# SLBMJ

## Original Article

# Adoption and Role of Artificial Intelligence in Recruitment and Selection: Analytical Study in Pakistan

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### ABSTRACT

Artificial intelligence and digitalization are changing human resource management practices globally, including hiring, performance management, and employee development. The effectiveness, impartiality, and strategic potential of artificial intelligence-enabled human resource systems are highlighted in the literature, but little qualitative research examines how human resource professionals strike a balance between automation and human judgment, especially in developing nations like Pakistan. In order to investigate how digitalization and artificial intelligence are applied in human resource practices across two industries, the manufacturing sector and the IT sector, this study uses a qualitative, interpretive research methodology. Five human resource professionals participated in semi-structured interviews to gather data, which was then subjected to thematic analysis. Three main themes emerge from the findings: artificial intelligence-driven employee development and performance management, artificial intelligence-enhanced talent strategies from hiring to decision-making, and ethical issues. Three main themes emerge from the findings: AI-driven employee development and performance management, artificial intelligence-augmented talent strategies from recruitment to decision-making, and ethical issues and data security in digital human resources. The findings demonstrate that human oversight remains essential for ensuring justice, cultural fit, ethical integrity, and trust, despite the significant improvements in efficiency, transparency, and data-driven decision-making brought about by artificial intelligence and digital tools. By offering sector-specific, qualitative insights into how Pakistani organizations balance technological efficiency with human responsibility in human resource practices.

**Keywords:** Artificial intelligence, Human resource management, Recruitment, Regression analysis, Selection

**How to cite this article:** Fatima F. Adoption and Role of Artificial Intelligence in Recruitment and Selection: Analytical Study in Pakistan. Strategic Leadership and Business Management Journal 2025;1(2): 17-25.

## INTRODUCTION

In this increasingly digitized era, the application of technology is no longer considered an option but an urgent necessity to ensure organizational sustainability and competitiveness in the global market. (Eprianto et al., 2025). Digital transformation significantly influences human resource (HR) development by reshaping how organizations manage learning skills and workforce growth. AI is an umbrella term that encompasses areas such as machine learning and cognitive computing. AI is a branch of computer science that deals with the simulation of intelligent behavior in computers. AI has been successfully used in visual perception, natural language processing, speech recognition, speech-to-text conversion, language translation, tone analysis, and other areas (Guenole,2025). When it comes to AI in HRM, AI technologies offer promising solutions, from automating repetitive tests to enhancing HR processes with neutralized biases (Nawaz et al., 2024). Artificial intelligence (AI) assists recruiters in effectively and efficiently nominating applicants precisely and accurately. It helps in the screening of resumes without biasness However, many companies have started to use AI tools for recruitment; they have not explored all the algorithms that can be used to complete the whole recruitment and selection process (Gupta & Mishra, 2023). AI is such a powerful tool that organizations are increasingly using it in various areas, including HR management, especially in recruitment and selection functions. For instance, big data algorithms are highly instrumental in expanding the process of searching for candidates (Martín-Hernández, 2023).

AI has evolved significantly in recent years. There is, however, a lack of complete and comprehensive understanding of its use, impact, influence, and critical success factors in organizations (Martín-Hernández, 2023). AI does so precisely to improve and optimize such recruitment and hiring processes, and it helps organizations with the reduction of costs, especially in terms of time, effort, and in repeating daily tasks for recruiters, as well as for candidates in reducing the organizations' response time, favoring a positive employer brand (Martín-Hernández, 2023). The current HR aspect involves complex activities involving HR management (HRM) features, time management, and AI-based solutions that steadily improve HR process effectiveness. In general, AI refers to a computerized system (software or hardware) that possesses the ability to carry out tasks or thinking processes that we typically identify with human intelligence (Madanchian & Taherdoost, 2025). Self-learning chatbots capable of interacting in a way that can answer frequently asked questions from applicants and guide them in some directions, and Machine learning can help recruiters by identifying the keywords that the advertisement should contain and the right channels for its communication (Martín-Hernández, 2023).

AI brings greater accessibility to numerous forms of data (e.g., large volumes of résumés and social media content) that were previously burdensome and more difficult to analyze, due to its power to manage enormous quantities of data. (Martín-Hernández, 2023). In doing so, another advantage of AI is its potential to increase talent and diversity within the organisation, as well as to provide predictive accuracy (Martín-Hernández, 2023). Information technology's significance is being greatly elevated by the rapid changes in digitalization and AI. The current human resource (HR) aspect involves complex activities involving HR management (HRM) features, time management, and AI-based solutions that steadily improve HR process effectiveness (Madanchian & Taherdoost, 2025). Experts say that AI will help ensure the welfare of workers of higher age groups when they return to work in a post-pandemic job market, without age-related discrimination creeping in (Mukherjee & Krishnan, 2022). The implementation of machine learning applications can streamline organizational operations and improve the employee experience (Madanchian & Taherdoost, 2025). Because this technology can process data and make decisions at volumes and speeds far surpassing human capabilities, it enhances efficiency in identifying, attracting, screening, evaluating, interviewing, and managing job applicants (Rigotti & Fosch-Villaronga, 2024). The corporate sector is undergoing a large-scale infusion of artificial intelligence into its regular activities; hence, they use this resource extensively for recruitment (Mukherjee & Krishnan, 2022).

The Amazon resume selection algorithm is a well-known example, with its design relying on historical gender imbalances in the company's hiring practices, favoring men over women for technical roles (Rigotti & Fosch-Villaronga, 2024). Big data collection and data analytics, along with AI, can be beneficial in shortlisting candidates (Mukherjee & Krishnan, 2022). Given that AI applications often autonomously evaluate and exclude job applicants without human intervention (Rigotti & Fosch-Villaronga, 2024). Automation in Human

Resource Management (HRM) refers to the application of technology to replace or support administrative tasks that are usually done manually. In this context, automation includes the use of software for Personnel Administration, artificial intelligence (AI) based recruitment, automated performance evaluation, as well as digital payroll systems (Farawowan et al., 2025). It is the operation of utilizing digital potentials for strategic and operational HR management goals. Digital technologies are a group of tools (HRIS, electronic pointing, chatbots, gamification, etc.), services, and techniques used to optimize HR management and to facilitate company transformations (Nachit & Okar, 2020).

Artificial Intelligence in HRM has gained much interest in the recent past. The use of artificial intelligence in the management of HRM is viewed as a strategic shift that provides organizations with the potential to raise the efficiency of the processes, the accuracy of the decisions, and the quality of the decisions (Ghedabna et al., 2024). Artificial Intelligence (AI) is transforming Human Resource Management (HRM) worldwide, particularly in recruitment and selection. AI-driven tools automate candidate screening, scheduling, and data analysis, helping organizations make faster and more objective decisions. (Dima et al., 2024). Leading firms such as IBM and Unilever use AI algorithms to identify best-fit candidates, enhance candidate experience, and reduce hiring time (Faheem, 2025). Applications of machine learning (ML) and natural language processing (NLP) have improved resume analysis, chatbot interviews, and predictive analytics for talent forecasting (El-Menawy, 2022; Mitra, 2024).

One of the main challenges of the adoption of digital technology in HR is resistance to change, both from employees and managers. Many individuals worry about losing their role in the organization due to automation or lack confidence in dealing with new technologies. These feelings are often exacerbated by a lack of effective communication about the benefits of digital transformation and a lack of training to prepare for the change. (Eprianto et al., 2025). Existing literature primarily addresses technical and ethical aspects of AI adoption, but overlooks behavioral dimensions; how managers and employees perceive and adapt to AI-based hiring systems. (Almaraghi, 2024). Understanding these human responses is critical for sustainable and trust-based implementation. Digital transformation is being seen by HR Managers more as serving HR, and there is less emphasis on the role of HR in bringing about the digital transformation strategy (Fenech et al., 2019).

The purpose of this study is to explore how digitalization and automation, particularly the use of AI-based systems, are transforming HR practices in Pakistan. It aims to understand HR professionals' perceptions of digital recruitment, performance management, and employee development, while also examining the role of human judgment, ethical considerations, and data security in digitally enabled HR processes. By drawing on qualitative evidence from the IT and manufacturing sectors, the study highlights how organizations balance technological efficiency with human decision-making in HR.

**Objectives**
- To explore how digital tools and AI systems are used in recruitment and selection processes.
- To examine the role of human judgment and oversight in AI-supported HR decision-making.
- To analyze the use of digital systems in employee learning, development, and performance management.
- To identify ethical considerations, data security practices, and risks associated with digital HR.
- To compare digital HR practices between the IT sector and the manufacturing sector

When it comes to AI in HRM, AI technologies offer promising solutions, from automating repetitive tests to enhancing HR processes with neutral biases (Nawaz et al., 2024). AI is an umbrella term that encompasses areas such as machine learning and cognitive computing. AI is a branch of computer science that deals with the simulation of intelligent behavior in computers. AI has been successfully used in visual perception, natural language processing, speech recognition, speech-to-text conversion, language translation, tone analysis, and other areas (Guenole,2025). After almost sixty years of evolution, Artificial Intelligence has become ubiquitous over the past two decades. The AI applications and technologies prevailing today are not a worldwide recipe; instead, they act as a workshop with many tools for performing different functions (Nawaz et al., 2024).

Artificial intelligence and robotics are already present, influencing almost every single industry in one way or another. Organizational scientists use AI and machine learning to unleash the business potential languishing

in workforce data, something previously unusable because of its format (Gulliford & Parker Dixon, 2019). Since AI has penetrated almost all fields and gained a great deal of attention, researchers are now focusing on constructing strategic HRM practices backed up with AI technology (Nawaz et al., 2024). Every aspect of life and work is being transformed by AI, leading organizations understand the impact of AI on business models, workforce demographics, and the changing experiences expected by customers and employees. AI combined with strategic insight creates new business opportunities and is transforming the way HR contributes to an organization's competitive advantage (Guenole, 2025).

The role of AI in human resource management has been steadily increasing, transforming the way HR processes are carried out in all key areas of HRM. Due to the substantial volume of data related to organizational operations and workforce management, AI has been increasingly integrated into various operational HR procedures (Nawaz et al., 2024). AI and automation are becoming accessible for HR professionals (Guenole, 2025). The ubiquity of mobile and social technologies and personalization has redefined the bar for employee experience (Guenole, 2025). Electronic human resource management (E-HRM) is the use of web-based technologies to provide HRM practices within employing organizations. It embraces e-recruitment and e-learning, the first fields of HRM to make extensive use of web-based technology (Prakash & Mores, 2019). AI enables HR organizations to deliver new insights and services at large scale. The interaction of HRM digitalization and system is positively related to firm performance, and the relationship is strengthened by HR strategic and business involvement (Zhou et al., 2021). A new generation of e-learning technology can now be readily harnessed to maximize employee performance, while making the appropriate knowledge available to them, in the right amount, at the right time (Prakash & Mores, 2019).

## Role of Digitalization

Digitalization is changing organizations, and there is a need to understand and explore new skills and capabilities associated with digital transformation (Prakash & Mores, 2019). Information technology's significance is being greatly elevated by the rapid changes in digitalization and AI. The current HR aspect involves complex activities involving HRM features, time management, and AI-based solutions that steadily improve HR process effectiveness (Madanchian & Taherdoost, 2025). Machine learning technology can predict the future and detect problems more accurately than humans (Nawaz et al., 2024). With the disruption of business models across all industries, the talent acquisition game has changed. Industries are undergoing significant digital upheaval, with a prominent shift towards the integration of AI in decision-making processes to ensure the success and growth of companies (Nawaz et al., 2024).

## AI as a Strategic Enabler in Human Resource Management

AI has become a transformative force within HRM, redefining how organizations attract, evaluate, and retain talent. Globally, researchers view AI as a strategic enabler that enhances efficiency, objectivity, and decision-making across HR functions (Dima et al., 2024). AI-powered tools now support data-driven recruitment by automating resume screening, analyzing candidate profiles, and predicting job–person fit (Park et al., 2021). However, global research also highlights growing concerns about algorithmic bias, data privacy, and the opacity of automated decision-making (Azhar & Imran, 2025). When algorithms rely on historical or biased datasets, they can perpetuate discrimination in hiring or promotion decisions. Consequently, many organizations and policymakers are advocating for responsible and explainable AI frameworks to ensure fairness, transparency, and accountability in HR-related algorithms (Responsible AI in HRM, 2023).

Digitalization, machine learning, and AI are changing at a swift pace, significantly uplifting the role of information technology. The present HR aspect transpires AI-based resolution, is gradually more effective with HR processes, and involves complex tasks surrounded by the HRM functionalities (Panda et al., 2023). As Guenole (2025) stated, AI opens the door to previously unimaginable possibilities. While initial implementation strategies may have faced challenges from senior HR members, the multiple benefits are evident and measurable against corporate success and productivity levels today (Gulliford & Parker Dixon, 2019). Higher performance expectations and higher management support are both major predictors of AI adoption (Panda et al., 2023). To improve electronic productivity, cost effectiveness, and market competitiveness, HRM has devised ways to take advantage of technological innovations like computers and the internet (Madanchian & Taherdoost, 2025). Deploying AI in recruitment allows faster and more accurate hiring, and a better candidate and recruiter experience (Guenole,2025).

AI simplifies recruiting, but organizational and ethical problems often prevent its use. AI implementation improves the technical execution of HRM practices, including performance management and hiring (Madanchian & Taherdoost, 2025). Digital is now firmly embedded in every business. But even with technology as an integral part of the organization and its strategy, it is the employees who will underpin success in a world that continues to reinvent itself at an unprecedented rate (Prakash & Mores, 2019). Concerns about data security and privacy, as well as the possibility of job loss, may make employees wary of embracing AI technology (Madanchian & Taherdoost, 2025). In contrast, competitive pressure did not show a significant relationship with such an intention, and the 'employee champion' role harms AI adoption (Panda et al., 2023). Organizational awareness and preparedness are two of the key elements that impact AI adoption (Madanchian & Taherdoost, 2025).

The limits of human and technological agencies in facilitating mental well-being in businesses through technological breakthroughs were examined as well. AI is now widely used in HRM for cloud computing and big data analytics. The processing capacity and infrastructure required to manage large amounts of HR data are provided by these technologies (Madanchian & Taherdoost, 2025). This necessitates HR experts and scholars to delve into extant literature that elucidates AI-augmented HR capabilities and domains for development within the HR field (Nawaz et al., 2024)

## METHODOLOGY

This study adopts a qualitative research design to explore the impact of digitalization and automation in HR processes, with particular focus on AI-augmented talent strategies, employee development and performance management, and ethical considerations and data security. A qualitative approach was considered appropriate because the study aims to gain in depth understanding of HR professionals' experiences, perceptions, and interpretations regarding the use of digital and automated HR systems rather than to measure variables quantitatively. Qualitative research is especially suitable for examining complex social and organizational phenomena, such as human-AI collaboration, ethical concerns, and decision-making processes, which cannot be fully captured through numerical data. The study, therefore, relies on semi-structured interviews to generate rich, contextual insights grounded in real organizational practices.

The study follows an interpretive research approach, which assumes that reality is socially constructed and best understood through the meanings individuals assign to their experiences. In the context of this research, HR professionals' perspectives on AI, automation, and digital HR systems are shaped by their organizational roles, sectoral context, and daily interactions with technology. An interpretivist approach allows the researcher to explore how HR practitioners make sense of digital transformation, how they negotiate the balance between technology and human judgment, and how they address ethical and data security concerns in practice.

Primary data were collected through semi-structured interviews with HR professionals. Semi-structured interviews were chosen because they provide flexibility to explore predefined topics while also allowing participants to elaborate on their experiences and introduce new insights relevant to the research objectives.
The interviews were conducted in both English and Urdu, depending on the participant's comfort level. A bilingual approach was adopted to allow respondents to express their views more clearly and naturally, which enhanced the richness and authenticity of the data. Urdu responses were translated into English during the transcription process. Turboscribe was used for transcription, and additional manual corrections were made to ensure accuracy. Coding was done manually.

The study used purposive sampling, as participants were deliberately selected based on their direct involvement in HR processes and digital HR systems. This sampling method ensured that interviewees possessed relevant knowledge and experience related to AI, automation, and HR digitalization. Purposive sampling is appropriate in qualitative research where the objective is to gain information-rich insights rather than statistical generalization. Data were analyzed using thematic analysis, following the six-step framework proposed by Braun and Clarke (2006). Thematic analysis was selected because it allows systematic identification, analysis, and interpretation of patterns (themes) within qualitative data. This helped us understand how to move from codes to broader themes systematically.

The integration of AI and digital tools in HR practices has redefined how organizations manage talent, from recruitment and selection to final hiring decisions. This theme highlights how organizations implemented AI-powered systems to improve operational efficiency while maintaining fairness, human judgment, and cultural alignment. The theme emphasizes that automation does not replace human decision-making; rather, it supports HR professionals by streamlining repetitive tasks, improving candidate tracking, and providing structured data for informed decisions. The analysis revealed three interconnected categories: Digitalized recruitment & initial screening, Automated scheduling & candidate tracking, Human oversight, empathy & cultural fit, and behavioral interviews & final decisions. Each category demonstrates the interplay between technology and human judgment, showing how AI augments talent strategies in modern organizations.

## Category 1: Digitalized Recruitment and Initial Screening
AI screening tools and CV parsing have become central to improving efficiency in candidate evaluation. AI has been integrated to assist in sourcing and initial screening, which saves us a huge amount of time. The focus now is more on quality interactions rather than administrative tasks." Similarly, (HR Operations & Onboarding Executive) highlighted the critical role of human oversight: "Automated screening can create bias if used without human checks. However, here AI is only used as a support tool. Final decisions always involve human review." At a manufacturing company, they implement a combination of tools for structured recruitment. Sr. Manager HR explained: "We use a combination of digital tools, including job portals, LinkedIn, ATS features, and internal screening spreadsheets… This allows the recruitment process to remain organized and traceable."

It also relies on SAP and job portals to manage recruitment efficiently: "Screening and documentation are more organized, with minimal manual handling. We always keep a manual review stage to check profiles that may not fully match the automated filter but have strong potential." Both organizations utilize AI to streamline the early stages of recruitment. While the IT Company prioritizes reducing administrative workload and improving quality interactions, the Manufacturing Company emphasizes structured evaluation, transparency, and traceable workflows. Despite technological support, human intervention remains essential to ensure fairness, minimize bias, and identify high-potential candidates that automated systems may overlook.

## Category 2: Automated Scheduling and Candidate Tracking
Automation enhances operational efficiency by simplifying interview coordination, follow-ups, and candidate communication. IT Company's Talent Acquisition executive highlighted: "Workable is really helpful in keeping everything organized and transparent, including interview scheduling." The HR Executive added, "Automated emails keep candidates informed about their application status, offer letters, and joining instructions. This clarity reduces confusion and improves their overall perception of the organization."

Manufacturing company Sr. HR also noted benefits from automated systems. "Digital systems help in… scheduling interviews automatically and maintaining data for future hiring needs." It uses SAP and integrated email workflows: "Interview scheduling is handled through digital calendars and email automation, which reduces delays and improves candidate experience." Automated scheduling and communication improve candidate experience, reduce delays, and create transparency in recruitment processes. An IT company leverages these tools to enhance operational coordination during onboarding, while the Manufacturing Company focuses on creating a traceable, well-documented process. Both approaches illustrate how automation can free HR professionals from administrative tasks, allowing them to focus on strategic talent engagement.

## Category 3: Human Oversight, Empathy, and Cultural Fit
Despite technological advancements, assessing cultural fit, soft skills, and interpersonal qualities remains a human-centric activity. The IT Company's HR executive explained: "Cultural fit is assessed during interviews and onboarding interactions. We observe communication style, adaptability, and attitude during HR discussions. Software helps with administration, but human interaction determines cultural alignment." Senior Manager HR at a manufacturing company emphasizes structured human evaluation: "We ensure fairness by reviewing borderline cases manually, focusing on competency-based interviews, standardizing evaluation criteria, and ensuring multiple interviewers are involved." HR Executive at a manufacturing company also reinforced the importance of human judgment: "We evaluate candidates holistically, looking at skills,

experience, and attitude. Automated tools assist, but final assessment always requires human judgment." Human oversight ensures that AI does not replace the nuanced evaluation of personality, behavior, and cultural alignment. The IT company emphasizes practical interaction and onboarding-based assessment, while the Manufacturing company relies on structured evaluation frameworks with multiple interviewers. Both approaches illustrate that AI is an enabler rather than a decision-maker.

## DISCUSSION

The results of this study are generally consistent with previous research that views AI as a strategic enabler in HRM, improving decision-making, efficiency, and accuracy across HR functions (Dima et al., 2024). AI-supported systems facilitate data-driven performance management, automate administrative tasks, and streamline hiring, according to earlier research (Nawaz et al., 2024; Panda et al., 2023). These claims are supported by empirical data from the company, especially when it comes to the use of digital dashboards, AI-assisted screening, automated scheduling, applicant tracking systems (ATS), and SAP-based HR systems.

By emphasizing how HR professionals actively negotiate the boundaries between automation and human judgment, an area understudied in previous research, particularly within the Pakistani context, the study also expands the body of literature. The results highlight lived HR experiences, in line with Almaraghi's (2024) call for more attention to the behavioral and human aspects of AI adoption, even though global studies frequently concentrate on technological capability and system efficiency. According to the literature, AI increases early-stage screening objectivity, speeds up recruitment, and lessens administrative burden (Panda et al., 2023; Park et al., 2021). The results of this study corroborate these assertions because both the IT company and manufacturing company use digitalized recruitment tools to handle candidate tracking, interview scheduling, and CV screening. While Manufacturing Company uses SAP, job portals, and structured ATS workflows to ensure traceability and consistency, IT Company uses platforms like Workable and Talent.io to facilitate quick shortlisting and centralized coordination.

The results, however, add nuance to the literature by showing that people do not view AI as a substitute for human judgment. Rather, HR specialists in both companies prioritized behavioral interviews, manual review, and cultural fit evaluations, corroborating earlier research on algorithmic bias and the shortcomings of automated decision-making (Azhar & Imran, 2025). In line with responsible AI frameworks promoted in recent scholarship, this supports the claim that AI works best as a decision-support system rather than a decision-maker. Previous research emphasizes how AI and digital platforms facilitate performance analytics, real-time feedback, and ongoing learning (Park et al., 2021). These assertions are supported by the study's findings, which demonstrate that both organizations make use of digital dashboards, KPI tracking, e-learning modules, and structured appraisal systems. While Orient Group takes a more structured, company-wide approach to training analytics and appraisals using SAP and digital scorecards, IT Company prioritizes onboarding-focused learning and performance transparency through dashboards.

Notably, by showing how HR professionals actively interpret and contextualize performance data, the findings add to the body of literature. Even though AI offers metrics and analytics, managerial judgment is still required for final assessments, especially when evaluating qualitative aspects like attitude, teamwork, and flexibility. This study (Farawowan et al., 2025) claims that even in HR environments with a wealth of data, human interpretation is still crucial. The study concludes that IT Company exhibits greater operational agility and deeper integration of AI-driven recruitment tools, while Manufacturing Company displays more formalized, policy-driven HR digitalization through SAP and structured evaluation frameworks, which is consistent with earlier research suggesting sectoral differences in digital maturity (Fenech et al., 2019). Despite these distinctions, both companies agree on one thing: technology only improves HR efficacy when combined with human judgment, ethical consciousness, and contextual awareness.

## DECLARATIONS

**Consent to participate:** Written consent had been obtained from participants. All methods were performed following the relevant guidelines and regulations.

**Availability of Data and Materials:** Data will be made available upon request. The corresponding author will submit all dataset files.
**Competing interests:** None
**Funding:** No funding source involved

## AUTHORS' CONTRIBUTIONS

**FF:** Concept and design of study, critical intellectual input.
**FF:** Acquisition and analysis of data, drafting of the manuscript, and critical intellectual input.
**FF:** Acquisition of data, drafting of the manuscript.
The author had read and approved the final manuscript.

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