

This study aimed to examine the impact of artificial intelligence on the recruitment and hiring process, focusing on challenges, opportunities, and successful examples. The present study is applied in terms of its objective and descriptive-survey in terms of its method. Research data were collected using the standard Technology Acceptance Questionnaire by Davis (1989) and a questionnaire on the impact of artificial intelligence on human resource management (designed based on previous studies). These questionnaires were distributed among 150 employees of the Sugarcane Research Institute. To determine the validity of the research instruments, content validity was assessed and confirmed by experts. The reliability of the questionnaires was calculated using Cronbach's alpha coefficient, with values of 0.87 for the Technology Acceptance Questionnaire and 0.84 for the questionnaire on the impact of artificial intelligence on human resource management. The collected data were analyzed using SPSS and PLS software. The results of the study showed that the use of artificial intelligence in the recruitment and hiring process can lead to cost reduction, increased decision-making accuracy, and reduced human errors. Moreover, this technology, through the automation of repetitive tasks, enables managers to focus more on improving performance and developing human resources. However, some employees expressed concerns about transparency and fairness in AI-based recruitment processes. The findings indicate that artificial intelligence is an efficient tool for optimizing recruitment processes. Nevertheless, to fully leverage this technology, it is recommended that organizations adopt a hybrid approach that includes both human evaluations and intelligent technologies to enhance efficiency while addressing employee concerns.

**Keywords:** Artificial intelligence, recruitment, employee hiring, human resource management, technology acceptance.

### 1. Introduction

Today, the digital world, with the help of technologies such as the Internet of Things (IoT), big data analytics, cloud computing, and artificial intelligence, has transformed business processes and altered recruitment and other human resource management processes (Safinia & Ghavami, 2024). Artificial intelligence is defined as software or hardware systems capable of thinking like humans and making intelligent decisions based on data (Agnihotri, 2023; Liu, 2018; Wang et al., 2021).

For several decades, hiring methods relied on traditional, non-digital approaches, where human factors played a central role in sourcing and attracting potential employees (Black & van Esch, 2020). Job seekers typically searched for job openings



physically on job boards or in print media such as newspapers. Upon finding a suitable job offer, they had to visit the hiring company and complete a physical application form (Langley et al., 2021; Najibzadeh, 2023).

During the early 2000s, more technological advancements were introduced to businesses. These innovations completely transformed recruitment by changing candidates' perspectives on hiring processes. Immediate access to information and enhanced communication allowed candidates to have significantly greater control over the recruitment process. Artificial intelligence has emerged as one of the most innovative technologies in human resource management, particularly in recruitment. AI can be highly effective by reducing or eliminating time-consuming manual tasks, automating resume screening, matching job requirements with candidates' skills, and improving the efficiency of the selection process (Smith, 2021; Sohn et al., 2020).

Human resource management (HRM) algorithms are a set of instructions and rules designed to automate various HR functions, such as recruitment, placement, training and development, compensation, and performance evaluation. These algorithms use techniques like machine learning, artificial intelligence, and data mining to analyze vast amounts of employee-related data, including resumes, job performance, surveys, and feedback (Black & Esch, 2020). The primary goal of HRM algorithms is to enhance the efficiency and effectiveness of HR processes, improve decision-making, and ultimately elevate overall organizational performance.

HRM algorithms can be classified into two broad categories: deterministic algorithms, which are used for solving problems with predefined, fixed solutions by analyzing a set of rules and constraints to identify the optimal solution for a specific problem, and probabilistic algorithms, which address problems that do not have predefined, fixed solutions and utilize machine learning techniques to analyze historical data to predict future outcomes (Black & Esch, 2020; Dam, 2021).

The term "artificial intelligence" was first introduced by John McCarthy in 1956. McCarthy defined AI as the science and knowledge of creating intelligent machines (Çetinkol, 2016). Like many other technologies, artificial intelligence presents both benefits and risks. One major challenge associated with AI-based decision-making is that its effectiveness is limited to the quality and accuracy of the data it processes. If the algorithms and input data contain biases or inaccuracies, there is a high probability that AI-based decision-making will yield misleading or flawed results (Black & Esch, 2020; Bullhorn, 2018).

The goal of human resource management is to align work and human factors within organizations and to develop human capital to enhance efficiency, productivity, and added value in business operations (Ore & Sposato, 2022). One of the essential activities of HRM is the recruitment and hiring process. The quality of an organization's human resources is often linked to the success of its hiring practices. Failure to attract a sufficient number of qualified candidates during the hiring process can lead to unfilled positions or the hiring of employees who do not meet job requirements (Issa et al., 2016).

One of the most significant innovations aimed at improving HR efficiency is the application of artificial intelligence. AI can be defined as a computer or software system capable of intelligent processing and decision-making (Khan, 2024). AI has demonstrated its impact across all business sectors, including human resource management, where it has improved recruitment processes through the adoption of new technologies. AI-based tools are increasingly expanding in recruitment. Automated screening algorithms, machine learning applications, resume and candidate profile analysis, and automated hiring processes have streamlined the early stages of recruitment (Upadhyay & Khandelwal, 2018). AI techniques in hiring include data extraction techniques that automate the identification and selection of suitable candidates (Horodyski, 2023).

Additionally, AI is capable of analyzing candidates' personalities, overall job performance, and competencies by examining textual and linguistic indicators in speech and writing (Schmid & Raveendhran, 2022). AI seeks to replicate and enhance human intelligence by reducing physical and cognitive workload through intelligent computational behavioral models, reasoning development, learning capabilities, and decision-making in complex computer systems—tasks that traditionally required human expertise (Bullhorn, 2018).

Today, software solutions powered by AI are being deployed in recruitment markets to help employers screen large volumes of applications and identify the most suitable candidates. In fact, AI-powered hiring solutions are among the most widely used recruitment methods in the modern era. Examples of such software include Textkernel and Resume Matcher SAP. Textkernel



rapidly scans thousands of job applications, while Resume Matcher compares applicants with job descriptions and Wikipedia job definitions, ranking candidates based on job fit (Lam & Oshodi, 2016).

With the help of AI, recruiters can efficiently gather data on candidates' suitability for job positions. Repetitive and monotonous tasks are being automated, as AI takes over the handling of routine recruitment procedures (Karaboga & Vardarlier, 2021). Automated candidate ranking systems have been proposed to accelerate the hiring process.

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In traditional hiring processes, recruiters initially assess candidates' professional and academic qualifications based on their credentials, such as degrees and certifications, primarily evaluating technical skills. To further assess suitability, candidates may be required to undergo practical tests. However, this approach does not necessarily provide a comprehensive understanding of a candidate's long-term success in a given role. Today, businesses that have adopted modern management approaches are shifting toward scientific and objective recruitment management using technology-based methods. Studies show that AI accelerates recruitment processes, saves time and costs, and enables more precise candidate ranking. The role of AI in recruitment can be summarized as follows (Karaboga & Vardarlier, 2021).

Given that every tool, despite its advantages, can pose challenges for users, this study seeks to explore the opportunities and challenges associated with the adoption of artificial intelligence in human resource recruitment processes.

## 2. Methods and Materials

This study aimed to examine the impact of artificial intelligence on the employee recruitment and hiring process in organizations. Given the growing importance of intelligent technologies in human resource management, this study sought to identify and analyze the challenges, opportunities, and successful examples of AI application in recruitment processes. The present study is applied in terms of its objective and descriptive-survey in terms of its methodology. Data were collected using two standardized questionnaires, including Davis's (1989) Technology Acceptance Questionnaire and a questionnaire designed based on previous studies on the impact of artificial intelligence on human resource management. These questionnaires were distributed among employees of the Sugarcane Research Institute. Since the study required both quantitative and qualitative data, a simple random sampling method was chosen to enhance the generalizability of the research findings. The sample size was determined using Cochran's formula, resulting in the selection of 150 employees from the institute. This sample size ensured sufficient data for conducting statistical analyses.

To ensure the validity and reliability of the data collection instruments, multiple methods were employed. Content validity of the questionnaires was assessed by five experts in human resource management and information technology, and necessary modifications were made based on their feedback. The reliability of the research instruments was evaluated using Cronbach's alpha coefficient, yielding values of 0.87 for the Technology Acceptance Questionnaire and 0.84 for the questionnaire on the impact of artificial intelligence on human resource management, indicating acceptable reliability levels.

After data collection, statistical analyses were performed using SPSS and PLS software. Descriptive statistics were used to examine the demographic characteristics of respondents, including gender, age, education level, work experience, and familiarity with AI technologies. Inferential statistical methods were then employed to analyze relationships between variables and test research hypotheses. Pearson's correlation analysis was used to assess relationships between AI acceptance and its impact on recruitment processes. Confirmatory factor analysis (CFA) was conducted to verify the construct validity of the questionnaires, and the research measurement model was confirmed. Structural equation modeling (SEM) in PLS was used to examine the relationships between variables and test the research hypotheses.

## 3. Findings and Results

Demographic data from the 150 respondents at the Sugarcane Research Institute were analyzed, revealing that the majority of respondents were male (60%) and aged between 30 and 40 years (40%). The most common education level was a master's degree (40%), and most respondents had 11 to 20 years of work experience (33.3%).

The variables were analyzed using mean, standard deviation, skewness, and kurtosis, as shown in Table 1.

**Table 1. Descriptive Statistics**

Variable	N	Mean	SD	Skewness	Kurtosis
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Technology Acceptance (TAM)	150	3.92	0.87	-0.34	0.71
AI Impact on Recruitment	150	4.15	0.79	-0.22	0.65
AI Impact on Hiring Accuracy	150	4.02	0.83	-0.41	0.80
Employee Concerns	150	3.48	0.91	0.27	-0.54

The mean score of the technology acceptance variable (3.92) indicates that most respondents have a positive and above-average attitude toward using AI in their work processes. This suggests that modern technologies are perceived as effective tools for improving productivity and efficiency, particularly in human resource recruitment and hiring. This acceptance is likely due to employees' familiarity with new technologies, positive past experiences with their applications, and the organization's emphasis on digitalizing administrative and managerial processes. The results also show that employees recognize the benefits of AI in reducing human error and increasing the accuracy of decision-making processes, while concerns about AI replacing human workers do not significantly hinder technology acceptance.

However, the employee concerns variable had the lowest mean score (3.48), indicating that some employees still have reservations about using AI in recruitment and evaluation processes. These concerns may stem from fears of job loss, excessive reliance on algorithmic data without considering human factors, or a lack of transparency in automated decision-making processes. Additionally, some employees may feel that AI systems cannot accurately assess qualitative attributes and soft skills, which are particularly important in jobs requiring human interaction and creative decision-making. Thus, while the mean technology acceptance score is relatively high, these concerns pose a challenge to broader AI adoption in organizational processes.

Statistical analysis shows that the skewness and kurtosis values for all variables fall within the normal range, indicating a relatively balanced data distribution. Normal data distribution is essential for conducting many inferential statistical tests and enhances the validity of statistical analyses. Low skewness values indicate that the data are relatively symmetrical without significant bias toward higher or lower values. The kurtosis values, close to the standard range, suggest that data dispersion is normal, with no unusual clustering of values at the center or ends of the spectrum. These characteristics ensure the validity of the statistical methods used and enable meaningful interpretations of the data. Overall, the collected data demonstrate high suitability for advanced analyses such as structural equation modeling and regression analysis, allowing for more precise examination of causal relationships between variables.

The reliability of the questionnaire was assessed using Cronbach's alpha coefficient, and the results are presented in Table 2.

**Table 2. Reliability Test**

Variable	Number of Items	Cronbach's Alpha
Technology Acceptance (TAM)	8	0.87
AI Impact on Recruitment	6	0.84
AI Impact on Hiring Accuracy	5	0.86
Employee Concerns	4	0.82

The reliability of the research instruments was confirmed using Cronbach's alpha, with all calculated values above 0.7. This finding indicates that the questionnaires used had high reliability and that the items for each variable effectively measured the intended concepts. A high Cronbach's alpha value signifies good internal consistency, meaning that respondents provided consistent answers to the questions related to each variable. This enhances the credibility of the results and indicates that the collected data are highly reliable for advanced statistical analyses. Convergent and discriminant validity were also assessed using the average variance extracted (AVE) method and the heterotrait-monotrait ratio (HTMT). AVE analysis results showed that all variables had values above 0.5, indicating convergent validity and confirming that the items related to each variable explained a satisfactory amount of variance for that variable. High AVE values suggest that the research constructs accurately measured the intended concepts, with strong correlations between items within each variable.

Discriminant validity was assessed using HTMT as a standard criterion. The results showed that all HTMT values were below 0.9, indicating that the research variables were distinct from each other with no significant overlap. This confirms that each variable retained its unique characteristics, and the items for each variable were distinct from items related to other variables. In summary, the convergent and discriminant validity assessments demonstrated that the research instruments had



sufficient accuracy in measuring the intended concepts, and the measurement model was suitably valid for advanced statistical analyses.

To test the research hypotheses, the PLS-SEM model was executed. The path analysis results are shown in Table 3.

**Table 3. Hypotheses Testing by Path Analysis**

Hypothetical Path	Path Coefficient ( $\beta$ )	t-Value	p-Value	Test Result
Technology Acceptance $\rightarrow$ AI Impact on Recruitment	0.491	7.23	0.001	Confirmed
Technology Acceptance $\rightarrow$ AI Impact on Hiring Accuracy	-0.257	6.15	0.002	Confirmed
Employee Concerns $\rightarrow$ Technology Acceptance	0.949	4.89	0.003	Confirmed

The path analysis results indicate that technology acceptance significantly impacts the use of artificial intelligence in recruitment processes. The path coefficient ( $\beta$ ) of 0.491 and t-value of 7.23 indicate statistical significance, with a p-value of 0.001 confirming this effect. This suggests that higher technology acceptance within organizations can lead to greater utilization of AI in recruitment processes, potentially improving process efficiency. The relationship between technology acceptance and AI's impact on hiring accuracy showed a negative effect. The path coefficient of -0.257, t-value of 6.15, and p-value of 0.002 indicate statistical significance, suggesting that, in certain conditions, AI usage in hiring processes may reduce accuracy due to algorithmic errors, insufficient data, or the inability of AI to accurately assess qualitative attributes of candidates.

Employee concerns significantly influenced technology acceptance, with a path coefficient of 0.949, t-value of 4.89, and p-value of 0.003, indicating statistical significance. This suggests that increased employee concerns may negatively affect technology acceptance, as employees worried about job displacement, unfamiliarity with AI, or automation replacing human roles may resist adopting new technologies.

Overall, these findings highlight the importance of technology acceptance in organizations and its positive and negative effects on recruitment processes. Employee concerns play a crucial role in technology acceptance, suggesting that organizations should implement strategies to mitigate these concerns, enhance employee awareness, and provide training to optimize the use of new technologies.



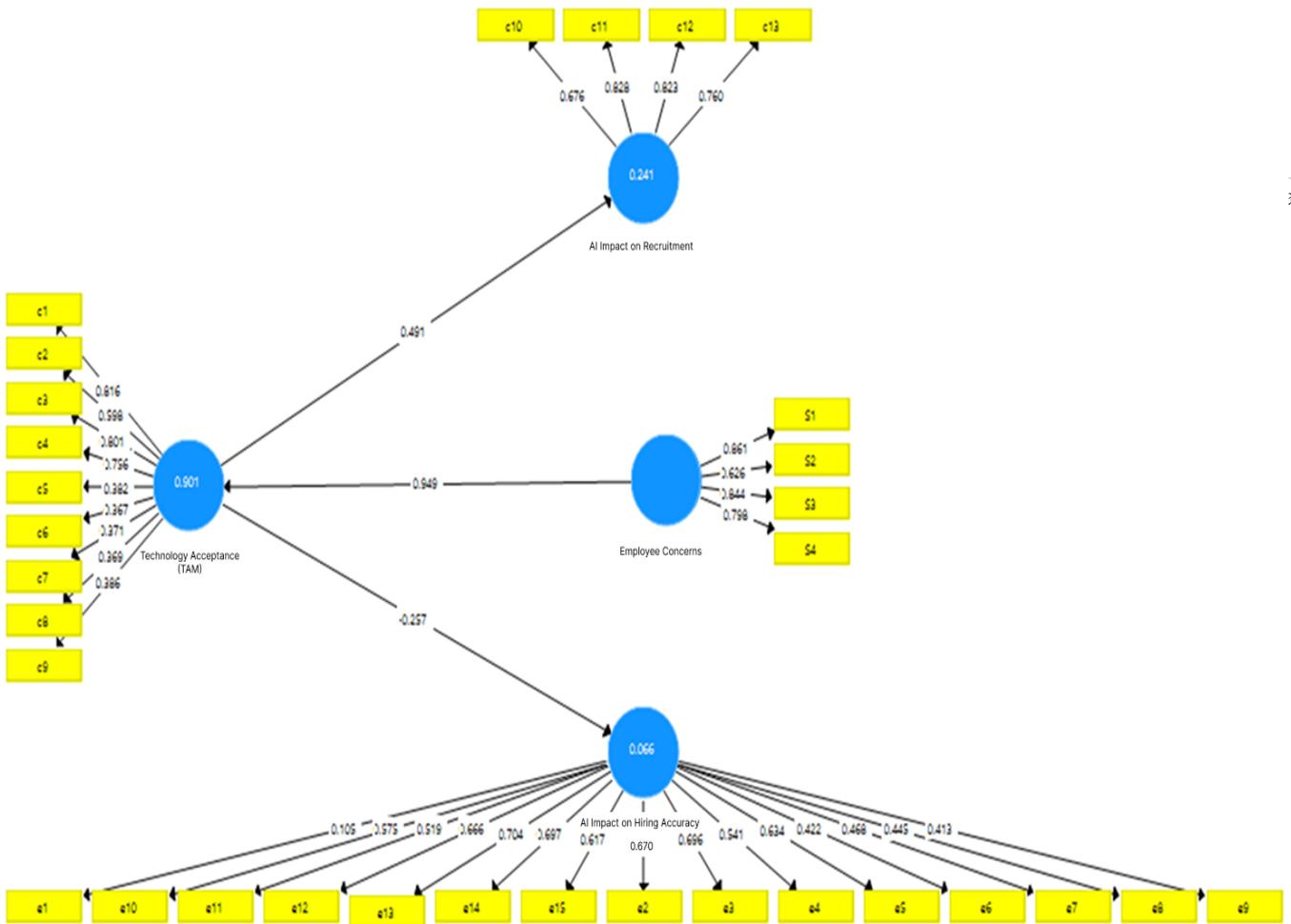


Figure 1. Final Model of the Study

#### 4. Discussion and Conclusion

The findings of this study indicate that the adoption of artificial intelligence in recruitment and hiring processes significantly influences organizational efficiency and decision-making accuracy. The results showed that technology acceptance positively impacts the implementation of AI in recruitment, as evidenced by a significant path coefficient ( $\beta = 0.491$ ,  $p = 0.001$ ). This suggests that as organizations become more accepting of AI-driven technologies, they are more likely to integrate AI into their hiring practices, potentially enhancing the efficiency of talent acquisition. The study also found that AI’s impact on hiring accuracy was negatively correlated with technology acceptance ( $\beta = -0.257$ ,  $p = 0.002$ ), indicating that while AI improves efficiency, it may also introduce certain inaccuracies in candidate selection. Employee concerns were also found to have a strong and significant effect on technology acceptance ( $\beta = 0.949$ ,  $p = 0.003$ ), suggesting that employees who perceive AI as a potential threat to job security or fairness are less likely to accept its implementation in recruitment processes.

These results align with previous studies that have highlighted both the advantages and challenges of AI in recruitment. AI-driven hiring systems are known to enhance efficiency by automating repetitive tasks such as resume screening and initial candidate assessments (Upadhyay & Khandelwal, 2018). This automation reduces human bias in hiring decisions and allows recruiters to focus on strategic HR functions (Schmid & Raveendhran, 2022). Similar findings have been reported by Liu et al. (2018), who emphasized that organizations that embrace AI in HR practices often experience improved recruitment efficiency and cost reduction. However, consistent with the negative correlation observed in this study, AI’s reliance on algorithms can sometimes lead to inaccurate candidate assessments due to biases in training data or a lack of human intuition in evaluating qualitative skills (Horodyski, 2023).



The concern regarding AI's potential impact on hiring accuracy has been a topic of debate in HR research. Some scholars argue that AI can outperform human recruiters in objective assessments by reducing subjective biases (Black & Esch, 2020). However, research also suggests that AI may struggle with assessing soft skills, personality traits, and cultural fit, which are critical factors in hiring decisions (Ore & Sposato, 2022). This aligns with the current study's finding that AI may reduce hiring accuracy in certain conditions. For instance, AI screening tools may fail to recognize the nuanced qualifications of candidates, leading to suboptimal hiring decisions (Issa et al., 2016). McCarthy's (1956) foundational work on artificial intelligence acknowledged the challenges of machine-based decision-making, emphasizing that while AI can enhance efficiency, it requires careful calibration to ensure fair and accurate outcomes (Çetinkol, 2016).

The study also highlights employee concerns as a significant factor influencing technology acceptance. Many employees fear that AI will replace human roles, particularly in administrative and HR-related positions, leading to resistance to AI adoption. This finding is consistent with the research by Khan (2024), which found that employees often express skepticism about AI-driven recruitment due to concerns about job security and fairness (Khan, 2024). AI-based hiring processes, when not properly designed, can reinforce biases present in historical hiring data, leading to discriminatory hiring practices (Karaboga & Vardarlier, 2021). Upadhyay and Khandelwal (2018) suggest that organizations must balance AI integration with human oversight to mitigate these concerns and enhance AI's credibility in recruitment (Upadhyay & Khandelwal, 2018).

In line with previous studies, this research confirms that AI adoption in recruitment is most effective when combined with human judgment. AI excels at handling large volumes of applications and identifying patterns, but human recruiters provide essential contextual judgment that AI lacks (Sohn et al., 2020). Research by Bullhorn (2018) supports this conclusion, noting that while AI speeds up hiring, human involvement remains necessary to ensure fairness and inclusivity (Bullhorn, 2018). This aligns with the argument by Karaboga and Vardarlier (2021) that AI should be used as an augmentation tool rather than a replacement for human recruiters (Karaboga & Vardarlier, 2021).

Another key finding of this study is that AI's potential for bias remains a concern. Research has shown that AI algorithms can unintentionally perpetuate biases if they are trained on historical hiring data that reflect past discriminatory practices (Schmid & Raveendhran, 2022). This issue has been extensively studied in the field of HR analytics, with scholars emphasizing the need for transparent and explainable AI models to ensure fair hiring decisions (Lam & Oshodi, 2016). Our findings support this argument, highlighting that AI adoption should be accompanied by rigorous ethical guidelines and regular audits of AI-driven recruitment systems to identify and mitigate bias (Ore & Sposato, 2022).

Despite these challenges, AI presents significant opportunities for improving recruitment outcomes when implemented effectively. Research by Liu et al. (2018) and Smith (2021) highlights how AI can enhance candidate experience through personalized job recommendations, automated interview scheduling, and real-time feedback (Liu, 2018; Smith, 2021). AI-based chatbots and virtual assistants are increasingly being used to streamline candidate interactions, improving employer branding and engagement (Horodyski, 2023). These advantages suggest that organizations should focus on AI training and education to ensure both recruiters and job seekers understand how to leverage AI-driven recruitment tools effectively (Khan, 2024).

The findings of this study contribute to the growing body of literature on AI in HR by providing empirical evidence on the factors influencing AI adoption in recruitment. The study confirms previous research that highlights the dual nature of AI—offering both efficiency gains and ethical challenges (Dam, 2021). It underscores the need for a balanced approach that integrates AI capabilities with human expertise to maximize recruitment effectiveness while addressing concerns related to fairness, accuracy, and employee acceptance.

One of the limitations of this study is the reliance on self-reported data, which may introduce response bias. Participants' perceptions of AI adoption and its impact on recruitment processes may not fully reflect actual organizational practices. Additionally, the study was conducted within a single industry context, which may limit the generalizability of the findings to other sectors. Future research should explore AI adoption in recruitment across diverse industries and geographic regions to



provide a more comprehensive understanding of its impact. Longitudinal studies could also be conducted to examine how AI adoption in recruitment evolves over time.

Future research should explore the role of explainable AI (XAI) in recruitment to enhance transparency and trust in AI-driven hiring processes. Studies should also investigate the long-term effects of AI implementation on workforce diversity and inclusion. Another area of research could focus on employee training programs to improve AI literacy and reduce resistance to AI adoption. The impact of AI on different stages of recruitment, from job posting optimization to final candidate selection, should also be examined in greater depth.

In practice, organizations should implement AI recruitment tools as complementary rather than standalone systems. AI should assist recruiters by automating administrative tasks while leaving final hiring decisions to human judgment. Regular audits should be conducted to ensure AI-driven recruitment tools adhere to ethical standards and do not reinforce biases. Organizations should also invest in employee training programs to enhance AI acceptance and address concerns about job security. AI integration should be accompanied by clear communication strategies to foster trust and transparency in recruitment processes.

### Ethical Considerations

All procedures performed in this study were under the ethical standards.

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### Conflict of Interest

The authors report no conflict of interest.

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