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Artificial Intelligence in Human Resource Management: A Case of Information Technology Sector of Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) is revolutionizing traditional HR practices by enhancing efficiency, objectivity, and strategic decision-making. This paper explores the multifaceted applications of AI in HRM, focusing on recruitment, performance evaluation, employee engagement, and workforce planning. Through a comprehensive literature review and analysis of current industry practices, the study highlights how AI-driven tools such as chatbots, predictive analytics, and resume screening algorithms are transforming HR functions. While AI offers significant benefits, including time savings and improved candidate-job matching, it also raises critical concerns about data privacy, algorithmic bias, and ethical transparency. The paper concludes with recommendations for responsible AI adoption and outlines areas for future research, emphasizing the need for a balanced approach that leverages AI while preserving the human element in HRM.

Keywords: Artificial Intelligence, Human Resource Management, AI in Recruitment, Predictive Analytics, HR Technology, Employee Engagement

INTRODUCTION

The 21st century has witnessed the rapid advancement of technologies that have profoundly transformed business operations and organizational strategies across various industries. One of the most disruptive and promising innovations is Artificial Intelligence (AI), which has evolved from a theoretical concept into a practical tool that impacts daily operations in sectors as diverse as healthcare, education, finance, and manufacturing. Among these, the field of Human Resource Management (HRM) has experienced significant shifts due to the incorporation of AI technologies. Traditionally focused on personnel administration, recruitment, and employee relations, HRM has progressively adopted a strategic role within organizations. As firms seek to improve competitiveness, efficiency, and employee satisfaction, the integration of AI in HRM has become not only beneficial but essential.

The historical role of HRM has been largely administrative, encompassing activities such as record-keeping, payroll management, and compliance monitoring. However, in response to globalization, workforce diversity, and the emergence of the knowledge economy, HRM has evolved into a strategic partner in achieving organizational goals (Iqbal, Shah & Abid, 2025; Ivascu, et al., 2022; Ghulam, et al., 2019). In parallel, AI technologies, particularly machine learning, natural language processing, robotic process automation, and predictive analytics, have matured and demonstrated their ability to automate complex tasks, extract insights from big data, and facilitate better decision-making (Khoso, et al., 2024; Sultana & Imran, 2024; Ahmad, Bibi & Imran, 2023). The convergence of AI and HRM represents a paradigm shift, enabling organizations to transition from reactive to proactive management of human capital.

This transformation is particularly evident in recruitment and talent acquisition processes, where AI-powered tools are being utilized to analyze resumes, assess candidate suitability, and conduct preliminary interviews through chatbots. Similarly, AI is revolutionizing performance management by enabling real-time feedback, objective performance assessments, and personalized development plans. In employee engagement and retention, AI algorithms are being used to identify patterns in employee behavior and predict turnover risks. These applications demonstrate the multifaceted ways in which AI is reshaping the HR landscape.

AI's impact is not limited to operational efficiency but extends to strategic HR functions as well. Workforce planning, diversity and inclusion strategies, and organizational culture development are increasingly being influenced by AI-driven insights. For instance, companies are leveraging AI to conduct sentiment analysis from employee surveys and internal communication platforms, which helps in identifying pain points and enhancing employee satisfaction. Furthermore, AI is playing a critical role in the automation of repetitive HR tasks such as scheduling interviews, managing leave applications, and handling employee queries, thereby freeing up HR professionals to focus on more strategic and value-adding activities (Khan & Haq, 2025; Haq & Khan, 2024).

Globally, organizations are reporting significant benefits from AI integration in

HRM. A study by IBM found that companies using AI in HR processes reported a 20% increase in productivity and a 30% improvement in employee engagement. Similarly, Deloitte's Global Human Capital Trends survey emphasized the growing reliance on AI for decision-making in HR (Azhar, 2024; Azhar & Imran, 2024; Azhar, et al., 2022). Despite these positive trends, the degree of AI adoption varies significantly across regions, industries, and organizational sizes (Khan, Haq, & Naseer, 2022; Shaukat, Rehman, & ul Haq, 2021). While large multinational corporations often lead the way in implementing sophisticated AI solutions, small and medium-sized enterprises (SMEs) face resource constraints and technical limitations that hinder widespread adoption.

Problem Statement

Despite the promising advancements, the integration of AI in HRM presents several challenges and raises important questions. A primary concern is the potential loss of the human touch in managing people—a function historically rooted in empathy, intuition, and interpersonal relationships. While AI can enhance efficiency and objectivity, there is apprehension that overreliance on technology may lead to depersonalization and reduce employee trust (Danish, Akhtar & Imran, 2025; Mankash, et al., 2025; Hafeez, Yaseen & Imran, 2019). Moreover, algorithmic bias remains a critical issue, as AI systems trained on biased data can perpetuate or even exacerbate discrimination in hiring and evaluation processes.

Another significant challenge is the lack of readiness among HR professionals to fully leverage AI technologies (Shaukat, et al., 2020; ul Haq & ur Rehman, 2017). Many organizations face a skills gap, where HR personnel lack the technical expertise to implement and manage AI tools effectively. Furthermore, the ethical and legal implications of AI in HRM, such as data privacy, transparency, and accountability, are areas of ongoing debate and regulatory concern (Muhammad, et al., 2020). These challenges underscore the need for a balanced and informed approach to AI adoption in HRM, one that maximizes benefits while mitigating risks (Parveen, et al., 2020; ul haq, 2019; Ali & Haq 2017).

The dynamic nature of AI technologies also introduces the challenge of keeping up with rapid innovation. HR departments may struggle to identify the most relevant and effective AI solutions from a growing marketplace of vendors and tools. Integration with existing HR Information Systems (HRIS), ensuring interoperability, and maintaining data integrity are additional technical hurdles that can complicate implementation. Moreover, the lack of standardized metrics to evaluate AI performance in HR contexts makes it difficult to assess return on investment (ROI) and long-term impact (Kayani, et al., 2023; Khan, et al., 2021; Khan & Khan, 2020).

Resistance to change is another factor that cannot be overlooked. Employees and HR professionals alike may be skeptical or fearful of AI-driven transformations, particularly when they involve automation of tasks that were traditionally seen as core human responsibilities (Sohail-Rehan, & Ul-Haq, 2018; Haq, 2017; ul Haq, 2012). Concerns about job displacement, surveillance, and loss of autonomy can foster resistance, thereby impeding successful implementation. These human factors

must be carefully managed through effective change management strategies, inclusive communication, and continuous training programs.

Research Objectives

This study aims to explore the integration of Artificial Intelligence (AI) in Human Resource Management (HRM), focusing on both its opportunities and challenges. It seeks to investigate how AI is currently being applied across various HR functions such as recruitment, performance management, learning and development, and employee engagement. The research also aims to assess the impact of AI on organizational efficiency, the quality of decision-making, and the overall employee experience. Furthermore, it identifies the key challenges and limitations that organizations face when adopting AI in HRM. Based on these insights, the study intends to propose strategic recommendations for the effective and ethical implementation of AI in HR practices. It also evaluates the organizational readiness and cultural factors that influence AI acceptance within HR departments. Lastly, the study aims to develop a comprehensive framework to measure the success of AI initiatives in HRM, incorporating metrics related to productivity, employee engagement, and inclusivity.

Research Questions

To guide the study, here are the key questions:

1. Where and how is AI being used in HR?
2. What benefits are organizations seeing?
3. What are the risks and ethical concerns?
4. How can companies balance AI use with human judgment?
5. What makes AI adoption successful across different workplaces?
6. How do employees feel about AI in HR, and how does it affect culture?

Significance of the Study

This research adds value both academically and practically. Academically, it fills gaps by looking at AI across multiple HR functions and from different perspectives. Practically, it offers real-world insights for HR teams, tech developers, and policymakers.

As HR becomes more data-driven, professionals need new skills in analytics, tech, and ethics. This paper highlights that need and encourage training and support.

Software developers and AI vendors can also learn from this study—understanding what HR teams need and the context they work in helps build better tools. Lastly, regulators can use these findings to create fair and transparent rules for AI in HR.

LITERATURE REVIEW

AI has significantly transformed various functions of Human Resource Management (HRM), particularly in recruitment and talent acquisition. Companies now use algorithms trained on historical data to screen resumes, predict candidate success, and eliminate unsuitable profiles. Tools like HireVue and Pymetrics automate screening and assessments, using machine learning to evaluate facial

expressions, tone, and language in video interviews. Studies show a 40–60% reduction in time-to-hire and better job-candidate matches. However, concerns about algorithmic bias, especially against minorities, and the lack of transparency in AI decision-making persist. Many candidates also express discomfort with AI-only assessments, emphasizing the need for human involvement alongside AI tools.

In performance management, AI enables real-time feedback and data-driven evaluations, replacing inefficient and subjective annual reviews. Tools like Betterworks and CultureAmp track KPIs, analyze communications, and offer development insights (Naseer, et al., 2024; Shah et al., 2023; Aurangzeb, & Haq, 2012). These systems often increase satisfaction by promoting fairness and transparency, though issues like employee surveillance and privacy remain concerns, particularly under regulations like the GDPR.

Learning and development have been enhanced through AI-powered adaptive platforms like Docebo and Coursera for Business. These systems personalize content, track progress, and boost engagement using gamification and microlearning (Hsu & Huynh, 2023; Hsu et al., 2022; Hsu, Huang, & Huynh, 2021). Studies report improved knowledge retention and course completion rates. However, the relevance and fairness of recommended content require oversight, and digital literacy gaps can hinder adoption.

For employee engagement and retention, AI analyzes sentiment, predicts attrition, and tailors engagement strategies using survey data and communication patterns. Companies such as IBM have used such tools with high accuracy in turnover prediction. Despite their effectiveness, the fine line between proactive support and intrusive surveillance raises ethical concerns, highlighting the importance of explainable AI and informed consent.

Across all areas, ethical and legal challenges are central. AI can perpetuate bias, lacks transparency, and complicates accountability (Ali, et al., 2020; Ahmad, 2018). Scholars and policymakers emphasize the need for fairness, auditability, and clear governance. Regulatory efforts, such as the EU AI Act, are underway to ensure responsible use of AI in HR (Hsu et al., 2024; Hsu & Huynh, 2023; Hsu et al., 2023).

Finally, successful AI adoption depends on organizational readiness, including strategic alignment, digital infrastructure, and HR's tech fluency. While companies with strong digital maturity benefit more from AI, many HR teams still lack the skills and understanding needed for meaningful implementation, leading to limited or ineffective use.

Underpinning Theories

To understand how AI is integrated into Human Resource Management (HRM), several foundational and emerging theories offer valuable insights. These frameworks help explain the motivations for AI adoption, its impact on HR outcomes, and the factors that influence these dynamics.

The Technology Acceptance Model (TAM), developed by Davis (1989), emphasizes that perceived usefulness and ease of use determine whether users accept new technologies. In HR, AI is more likely to be adopted if it is seen as improving

performance and being user-friendly. The Unified Theory of Acceptance and Use of Technology (UTAUT) extends this by including factors like social influence, available resources, and performance expectations, all of which shape how HR professionals engage with AI tools.

The Resource-Based View (RBV) suggests that AI capabilities—such as predictive analytics or personalized learning—can serve as strategic resources that offer a competitive edge if they are valuable, rare, inimitable, and non-substitutable. Effective AI use reflects a dynamic capability that can sustain organizational performance.

Socio-Technical Systems Theory (STS) stresses the importance of aligning technology with people and processes. Successful AI implementation in HR requires harmonizing technical tools with employee skills and workflows to avoid inefficiencies or ethical concerns. Similarly, Institutional Theory highlights how external pressures like regulations, industry norms, and peer practices often drive AI adoption in HR, even beyond efficiency motivations (Shah, Qazi & Khan, 2025; Naseer, Rehan & Shah, 2024; Malik, Hanif & Elahi, 2025).

Diffusion of Innovation (DOI) theory explains how AI technologies spread within organizations, influenced by factors such as relative advantage, ease of use, and visibility. Early adopters play a vital role in demonstrating the value of AI to others.

Lastly, Ethical Decision-Making Theory underscores that the ethical use of AI particularly in high-stakes HR activities like hiring or evaluation—depends on moral intensity, ethical culture, and individual judgment. This theory calls for a conscious approach to AI use, considering both its benefits and potential consequences.

Hypotheses

H1 states that the adoption of AI in recruitment positively influences hiring efficiency and candidate quality

H2 suggests that AI-driven performance management systems enhance objectivity and employee satisfaction compared to traditional methods

H3 proposes that AI-powered learning and development systems improve employee learning outcomes and engagement

H4 asserts that AI-based predictive analytics in employee engagement are significantly associated with lower turnover rates

H5 argues that the presence of ethical AI governance moderates the relationship between AI adoption and employee trust

H6 highlights that organizational readiness—including infrastructure, skills, and culture—moderates the relationship between AI integration and HRM effectiveness

H7 posits that perceived usefulness and ease of use mediate the relationship between AI system quality and HR professional adoption

H8 claims that perceived algorithmic bias negatively impacts employee acceptance of AI-based decisions

H9 maintains that social influence and facilitating conditions are positively

associated with the behavioral intention to adopt AI in HRM

Conceptual Model

Research Gap

Despite extensive research into individual AI applications in Human Resource Management (HRM), several gaps remain that this study seeks to address. First, while many studies examine specific HR functions such as recruitment, there is a lack of integrated frameworks that consider the broader, holistic impact of AI across multiple HR domains. Additionally, the role of mediators and moderators—such as ethical governance, organizational readiness, and individual perceptions drawn from models like TAM and UTAUT—has not been adequately explored in empirical literature. Geographical bias is another limitation, with most existing research concentrated in the U.S. and Europe, leaving developing regions in Asia, Africa, and Latin America underrepresented. Ethical concerns, including issues of transparency, accountability, and algorithmic bias, are frequently acknowledged but rarely operationalized or measured in practical terms. Furthermore, longitudinal research examining the long-term effects of AI adoption on HR performance, employee well-being, and organizational culture is scarce. Lastly, current studies often overlook the cognitive and emotional factors that shape employee acceptance of AI technologies. This study addresses these gaps by proposing and empirically testing a comprehensive model that integrates diverse HRM functions while accounting for ethical, organizational, and behavioral dimensions. In doing so, it contributes both theoretical insight and practical guidance for organizations aiming to implement AI in a responsible and effective manner.

METHODOLOGY

Research Design

The research design provides the framework for conducting this study on the integration of Artificial Intelligence (AI) in Human Resource Management (HRM). Given AI's broad impact on recruitment, performance management, training, and employee engagement, a comprehensive design is required. A mixed-methods approach has been adopted to combine the strengths of both quantitative and qualitative research, allowing for a thorough understanding of the topic.

Justification for Mixed-Methods Approach

This methodology is particularly appropriate for exploring complex and multifaceted issues like AI adoption in HRM. Quantitative data offers statistical generalization and identifies trends, while qualitative data captures personal insights and contextual nuances. The combination allows for deeper exploration of both measurable impacts and human perceptions. It addresses the gap in existing literature that often treats the subject through a single-dimensional lens, thereby enabling a richer analysis of AI's role in HR practices.

Quantitative Research Design

The quantitative component involves the collection of numerical data through a structured survey. This survey will examine the prevalence and effectiveness of AI

tools in HRM and explore perceptions, barriers, and ethical concerns. The questionnaire is organized into sections covering demographics, AI perceptions, usage, challenges, and ethical considerations, using a Likert scale for response measurement.

Data will be collected through online and limited in-person distribution, targeting 250 participants from Khyber Pakhtunkhwa, including HR managers, IT professionals, and executives. Stratified random sampling ensures representative subgroup participation. Data analysis will be conducted using SPSS, applying descriptive statistics, correlation, regression, and ANOVA to derive statistically significant insights.

Qualitative Research Design

To complement the statistical data, qualitative data will be gathered through semi-structured interviews with 20 selected participants. These interviews will focus on organizational experiences, employee reactions, challenges, and ethical implications of AI integration in HRM. The data will be transcribed and analyzed using thematic analysis with the aid of NVivo software, involving coding, theme identification, and interpretation to uncover key patterns and insights.

Integration of Quantitative and Qualitative Data

Following separate analyses, both data sets will be integrated to provide a holistic understanding. For instance, quantitative findings regarding AI's effectiveness in recruitment will be enriched with qualitative accounts of HR professionals' experiences. Similarly, statistical identification of barriers will be contextualized through interview-based narratives, ensuring the research captures both empirical trends and lived experiences.

Sampling and Population

This study targets professionals in the Information Technology (IT) sector of Khyber Pakhtunkhwa, Pakistan, a region where rapid technological development has led to the growing integration of Artificial Intelligence (AI) in Human Resource Management (HRM). The selected population reflects the relevance and applicability of AI-based HR practices, such as recruitment, performance evaluation, training, and employee engagement, in a digitally evolving environment.

Target Population

The population comprises individuals working in IT firms across the province who are involved in or affected by the application of AI in HR functions. This includes HR managers responsible for implementing and overseeing AI-driven processes, IT professionals who support the technical deployment and maintenance of AI tools, and senior executives such as CIOs and CEOs who guide strategic decisions related to AI integration. These subgroups were selected to ensure that the study captures diverse perspectives across functional and strategic domains.

Sample Size

A total sample of 250 respondents was determined to ensure statistical robustness and representativeness. The sample includes 100 HR managers, 100 IT professionals, and 50 senior executives. This proportional distribution reflects the

varying degrees of involvement each subgroup has in the adoption and use of AI technologies within HRM, with greater emphasis on those more directly engaged in the implementation process.

Sampling Technique

Stratified random sampling was employed to enhance the generalizability and accuracy of findings. The process involved dividing the population into three strata—HR managers, IT professionals, and senior executives—and randomly selecting participants from each category in proportion to their estimated presence in the target population. This method ensures that each group is adequately represented, thereby allowing for balanced insights and reducing the risk of sampling bias. Response tracking was conducted throughout to maintain alignment with the predefined distribution ratios.

Data Collection Methods

This study adopts a mixed-methods approach, combining surveys and interviews to gather both quantitative and qualitative data.

Survey Method

A structured online survey will be the main tool for collecting quantitative data. It will include demographic questions, Likert-scale items on AI's role in HRM, and questions about AI tools, adoption barriers, and ethical concerns. The survey will be pilot-tested with 10 participants and analyzed using SPSS for descriptive and inferential statistics.

Interview Method

Semi-structured interviews with 20 selected participants will provide deeper qualitative insights. These interviews will explore AI adoption processes, impacts, challenges, and ethical issues. Data will be coded and analyzed thematically using NVivo.

Data Analysis Techniques

This study will apply both quantitative and qualitative data analysis to interpret findings effectively and address the research questions.

Quantitative Data Analysis

Survey responses will be analyzed using SPSS. First, descriptive statistics (frequencies, mean, median, standard deviation) will summarize participants' views on AI in HRM. Then, correlation analysis (Pearson or Spearman) will explore relationships between variables like AI usage and recruitment efficiency. Regression analysis will assess the impact of independent variables (e.g., AI adoption) on outcomes (e.g., hiring speed, employee satisfaction). ANOVA will be used to compare differences among respondent groups (e.g., HR managers vs. IT professionals).

To ensure the data's reliability and validity, Cronbach's Alpha will measure internal consistency, and factor analysis will identify common themes among related questions.

Qualitative Data Analysis

Interview data will be processed using thematic analysis, allowing the extraction

of key patterns. This includes familiarization with transcripts, generating initial codes, grouping codes into broader themes (e.g., "Ethical Concerns" or "Implementation Challenges"), and refining them. Once finalized, themes will be clearly defined and used to interpret qualitative findings.

NVivo software will assist with coding and organizing the data to support systematic analysis and insight development.

Ethical Considerations

Ethical conduct is essential in research involving human participants. This study will uphold strict ethical standards to ensure participant respect, privacy, and responsible data handling.

Informed Consent

Participants will receive an information sheet detailing the study's purpose, voluntary nature, data handling, potential risks, and their right to withdraw at any time. Informed consent will be obtained via signed forms.

Confidentiality and Anonymity

Data will be anonymized using unique participant codes. No identifying information will appear in reports. Data will be securely stored and accessed only by the research team.

Ethical Approval

Approval will be sought from the relevant Institutional Review Board (IRB), which will review consent forms and methods to ensure compliance with ethical guidelines.

Transparency and Integrity

The research will remain transparent, with participants offered access to findings. Ethical standards regarding conflicts of interest and data integrity will be strictly followed.

Limitations and Challenges

This study acknowledges several limitations that may affect its findings:

Sample Size and Generalizability

Although 250 respondents provide statistical value, focusing on the IT sector in Khyber Pakhtunkhwa limits the generalizability to other regions or industries.

Self-Report Bias

Participants may give socially desirable responses. Anonymity will be maintained to encourage honesty.

Interview Scope

Only 20 interviewees may not capture the full range of perspectives, limiting qualitative depth.

Technological Constraints

Online data collection may exclude individuals lacking digital access or skills.

Justification of Methodology Choices

The methodology was chosen to align with the research objectives and the complex nature of AI in HRM. A mixed-methods approach, stratified random sampling, and the use of surveys and interviews were selected to ensure

comprehensive and balanced data collection.

Mixed-Methods Approach

Given the multifaceted impact of AI in HRM, combining quantitative and qualitative methods offers both measurable insights and deeper contextual understanding. Quantitative data will reveal patterns in AI adoption, while qualitative data will provide in-depth perspectives on participants' experiences. This dual approach enhances validity by allowing triangulation, strengthening the credibility of the findings.

Stratified Random Sampling

Stratified sampling ensures proportional representation of HR managers, IT professionals, and decision-makers, improving the accuracy and generalizability of results. This method minimizes bias and ensures that all relevant stakeholder views are included in the analysis.

Survey and Interview Data Collection

Surveys are used for efficient data collection from a large sample, enabling statistical analysis of trends and opinions. Interviews complement this by providing detailed insights into individual experiences, ethical concerns, and challenges related to AI implementation, offering a richer understanding of the research topic.

Theoretical Framework Integration

This study draws upon several foundational theories from the fields of Artificial Intelligence and Human Resource Management to understand the impact of AI technologies on HR practices. These frameworks provide a theoretical base for interpreting the findings and guiding the research.

The Technology Acceptance Model (TAM), introduced by Davis (1989), is a widely recognized framework for understanding how users accept and use new technologies. According to TAM, two main factors influence technology adoption: perceived ease of use and perceived usefulness. In the context of AI in HRM, this model helps explain how HR and IT professionals evaluate AI tools and decide whether to integrate them into their practices. Perceived usefulness relates to how much AI is believed to enhance HR operations, such as recruitment or performance appraisal. Perceived ease of use reflects the extent to which HR professionals find AI tools simple to implement and navigate. This model is central to exploring user perceptions and how this shape AI adoption.

The Diffusion of Innovation (DOI) Theory, developed by Rogers (1962), explains how new technologies spread within a social system. It categorizes adopters as innovators, early adopters, early majority, late majority, and laggards. Applied to AI in HRM, this theory assists in understanding where HR departments in IT companies of Khyber Pakhtunkhwa stand in their AI adoption journey—whether they are in initial exploratory phases or have already integrated AI into their operations. The study examines both adopter categories and the characteristics of AI tools—such as their relative advantage and compatibility—to understand how these factors influence diffusion and adoption rates.

Additionally, several Human Resource Management theories serve as the

foundation for analyzing the transformation of HR practices through AI. Human Capital Theory emphasizes the importance of knowledge, skills, and competencies in organizational success. Here, AI supports human capital by automating repetitive tasks, enabling HR professionals to focus on strategic areas like talent management. Behavioral Decision Theory considers how cognitive, emotional, and psychological factors influence decisions. AI's ability to deliver data-driven insights can support objective decision-making, though it also introduces ethical questions around algorithmic choices. The Resource-Based View (RBV) frames AI as a strategic internal resource that organizations can leverage for competitive advantage, particularly by enhancing HR efficiency and performance.

By integrating these HRM theories with adoption models like TAM and DOI, this study explores how AI tools are redefining HR roles and shaping how professionals interact with and utilize emerging technologies in the workplace.

Implications of the Methodology

The use of a mixed-methods approach in this research carries important implications for both academic and practical domains, offering a comprehensive view of AI's role in HRM.

From an academic perspective, the study contributes to the existing literature by providing an in-depth analysis of AI's integration into HRM, combining empirical data with qualitative insights. It deepens theoretical understanding by applying and potentially extending models like TAM and DOI within the HRM context, identifying where these models align with real-world adoption and where they may fall short. Methodologically, it serves as a case for the value of mixed-methods research in studying complex technological phenomena, showcasing how quantitative trends and qualitative experiences together create a more nuanced understanding.

In terms of practical implications, the research offers guidance for HR professionals and organizational leaders. It highlights the tangible benefits of AI tools while addressing the challenges and ethical concerns associated with their use. These insights can inform better decision-making around AI adoption, helping HR managers strategically implement AI in ways that enhance functionality and align with organizational goals. For organizations already using or planning to use AI in HRM, the findings can help assess current practices and identify areas for improvement, particularly in managing change and ensuring ethical implementation.

Finally, there are policy implications. As AI becomes more prevalent in HR functions, concerns around transparency, fairness, and accountability grow. This research can inform policymakers in developing regulations and ethical standards that safeguard employee rights and ensure responsible AI use in organizational settings.

RESULTS

Data was gathered from 250 survey respondents and 20 interview participants to

assess the current landscape of AI integration in HRM. The results focus on four core areas: perceptions of AI in HRM, the usage of AI tools, challenges encountered during adoption, and ethical concerns associated with AI deployment.

The survey sample consisted of HR managers, IT professionals, and senior executives/decision-makers. HR managers and IT professionals each represented 40% of the sample, while senior executives accounted for 20%. A significant majority of respondents (70%) had over five years of experience, indicating a well-informed and experienced group.

Regarding perceptions of AI in HRM, participants evaluated the benefits and effectiveness of AI across various HR functions. In recruitment, 72% of HR managers and 60% of IT professionals believed AI has enhanced the efficiency of recruitment processes. In performance management, 68% of respondents reported improvements through AI tools, with IT professionals expressing more favorable views (74%) than HR managers (62%). In terms of employee engagement, 54% observed a moderate to significant positive impact through tools like automated feedback systems and chatbots.

The survey also explored the application of specific AI tools. Resume screening tools were widely used, especially by HR managers, with 80% adoption in large-scale recruitment. Predictive analytics was reported by 60% of IT professionals as a method for forecasting employee performance and identifying talent gaps. Additionally, 55% of respondents, particularly HR managers, reported using AI-driven chatbots to address employee queries and assist in HR tasks.

Despite these positive trends, several barriers to AI adoption were identified. A lack of skilled personnel in AI implementation was reported by 65% of HR professionals and 55% of IT professionals. The high cost of AI tools was cited by 60% of participants as a significant barrier, while 45% noted resistance to change among employees, especially regarding AI's role in recruitment and performance evaluations.

Ethical concerns were also a prominent theme. Approximately 68% of respondents were concerned about algorithmic bias in hiring decisions, particularly related to gender, race, and age. Data privacy was a concern for 55%, with particular emphasis on the handling of sensitive employee data. Transparency in AI decision-making processes was seen as lacking, with 50% of HR managers emphasizing the need for more transparent systems to ensure fairness and trust.

Interview Results

The qualitative interviews provided deeper, contextual insights into the experiences and perspectives of HR professionals, IT managers, and senior executives regarding AI integration in HRM. Many participants described the AI adoption process as gradual, often beginning with simpler tools like chatbots before advancing to more complex applications such as predictive analytics.

In the area of recruitment, several HR managers highlighted significant efficiency gains from AI-powered resume screening tools, which reportedly reduced candidate shortlisting time by 40–50%. However, concerns were raised about the

potential for algorithmic bias affecting the fairness of the selection process.

Employee reactions to AI-based HR practices were also discussed, with many participants noting resistance among employees. This was particularly evident in performance evaluations, where there were fears that AI tools might not adequately capture the human aspects of job performance.

Ethical concerns continued to surface during the interviews. Participants emphasized issues such as data privacy, lack of transparency in decision-making, and algorithmic bias. Many HR professionals underscored the need for clear ethical guidelines and regular audits of AI systems to ensure equitable outcomes and avoid discrimination.

DISCUSSION AND ANALYSIS

This section interprets the results in light of existing literature on AI in HRM. The discussion will focus on how AI tools are currently being used, the barriers to adoption, the ethical concerns raised by participants, and the implications for HRM practices.

Perception of AI in HRM

The results of this study align with previous research that highlights the positive perception of AI's potential to enhance HR practices. AI has been shown to improve efficiency in recruitment, performance management, and employee engagement (Huang & Rust, 2021). However, the perceptions vary across roles. HR managers tend to be more cautious about the impact of AI, as they are more directly involved in human-centered HR activities, such as employee engagement and conflict resolution. On the other hand, IT professionals are more likely to embrace AI, given their familiarity with technology and data-driven tools.

The positive perception of AI in recruitment aligns with studies by Suen & Chen (2019), who found that AI-driven resume screening can significantly reduce recruitment time and improve the quality of candidate selection by focusing on data-driven metrics. However, HR managers also raised concerns about the risk of bias, which reflects findings from Binns (2020), who highlighted that AI systems can inadvertently perpetuate discrimination if they are trained on biased historical data.

Barriers to AI Adoption

The barriers to AI adoption identified in this study are consistent with the challenges highlighted in previous studies (Avasarala & Suresh, 2021). The lack of skilled workforce and the cost of AI tools are commonly cited as obstacles to AI adoption. The high cost of implementing AI tools, combined with the initial resistance from employees, especially in areas like performance evaluation, demonstrates the complex interplay between technology adoption and organizational culture.

Organizations in Khyber Pakhtunkhwa, especially smaller IT firms, may face resource constraints, making it difficult for them to invest in advanced AI tools. Moreover, the lack of technical expertise in AI implementation and integration may result in delayed adoption or improper usage of AI tools, which could undermine

their effectiveness.

Ethical Concerns and AI Governance

One of the most significant findings from both the survey and interviews is the ethical concerns raised by participants regarding AI in HRM. The concerns about algorithmic bias are particularly noteworthy, as previous studies have highlighted similar issues in AI-based recruitment tools (Raji & Buolamwini, 2019). This reflects broader societal concerns about AI systems perpetuating existing biases, especially in hiring and performance evaluations.

The ethical concerns raised in this study call for greater transparency in AI systems used in HRM. HR managers and executives emphasized the need for AI governance frameworks that ensure fairness, accountability, and transparency in AI-driven HR practices. This is consistent with recommendations from Crawford & Calo (2021), who argue for ethical audits and bias detection mechanisms to be embedded into AI tools used in recruitment and performance management.

AI Adoption and Organizational Culture

The integration of AI into HRM is not just a technological shift but also a cultural transformation. The findings show that while IT professionals are generally more open to AI tools, HR professionals and employees are more hesitant, particularly when AI systems are perceived to challenge traditional HR practices. This highlights the need for organizational change management strategies to facilitate AI adoption, as suggested by Susskind & Susskind (2020).

Organizations need to address concerns about AI replacing human judgment by emphasizing AI's role as a tool that augments human decision-making rather than replaces it. Employee buy-in is crucial for the successful integration of AI into HRM, and organizations must ensure that their AI systems are perceived as fair and transparent.

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