Management Strategies and Engineering Sciences 2025; 7(1):15-23


# The Role of Artificial Intelligence in Improving Recruitment and Selection Processes in Public Sector Organizations

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**Received:** 2024-09-05 **Reviewed:** 2024-10-02 **Revised:** 2024-10-30 **Accepted:** 2025-01-22 **Published:** 2025-03-26

**Abstract**

The present study aimed to examine the role of artificial intelligence (AI) in improving recruitment and selection processes in public sector organizations. This research is quantitative and descriptive-correlational in nature. The goal of such research is to investigate the relationships and correlations between the independent variable (artificial intelligence) and the dependent variable (improvement of recruitment and selection processes). The statistical population of this study consisted of all human resource employees and managers in public sector organizations in Tehran. Considering the use of the minimum sample size required for structural equation modeling, 256 respondents were included in the sample, and questionnaires were distributed among them. Six questionnaires were excluded due to incomplete responses, and statistical analyses were conducted on the remaining 250 respondents, who were selected using a multi-stage cluster sampling method. To collect data, both library and field research methods were employed, using a standardized questionnaire as the data collection tool. To assess the validity of the questionnaire, face validity, content validity, and construct validity were employed. Furthermore, reliability was measured using Cronbach's alpha coefficient, composite reliability, and McDonald's omega. Descriptive and inferential statistical methods were used in this study. In the inferential statistics section, structural equation modeling was employed using SmartPLS V3 software (2016). The findings indicated that artificial intelligence and its components (AI management, AI-based decision-making, AI infrastructure, AI skills, and AI adoption propensity) had a significant and positive effect on improving recruitment and selection processes in public sector organizations.

***Keywords:*** *Artificial Intelligence, Human Resource Management, Recruitment and Selection*

**How to cite this article:**
Okati H. (2025). The Role of Artificial Intelligence in Improving Recruitment and Selection Processes in Public Sector Organizations. Management Strategies and Engineering Sciences, 7(1), 15-23.

## 1. Introduction

The role of artificial intelligence (AI) in improving recruitment and selection processes in public sector organizations is a significant research topic, as organizations in the modern era aim to enhance efficiency and reduce costs. According to recent reports, the use of AI in recruitment processes can reduce the time required for hiring by up to 75% and improve the accuracy of selection decisions [1]. Globally, 83% of organizations are seeking to implement AI technologies in their recruitment processes. These statistics underscore the necessity and importance of addressing this topic, as improving recruitment processes can enhance workforce quality and organizational performance [2].

Today, public sector organizations face numerous challenges in recruitment and selection processes. These challenges include a lack of transparency, time-consuming procedures, and high costs, which can lead to poor hiring decisions and reduced efficiency. With the rapid advancements in AI, this technology presents an effective solution to these issues. Moreover, given that public sector organizations often face economic and social pressures, AI can contribute to improved transparency and accuracy in selection decisions. Thus, examining the role of AI in these processes is both a scientific and practical imperative [3-6].

The role of AI in improving recruitment and selection processes in public sector organizations is evident. AI can analyze applicant data to identify hidden patterns and help select the most suitable candidates for employment. For instance, machine learning algorithms can identify applicants' skills and experiences and compare them with job requirements, thereby facilitating the selection process [7]. Additionally, the use of chatbots and automated systems for interacting with applicants can reduce response times and create a better applicant experience [8].

Furthermore, AI can enhance transparency and fairness in recruitment processes. For example, AI algorithms can mitigate human biases, ensuring that decisions are made based on merit and skills [9]. This is particularly crucial for public sector organizations, which must adhere to principles of social justice and transparency. Consequently, AI can serve as an effective tool for improving the quality of recruitment and selection processes in public sector organizations.

Despite the significant advantages of AI in recruitment processes, there are several challenges that must be addressed. A primary concern is the issue of privacy and data security. Collecting and analyzing applicants' personal data pose serious risks to privacy, potentially violating individual rights [10]. Therefore, public sector organizations must carefully decide how to use and store data and establish appropriate policies to protect applicants' privacy.

Another challenge is algorithmic bias, which can lead to flawed decisions. AI algorithms may be influenced by historical data and existing biases, perpetuating inequalities in recruitment processes [11]. Thus, continuous monitoring and evaluation of algorithms are necessary to ensure fairness and transparency in recruitment processes. These challenges are critical and require thorough examination.

Factors influencing the improvement of recruitment and selection processes in public sector organizations include organizational culture, employee training and empowerment, and IT infrastructure. Organizational culture significantly impacts the adoption and use of AI in recruitment processes. Organizations that promote a culture of innovation and technology adoption are more likely to succeed [12]. Additionally, training and empowering employees in using AI tools can enhance processes and ensure that employees effectively utilize these technologies. IT infrastructure also plays a key role in the successful implementation of AI in recruitment processes. Public sector organizations must have access to suitable infrastructure and advanced technologies to leverage AI’s benefits [11]. This is particularly important in countries still in the early stages of digitalization. Therefore, addressing these factors can improve recruitment and selection processes in public sector organizations.

The poor conditions and challenges in using AI for recruitment and selection in public sector organizations can lead to several negative outcomes. For example, failure to protect privacy and data security can erode public trust in government organizations. This not only negatively impacts recruitment processes but may also reduce public participation in government initiatives [2]. Additionally, algorithmic biases can exacerbate social and economic inequalities. If recruitment processes are designed to favor certain groups, it can lead to public dissatisfaction and increased social tensions [13]. These challenges affect not only social dimensions but also have economic consequences, as poor hiring decisions can decrease efficiency and increase costs in public sector organizations.

To address the existing challenges in using AI for recruitment and selection in public sector organizations, appropriate policies and legal and ethical frameworks need to be developed. Furthermore, training and empowering

employees to use AI and monitoring recruitment processes can help reduce these challenges. Ultimately, the research question is: How can AI be utilized to improve recruitment and selection processes in public sector organizations while mitigating privacy concerns and algorithmic biases?

## 2. Methodology

This research is a quantitative, descriptive-correlational study. The aim is to examine the relationships and correlations between the independent variable (artificial intelligence) and the dependent variable (improvement of recruitment and selection processes). The study seeks to identify and analyze the impacts of AI on recruitment and selection processes in public sector organizations. The statistical population consists of all human resource employees and managers in public sector organizations in Tehran. Klein (2015) states that for simple models, a minimum sample size of 100 participants is required, while for more complex models, at least 200 participants are needed. In his extensive body of work, Klein consistently recommends a minimum sample size of 200 participants when structural equation modeling is used. Other prominent theorists in the field of structural equation modeling suggest that a minimum sample size of 200 participants is a general rule of thumb for such analyses. However, it is important to note that larger sample sizes increase statistical power, accuracy, and the generalizability of results.

Accordingly, in this study, 256 respondents were included as the sample size, considering the minimum sample size requirement for structural equation modeling. Questionnaires were distributed among these respondents, and six questionnaires were excluded due to incomplete responses. Statistical analyses were performed on the remaining 250 respondents, who were selected through multi-stage cluster sampling.

To collect data, both library and field research methods were employed. This dual approach aimed to gain a deeper understanding of the topic and derive valid models, contributing to the advancement of knowledge in this area. In the first stage, the researcher identified and selected credible academic sources, including books, scientific articles, theses, and research reports, which explored existing theories, models, successful practices, and challenges in the field. Renowned national and international academic databases were utilized. Domestic sources, such as articles and university theses, were also reviewed to understand the current state comprehensively.

In the field research phase, a standardized questionnaire was employed. To measure AI, the scale by Faraji et al. (2023) was used, comprising five components: AI management (3 items), AI-based decision-making (4 items), AI infrastructure (5 items), AI skills (5 items), and AI adoption propensity (5 items). For recruitment and selection processes, the standardized Armstrong questionnaire (1991), consisting of four items, was utilized.

The validity of the questionnaire was assessed through face validity, content validity, and construct validity. For face validity, the questionnaires were reviewed by a few sample members and subject matter experts before distribution. Content validity was evaluated using Lawshe's content validity ratio (CVR) and content validity index (CVI) with the assistance of ten experts. The questionnaire's content was reviewed for redundancy and item refinement. The CVI scores indicated that all items were deemed appropriate concerning simplicity, clarity, and relevance (with scores above 0.79), while CVR scores exceeded the 0.62 threshold, indicating no items required removal.

Construct validity was confirmed through convergent and discriminant validity using SmartPLS 3. The results demonstrated strong construct validity. Reliability was measured using Cronbach's alpha, composite reliability (CR), and McDonald's omega (ω). All dimensions achieved reliability coefficients above 0.70, indicating that the measurement tools were robust.

**Table 1.** Validity and Reliability Results for the Main Questionnaire

| Component | α | CR | ω | AVE | MSV | ASV | HTMT |
|---|---|---|---|---|---|---|---|
| Artificial Intelligence | 0.73 | 0.80 | 0.83 | 0.56 | 0.41 | 0.23 | 0.68 |
| AI Management | 0.78 | 0.82 | 0.85 | 0.58 | 0.43 | 0.25 | 0.64 |
| AI-Based Decision-Making | 0.72 | 0.81 | 0.82 | 0.64 | 0.46 | 0.30 | 0.73 |
| AI Infrastructure | 0.75 | 0.79 | 0.84 | 0.61 | 0.45 | 0.29 | 0.71 |
| AI Skills | 0.71 | 0.83 | 0.85 | 0.59 | 0.44 | 0.27 | 0.74 |
| AI Adoption Propensity | 0.74 | 0.84 | 0.87 | 0.65 | 0.47 | 0.32 | 0.65 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Recruitment and Selection | 0.75 | 0.85 | 0.83 | 0.66 | 0.43 | 0.38 | 0.75 |

The AVE values for all components significantly exceeded 0.5, indicating that more than half of the variance for each dimension was explained by its corresponding items, confirming convergent validity. The MSV and ASV values for all components were effectively lower than their AVE values, establishing discriminant validity. These results affirm that each dimension independently and effectively measures its construct with minimal interference.

Descriptive and inferential statistical methods were employed in this study. In the descriptive analysis, demographic characteristics such as age, gender, education, and work experience were described using percentages, frequencies, tables, and charts. Research variables were analyzed using mean, standard deviation, skewness, and kurtosis via IBM SPSS Statistics Version 23 (2015).

In the inferential analysis, structural equation modeling (SEM) was conducted using SmartPLS-V3 (2016). This software allows researchers to empirically test theoretical models by analyzing the relationships between observed and latent variables. The choice of SmartPLS-V3 was due to the model's complexity, encompassing numerous observed and latent variables.

## 3. Findings and Results

In this section, the research data are analyzed and evaluated using scientific methods. Initially, the demographic characteristics of the respondents were examined. According to the findings, 32% of employees are under 40 years old, 34% are aged between 40 and 45 years, 23% are between 46 and 50 years, and 11% are over 50 years old. These results indicate that the highest frequency is in the 40-45 age group, while the lowest is in the over-50 group.

Regarding work experience, 12% of employees have less than 5 years of experience, 29% have 5-10 years, 32% have 11-15 years, and 27% have over 15 years. These findings suggest that the highest frequency is in the 11-15 years group, while the lowest is in the less-than-5-years category.

Table 2 presents the central tendency and dispersion indicators for the research variables. The minimum and maximum values for each variable are 1 and 5, respectively.

**Table 2.** Statistical Characteristics of Research Variables

| Component | Mean | Standard Deviation | Skewness | Kurtosis |
|---|---|---|---|---|
| Artificial Intelligence | 3.210 | 0.668 | 0.759 | -0.173 |
| AI Management | 3.014 | 0.764 | 0.597 | -0.299 |
| AI-Based Decision-Making | 3.503 | 0.645 | 0.460 | -0.452 |
| AI Infrastructure | 3.344 | 0.718 | 0.556 | -0.314 |
| AI Skills | 3.345 | 0.721 | 0.555 | -0.378 |
| AI Adoption Propensity | 3.157 | 0.889 | 0.391 | -0.079 |
| Recruitment and Selection | 3.455 | 0.653 | 0.471 | -0.454 |

Table 2 shows the statistical indicators, including mean, standard deviation, skewness, and kurtosis, for the research variables. Given that the skewness and kurtosis values fall within the acceptable range (-2 to +2), the normality of the data can be assumed. Based on the results, AI-based decision-making has the highest mean, while AI management has the lowest.

To examine the model, structural equation modeling (SEM) was used. Before implementing SEM, parametric tests, including Pearson correlation, were conducted due to the interval scale and normal distribution of data. The results are presented in the table below.

**Table 3.** Correlation Between Variables

| Variable | Artificial Intelligence | Recruitment and Selection | Significance |
|---|---|---|---|
| Artificial Intelligence | 1.000 | 0.769** | 0.000 |
| Recruitment and Selection | 0.757** | 1.000 | 0.000 |

The ** symbol indicates a significant correlation between the research variables at the 0.01 level, demonstrating a direct relationship between the variables. The strength of these relationships can also be observed in the table.

To confirm the causal relationships among endogenous and exogenous variables and the model's fit with the data, path analysis was conducted using SmartPLS. The results are presented as path diagrams and model fit indices.

**Model Fit Indices:**

1. **Coefficient of Determination ($R^2$):** The $R^2$ value indicates the effect of an independent variable on a dependent variable. Values of 0.19, 0.33, and 0.67 represent weak, moderate, and strong effects, respectively. For recruitment and selection, $R^2$ was calculated as 0.739, indicating a strong effect.
2. **Average Variance Extracted (AVE):** This measure indicates how much of the variance in items is explained by their corresponding constructs. An AVE value of 0.59 was calculated, confirming convergent validity.
3. **Goodness of Fit Index (GOF):** The GOF value for the main hypothesis model was greater than 0.6, indicating an adequate model fit.
4. **Predictive Relevance ($Q^2$):** $Q^2$ measures the predictive power of the model for dependent variables. Values of 0.02, 0.15, and 0.35 represent low, medium, and high predictive power, respectively. The $Q^2$ values for the sub-models ranged between 0.216 and 0.36, indicating satisfactory predictive power.
5. **Normed Fit Index (NFI):** NFI values above 0.9 indicate a well-fitted model. The NFI for this model was 0.995, showing a 90% improvement in fit.

Based on these findings, the tested model demonstrates an appropriate fit for the sample under investigation. Furthermore, as all factor loadings for the observed variables were above 0.4 and their significance values exceeded 1.96, the constructs exhibit satisfactory validity.

Additionally, all sub-hypotheses of the research were confirmed. It can be concluded that AI components have a significant and positive impact on improving recruitment and selection processes.

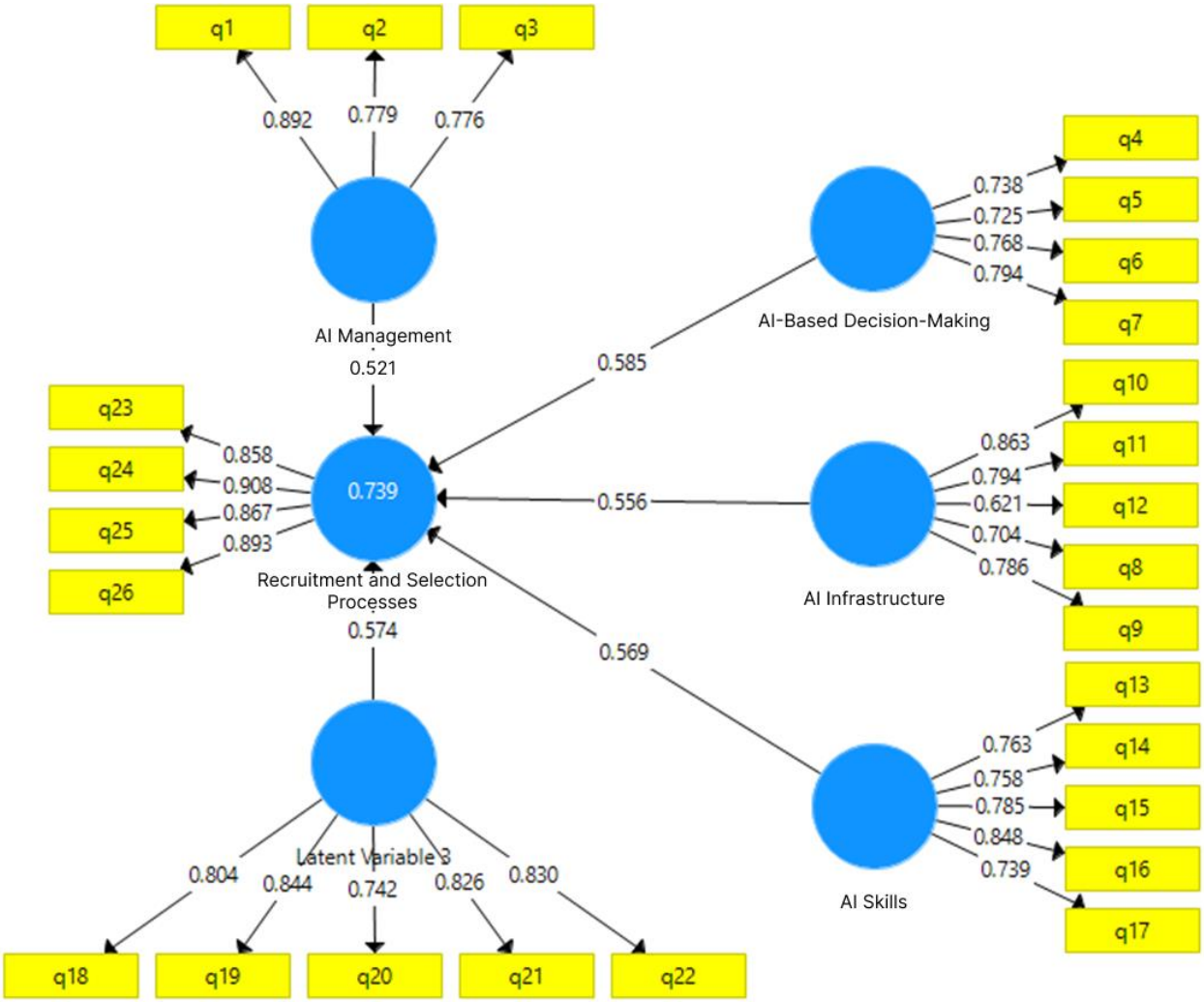


**Figure 1.** Model with Standard Coefficients

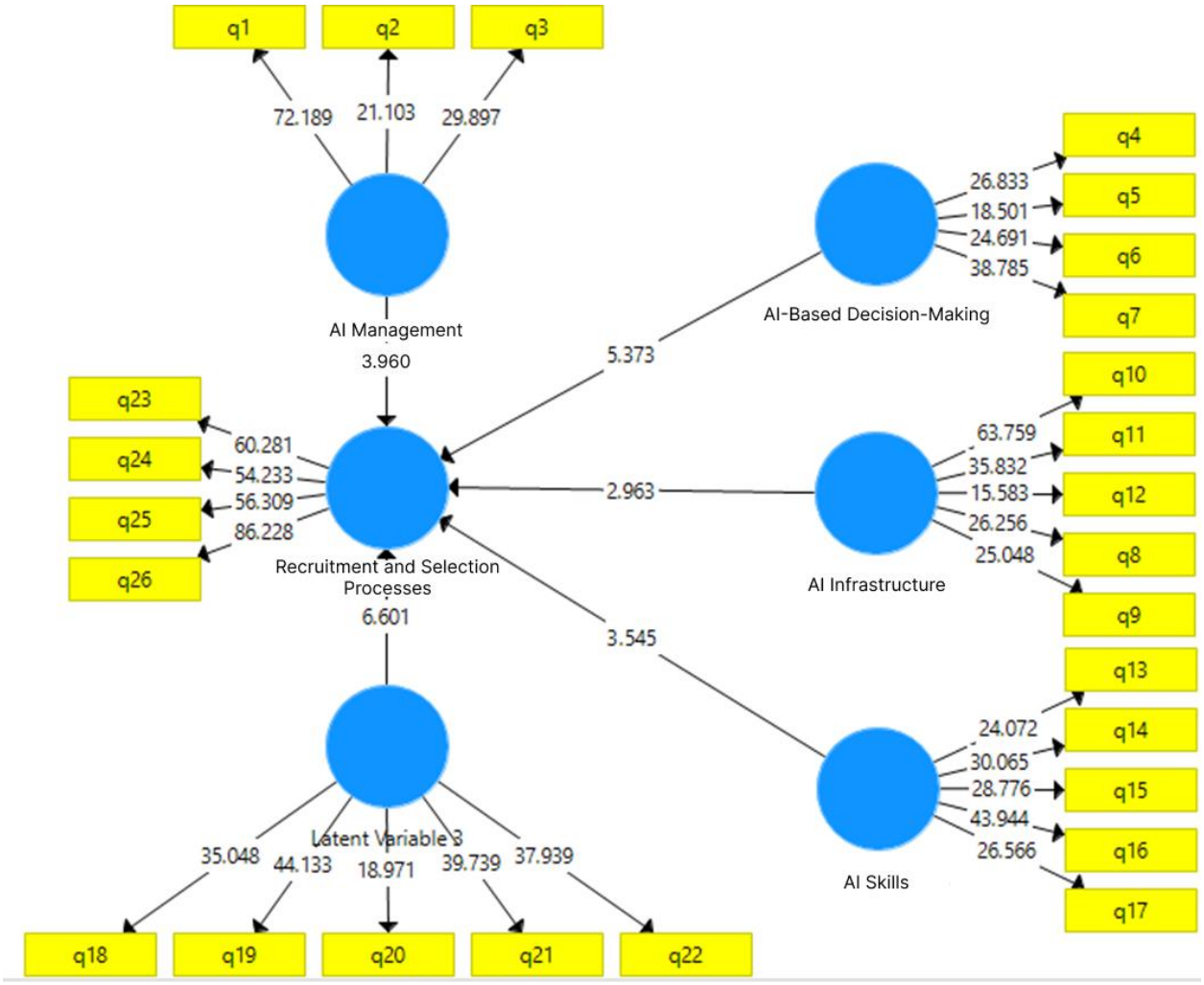


**Figure 2.** Model with T-Values

## 4. Discussion and Conclusion

This study explored the role of artificial intelligence (AI) in improving recruitment and selection processes in public sector organizations. The findings revealed a significant and positive impact of AI and all its components on improving recruitment and selection processes in public sector organizations in Tehran. These results clearly demonstrate that implementing AI in human resource processes can serve as an effective strategy to enhance efficiency, accuracy, and transparency in recruitment and selection processes.

AI management, as a critical component, enables organizations to effectively leverage AI technologies. The results indicate that having a clear strategy and optimal management in utilizing AI can significantly improve recruitment and selection processes. This allows organizations to maximize the use of AI tools and optimize their processes.

AI-based decision-making helps human resource managers make better decisions using precise data and advanced analytics. The findings show that employing AI algorithms in decision-making processes can reduce human biases and increase the accuracy of selections. This improvement in decision-making benefits not only the organizations but also enhances the experience for applicants.

The presence of necessary skills among employees is another influential factor in improving recruitment and selection processes. The findings highlight that training and empowering employees in AI-related fields can enhance productivity and efficiency in human resource processes. Organizations should note that investing in AI skill development can contribute to overall organizational performance.

The willingness to adopt AI in organizations also plays a crucial role in improving recruitment and selection processes. The study's findings suggest that organizations

with a culture that embraces innovation and new technologies can more effectively benefit from AI's advantages. This willingness to adopt AI can improve processes and increase employee job satisfaction.

In conclusion, this study emphasizes that AI, as an innovative tool, can lead to significant improvements in recruitment and selection processes in public sector organizations in Tehran. Given the substantial and meaningful impact of various AI components, it is recommended that public sector organizations seriously consider implementing and optimizing these technologies. This initiative not only enhances efficiency and accuracy in recruitment processes but also improves the quality of human resources and increases public satisfaction with government services. Consequently, attention to AI and its related components should be regarded as a strategic necessity in human resource management in public sector organizations.

To effectively implement AI in human resource processes, managers should develop a comprehensive strategy that includes clear objectives, necessary resources, and well-defined execution steps. Identifying specific organizational needs and selecting the appropriate AI tools is crucial to this process. Additionally, managers need to enhance the organization’s IT infrastructure by upgrading hardware, software, and communication networks to facilitate the effective use of AI tools. Creating an integrated information system can further streamline recruitment and selection processes.

Organizing training programs for employees to develop skills related to AI and associated technologies is equally important. These programs should focus on areas such as data analysis, AI algorithm application, and managing technological changes. Alongside skill development, fostering an organizational culture that embraces innovation and new technologies is critical. Encouraging idea generation, conducting workshops, and promoting collaboration among employees can help achieve this. Employees should also be reassured that adopting new technologies will benefit both them and the organization.

Using data analytics and AI tools to enhance recruitment and selection processes can provide significant advantages. These tools can identify successful hiring patterns, evaluate employee performance, and predict future organizational needs. Moreover, their use can reduce human biases in selection decisions, leading to more objective outcomes. Establishing regular feedback systems for employees and applicants is also essential to identify strengths and weaknesses in current processes. Such feedback can drive continuous improvement and increase satisfaction among all stakeholders involved in the recruitment process.

## Authors’ Contributions

Authors equally contributed to this article.

## Acknowledgments

Authors thank all participants who participate in this study.

## Declaration of Interest

The authors report no conflict of interest.

## Funding

According to the authors, this article has no financial support.

## Ethical Considerations

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

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