Predictive AI and AI-Measured KPIs in UAE Public Sector Organisations: The Mediating Role of Implementation Efficiency and Employee Readiness

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Abstract

This study examines how Predictive Artificial Intelligence (AI) Analysis and AI-measured Key Performance Indicators (KPIs) influence Human Resource (HR) effectiveness in the public sector of the United Arab Emirates (UAE), while also considering the mediating roles of Implementation Efficiency and Employee Readiness. A quantitative research design was employed, with data gathered through a structured questionnaire distributed to 379 employees across UAE federal government organisations, resulting in 271 valid responses. The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS. Findings demonstrate that Predictive AI Analysis and AI-measured KPIs significantly enhance HR effectiveness, whereas Implementation Efficiency and Employee Readiness did not show notable mediating effects, indicating that AI tools can directly strengthen HR functions. These insights emphasize the importance of AI's modular design and the structured nature of UAE public organisations in supporting effective adoption. The study offers important implications for both theory and practice by extending understanding of how AI-driven analytics can enhance HR effectiveness within a socio-technical framework while guiding policymakers and HR leaders on strategic AI implementation. However, the study's focus on the UAE public sector and reliance on self-reported data may limit generalisability. The research recommends that policymakers and HR leaders prioritise predictive analysis and performance measurement systems to accelerate AI integration, while future studies should explore long-term impacts and additional organisational factors across various sectors.

Keywords: Predictive AI Analysis – AI-measured KPIs – Human Resource Effectiveness – Implementation Efficiency – Employee Readiness

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Declaration

I hereby declare that this thesis is my own original work and has been prepared in accordance with the regulations of the University. All sources of information, data, and ideas from other authors have been duly acknowledged through appropriate citations and references.

This work has not been submitted, either in whole or in part, for any other academic award or qualification at this or any other institution. The findings, interpretations, and conclusions presented in this study are the result of my independent research and analysis.

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List of Abbreviations

Abbreviations	Meaning
GCC	Gulf Cooperation Council
TAM	Technology Acceptance Model
AI	Artificial Intelligence
HRM	Human Resource Management
HR	Human Resource
UAE	United Arab Emirates
PAI	Predictive AI
ER	Employee Readiness
IE	Implementation Efficiency
KPIs	Key Performance Indicators
SPSS	Statistical Package for the Social Sciences
PLS-SEM	Partial Least Squares Structural Equation Modelling
HTMT	Heterotrait - Monotrait Ratio
AVE	Average variance extracted
VIF	variance inflation factor
A	Cronbach's Alpha
CR	Composite Reliability
SMEs	Small and Medium Enterprises
ROI	Return on Investment
SD	Standard Deviation
R^2	Coefficient of Determination
Q^2	Cross-validated Predictive Relevance
RMSE	Root Mean Square Error
MAE	Mean Absolute Error

Chapter 1: Introduction

1.1 Research Background

The recent rapid progress of artificial intelligence (AI) is transforming the organisational processes in all industries, and one of the most transformed gaps is Human Resource Management (HRM) (Wahdaniah et al., 2023). Traditional HR processes are being redefined by AI-driven systems (like predictive analytics) and AI-measured key performance indicators (KPIs) that improve the use of data to make decisions, plan workforce, and manage their performance (Cappelli et al., 2018; Hmoud and Varallyai, 2020; Kaur et al., 2023). Instead of applying subjectivity and hindsight to gauge performance, organisations are progressively turning to algorithmic systems to come up with prospective insights and objective performance metrics.

In the context of this global change, the public sector of the United Arab Emirates (UAE) is an especially topical one. The UAE has a positive outlook toward AI implementation, which is one of the key measures in its national digital transformation agenda since, for example, the UAE Artificial Intelligence Strategy 2031 (GOV, 2018) is aimed at making the country a global leader in the field of AI implementation. The role of the public institutions in the overall socioeconomic development of a country is in the focus, and the improvement of their functioning efficiency and strategic responsiveness is the matter of the policy. AI application into HR operations is consistent with this aim as it assists in the planning of the workforce based on evidence, transparency, and accountability of the institution (Alsaif and Aksoy, 2023).

Predictive AI analysis allows organisations to predict the future workforce trends in advance using both historical and real-time information. Predictive models can also be used in HR to estimate the risk of employee turnover, predict skill gaps, and predict performance trajectories, enabling departments to move beyond problem-solving to talent management in the proactive sense (Rustagi and Goel, 2022; Mohture, 2023). In addition to this ability, AI-quantified KPIs complement any performance assessment system by automating data collection and analysis, eliminating bias, and

real-time monitoring of strategic goals (Mikalef and Gupta, 2021). A combination of these technologies provides the capacity to enhance HR efficacy through a better level of accuracy, accountability, and strategic alignment.

Besides these benefits, the adoption of AI in HR also comes with numerous organisational and ethical issues. Issues of bias in algorithms, their transparency, fairness in choosing decisions, and data privacy in employees have been a central topic in academic and policy discussions (Tambe et al., 2019; Kumar et al., 2022). Implementation can thus not work effectively without the presence of technological capability as well as sound governance systems and professional skills that would lead to responsible and sustainable implementation.

Considering the strategic relevance of the UAE public sector and the rapid implementation of AI technologies, there exists a necessity of the empirical study of how the AI applications affect the HR performance in the given context. The gap in the given study is solved by analysing how Predictive AI Analysis and AI-measured KPIs affect HR effectiveness in UAE public-sector organisations to provide evidence-based insights regarding their organisational value and dynamics of implementation.

1.2 Research Problem

The adoption of Artificial Intelligence (AI) into HR practices and processes has become seen as a disruptive move in organizations to allow making decisions based on data and to improve operational efficiency (Alsaif and Aksoy, 2023; Ganatra and Pangya, 2023). The use of AI-based methods with predictive analytics and AI-calculated Key Performance Indicators (KPIs) has some potential, but it is faced with a number of challenges, which restrict its efficient application. These issues are of the greatest concern in the framework of the UAE public sector, where innovation and digital transformation are strategic priorities, and the gap between the ambitions of the policies and the reality of operation has arisen (Kumar et al., 2022).

The issue of readiness and ability of HR professionals that may successfully adopt AI technologies is a major concern. Digital innovation is a priority in the UAE organizations, and numerous employees working in the public sector in the HR sector

may not have the necessary technical capabilities and experience to effectively use AI systems, which can potentially disconnect the results of AI-based insights from the real HR practices (Enholm et al., 2021). The sharp technological changes also contribute to this skills gap, requiring the HR staff to constantly learn and adapt.

The other severe issue is the question of ethical problems and biased issues. Even though AI can enhance the objectivity of making decisions, biased or incomplete data may result in unjust decisions, especially during recruitment, performance evaluation, and employee development. These consequences may cause a lack of trust in employees and prevent the adoption of AI systems in HR (Kumar et al., 2022; Tambe et al., 2019).

Also, the issue of data privacy and security is also a hindrance to the use of AI. The HR practices relying on artificial intelligence entail gathering and processing of particularly susceptible data about an employee, so the organisation is obligated to keep this data confidential and comply with data privacy and protection regulations (Tambe et al., 2019; Cappelli et al., 2018).

Lastly, organizational and cultural issues have a bearing on AI implementation. Adoption of predictive AI and adoption of AI-based KPIs cannot be successful without addressing a range of factors, including technological capacity and alignment with both the values and expectations of the workforce and the specific organizational culture of the UAE public sector. The lack of attention to these aspects can cause poor performance and decreased employee interest in AI projects, as well as unwillingness to accept AI innovations (Akter et al., 2023; Bujold et al., 2023).

1.3 Rationale for the Research

The rationale for this study emerges from the growing importance of AI as a transformative force in HRM, considering the public sector businesses of the UAE. As the UAE continues to establish itself as a global leader in technology innovation, hence it has been realised that the incorporation of the AI systems into HR procedures is not only appropriate but also critical to maintain the competitive advantage of the country. However, the actual application of AI-driven tools such as predictive analysis and AI-

measured KPIs in the public sector requires further investigation and understanding, which is the core foundation for considering the current research.

This research can be said to be important as it addresses and overcomes the gap existing between the strategic goals of the UAE to leverage the AI systems to improve the overall efficiency of the public sector and the actual preparedness and capabilities of the HR departments to implement these technologies. This research intends to provide important insights into the influence of predictive AI and AI-measured KPIs on the effectiveness of HR processes, thereby informing more significant policymaking, improving HR practices, and eventually contributing to the broader goals of the country related to its innovation and excellence in governance.

Furthermore, the emphasis of this research on the public sector organisations of the UAE highlights its importance, as the public sector organisations seek to optimise their operations based on cutting-edge technologies, while recognising the challenges and opportunities that are associated with the AI systems being used in HR. The findings of this research offer practical advice which can help the organisations to overcome AI adoption related challenges and hence to ensure that the AI-driven HR practices are properly linked with the unique cultural and organisational context within the UAE.

1.4 Aim of the Study

The aim of this study is to examine the impact of predictive AI analysis and AI-measured Key Performance Indicators (KPIs) on HR effectiveness in UAE public sector organisations, and to analyze the mediating roles of implementation efficiency and employee readiness in shaping this relationship.

1.5 Research Objectives

The objectives of the study are –

1. To assess the direct effects of predictive AI analysis on HR effectiveness in UAE public sector organisations.

2. To evaluate the contribution of AI-measured KPIs to HR effectiveness in the UAE public sector.
3. To examine how implementation efficiency and employee readiness mediate the relationship between AI practices and HR effectiveness.
4. To generate theoretical and practical implications for strengthening AI-enabled HR transformation in UAE public sector organisations.

1.6 Research Questions

The key research questions that are answered in this study are –

1. What are the direct effects of predictive AI analysis on HR effectiveness in UAE public sector organisations?
2. How do AI-measured KPIs contribute to HR effectiveness in the UAE public sector?
3. How do implementation efficiency and employee readiness mediate the relationship between AI practices (predictive AI analysis and AI-measured KPIs) and HR effectiveness in UAE public sector organisations?
4. What theoretical and practical implications can be derived to strengthen AI-enabled HR transformation in UAE public sector organisations?

1.7 Significance of the Research

The research has relevance because it offers empirical data regarding the effectiveness of predictive AI analysis and AI-measured KPIs in the context of HR in UAE organizations within the public sector. Although the adoption of AI in HRM is being studied more, much of the available literature is focused on the experience in the private sector, and there is little empirical data on government agencies. This leaves an apparent empirical gap on how AI-based HR practices operate in the context of the public-sector setting and, specifically, in developing digital economies (AlNuaimi et al. 2022).

Theoretically, the research would add to the amassing of literature on AI-enabled HRM by looking at the mediating functions of both implementation efficiency

and employee preparedness on the direct impacts of the AI practices on HR effectiveness. The introduction of these mediating mechanisms helps the research to come out of the context of descriptive research of the adoption of AI, and it offers a systematic explanatory framework of how and under what circumstances AI promotes HR outcomes. By doing so, the research will fill in a literature gap regarding the process through which AI technologies connect to HR effectiveness (Bughin et al. 2018).

Practically, the findings provide evidence-based recommendations to policymakers and the HR leadership in the UAE in the public sector. Particularly, the research can point out how the efficiency of implementation and employee preparedness determine the success of AI-based HR initiatives so that organizations can design training programs, change management policies, and governance structures that facilitate digital transformation (Al Saadi 2025) better.

The study has strategic links with the overall digital transformation agenda of the UAE, as it provides practical information and understanding of how AI can enhance workforce management and corporate performance. Instead of reinventing the strategies at the national level, this research offers an empirical basis that facilitates the informed decision-making on the investment and implementation of AI in HR functionalities (Al-Ali 2025).

1.8 Thesis Structure

The report has been divided into key chapters, which are briefly described below.

Chapter 1: Introduction

This chapter introduces the research topic, outlines the research problem, aim, objectives, research questions, and highlights the significance of the study.

Chapter 2: Literature Review

This chapter critically reviews existing literature on predictive AI, AI-measured KPIs, HR effectiveness, and digital transformation in HRM, identifying theoretical and empirical gaps that inform the research model.

Chapter 3: Conceptual Framework and Hypotheses Development

This chapter develops the conceptual framework and presents the research hypotheses, grounded in the reviewed literature and theoretical foundations.

Chapter 4: Methodology

This chapter outlines the research design, data collection methods, measurement instruments, sampling approach, and analytical techniques used to test the proposed model.

Chapter 5: Findings

This chapter presents the empirical results derived from the data analysis, including measurement model and structural model assessments.

Chapter 6: Discussion

This chapter interprets the findings in relation to existing literature and theory, highlighting contributions and contextual implications for the UAE public sector.

Chapter 7: Conclusion and Recommendations

This final chapter summarises the key findings, outlines theoretical and practical contributions, discusses limitations, and proposes directions for future research.

1.9 Chapter Summary

This chapter provides an overview of the research which is aimed to study the influence of predictive AI analysis and AI-measured KPIs in HR management in the public sector businesses in the UAE. The chapter introduces the topic of the research and describes the research problem that the study focuses upon, while highlighting the challenges of incorporating AI-powered technologies into HR practices, such as related to technical preparedness, potential biases, data protection, and cultural alignment.

The existing arguments have emphasised the importance of this study in overcoming the gap between strategic goals and practical AI adoption in HR in the public sector. The significance of the study has been presented in the chapter as well, with a focus on its contribution to theoretical knowledge as well as in practical applications, particularly in improving the efficiency of HR performance in the public sector businesses in the UAE and their decision making.

Chapter 2: Literature Review

2.1 Introduction

2.1.1 The Research Focus

The contemporary scenario of Human Resources (HR) management is undergoing a significant transformation, largely attributed to the integration of cutting-edge technologies (Wahdaniah, et al., 2023). One such paradigm-shifting advancement is the infusion of Predictive Artificial Intelligence (AI) analysis and the utilisation of Artificial Intelligence-Measured Key Performance Indicators (KPIs) (Cappelli, et al., 2018; Hmoud & Varallyai, 2020; Kaur, et al., 2023). This research seeks to delve into the implications and significance of adopting these innovations within the context of United Arab Emirates (UAE) public sector organizations.

The focal point of this study is to critically evaluate the role of Predictive AI analysis in HR activities and its interaction with AI-Measured KPIs, particularly within the unique setting of the UAE public sector. The integration of predictive AI in HR is a multifaceted phenomenon that extends beyond mere automation. It encompasses the use of advanced algorithms and machine learning models to anticipate future trends, identify potential talent, and streamline decision-making processes in HR management (Kaur, et al., 2023). By researching the current academic debates, the first objective of this research is to critically identify and assess the implications of introducing predictive AI analysis in the realm of HR activities.

Moving forward, the research aims to critically analyse the application of predictive AI analysis specifically in the measurement of HR activities concerning the effectiveness of KPIs within UAE public sector organizations. Traditional HR practices often rely on conventional KPIs to assess performance, but the integration of AI introduces a paradigm shift by introducing a data-driven approach to measure and enhance these key indicators (Alsaif & Aksoy, 2023). The second objective, therefore, is to meticulously examine the usage of predictive AI analysis in conjunction with KPIs, determining its impact on the efficiency and effectiveness of HR practices in the public sector of the UAE.

Moreover, this research aspires to critically evaluate how the effectiveness of HR activities can be measured through the use of predictive AI analysis, explaining the relationships within the UAE public sector. The third objective involves an in-depth exploration the influences that predictive AI may exert on HR outcomes, considering the unique organisational and cultural context of the UAE public sector. This involves identifying and understanding the intricate relationships between AI-driven insights, human decision-making, and the overall efficacy of HR practices in the public sector.

Ultimately, the research endeavours to generate novel academic insights derived from the outcomes of the study. By synthesising the findings, the fourth objective aims to contribute to the existing body of knowledge and offer fresh perspectives on the effectiveness of integrating AI analysis in assessing HR activities within the UAE public sector. This includes proposing recommendations for HR practitioners, policymakers, and researchers to navigate the challenges and harness the potential benefits associated with the revolutionised HR environment driven by predictive AI and AI-measured KPIs. Thus, this research aims on a journey to determine the intricacies of revolutionising HR through the implications of predictive AI analysis and AI-measured KPIs, considering a focus on the distinctive context of the UAE public sector.

2.1.2 Importance of Integrating AI in HR activities

The integration of AI in HR activities is increasingly recognised as a transformative force in reshaping the traditional models of talent management, workforce optimisation, and organisational efficiency (Alsaif & Aksoy, 2023). This growing importance has developed from the unique capabilities that AI brings to HR, offering advanced data analytics, predictive insights, and automation that significantly enhance the strategic value of HR functions (Ganatra & Pangya, 2023). In this exploration, the key factors behind the growing significance of integrating AI in HR activities have been focused upon.

Figure (2- 1): AI in HR



Sources: developed by Visier, Inc., (2024)

One of the foremost advantages of incorporating AI in HR lies in its ability to streamline and automate routine tasks, thus freeing HR professionals from time-consuming administrative tasks. Routine and repetitive activities such as resume screening, candidate sourcing, and the initial stages of recruitment can be efficiently handled by AI algorithms (Kumar, et al., 2020). This not only accelerates the hiring process but also allows HR professionals to redirect their focus towards more strategic and value-added aspects of talent management, such as employee engagement, development, and retention (Soni, 2022; Kumar, et al., 2020).

Thus, here it may be analysed that, with AI implementation in HR practices, it is possible for HR teams to optimise their workforce more efficiently. AI systems can streamline and automate the tasks of the HR teams, which can be analysed as allowing the HR teams to save more time while handling the HR tasks more swiftly and accurately. Here, the automation that AI offers to HR tasks can also be realised as having key implications for the HR teams to review their employees, such as in respect of their performances, performance appraisals, and thus, assist in providing key feedback to them as well, which in turn can benefit the overall performance of the organisation (Soni, 2022; Kumar, et al., 2020).

Furthermore, the data-driven nature of AI enables HR departments to make more informed and evidence-based decisions (Nyathani, 2023; Patel, 2023). Traditional HR practices often rely on intuition and past experiences, but AI introduces a quantitative dimension to decision-making (Soni, 2022). Predictive analytics, for instance, can forecast trends in employee performance, turnover, and even identify potential skill gaps, thereby empowering HR professionals to proactively address challenges before they deteriorate. This predictive capability enhances strategic workforce planning, ensuring that organisations are well-prepared for future talent needs (Malisetty, et al., 2017; Tambe, et al., 2019).

The data-driven nature of the AI systems, therefore, can be seen as beneficial considering the vast amounts of data that the AI systems are capable of assessing. It may be argued here that if HR decision making depends on traditional forms of practices, then subjectivity could have key impacts on such decision making (Nyathani, 2023). However, with AI enabling large datasets to be analysed, such decision making now becomes more possible to be based on an objective analysis, as may be analysed here, such as in the case of predictive analysis, which in turn benefits the talent management requirements of an organisation (Malisetty, et al., 2017; Tambe, et al., 2019). With such developments, it can also be analysed that the AI systems can help the HR teams in targeted interventions to solve their key HR related issues.

In the area of talent acquisition, AI plays a key role in supporting the application processes, screening and employee data analysis, and conducting preliminary interviews or assessments of candidates, which help in mitigating biases as well (Vivek, 2023; Sentamilselvan, et al., 2023; Pandya, 2021). Traditional recruitment processes are vulnerable to human biases, which may be conscious or unconscious, and can result in overlooking qualified candidates or preserving consistency within the workforce. AI-driven recruitment tools can be designed to assess candidates based on objective criteria, thus minimising the impact of biases, while making the processes easier and faster to accomplish (Sentamilselvan, et al., 2023). This also aligns with ethical considerations but also contributes to the creation of a more innovative and dynamic workforce (Vivek, 2023).

Thus, clearly, a strong and positive implication of AI in HR recruitment processes and talent acquisition, can be said to have been realised. This can also be related to the capability of the AI systems to assess vast amounts of data, which can be said to have a key role to play in matching the job requirements with the qualifications, talents, and skills of the applicants (Pandya, 2021). The algorithms that are considered by the AI systems can be understood to play a key role in this regard, to assess the potentials of the applicants, thus assisting the HR managers to make suitable recruitments (Sentamilselvan, et al., 2023). The assessments of the candidates, thus, may be realised as being possible to be evaluated more accurately through the contents that the AI systems assess, and since their assessments are expected to be more accurate than the assessments done by human beings, thus risk mitigation is also realised as being possible. This is understood as implying that the AI systems have the potential to protect an organisation from making any incorrect hirings for their teams (Sentamilselvan, et al., 2023; Vivek, 2023).

Employee engagement and retention, which are integral components of effective HR management, also benefit significantly from AI integration (Rao, et al., 2020; Rajeshwari, et al., 2023). AI-powered tools can analyse employee sentiment, feedback, and performance data to identify patterns and potential areas for improvement. By gaining insights into the factors influencing employee satisfaction and engagement, HR professionals can implement targeted strategies to enhance the overall workplace experience (Sari, et al., 2020; Rao, et al., 2020). Moreover, AI-driven personalization in learning and development initiatives ensures that employees receive customised training programmes, allowing continuous skill development and career growth (Das, et al., 2023).Thus, here, it may be analysed that, since AI is capable of assessing large datasets, the benefits are experienced in understanding the levels of employee engagement in the organisation, based on which the HR teams can make improvements in their employee engagement strategies. Through applications of AI tools and technologies, it can be possible to assess the mood, positivity levels, and perceptions of the employees, which can be analysed as essential to understanding what the employees want from their HR managers, such as in respect of their training, or

development, or career progression, or in discussing their challenges and issues (Das, et al., 2023; Rao, et al., 2020).

Another crucial aspect of AI in HR is its contribution to creating a smooth and enhanced employee experience (Menaka, 2023). Chatbots and virtual assistants powered by AI provide employees with instant access to HR-related information, assistance, and support, thereby improving their communication and accessibility. This not only enhances employee satisfaction but also allows HR professionals to allocate their time and expertise to more complex and strategic issues (Rajeshwari, et al., 2023). Thus, the importance of integrating AI in HR activities is emphasised by its potential to revolutionise traditional practices, enhance efficiency, and elevate the strategic impact of HR within organisations (Ganatra & Pangya, 2023).

Thus, it may be noted here that the understanding of AI enabling a smoother work experience for organisational employees is owing to the key benefits that the AI systems can provide overall to HR operations and employee experiences, such as the automation of services, improved data analysis, and improved guidance for more suitable strategies that can benefit the employees and enhance their overall experience and performance at work (Soni, 2022; Kumar, et al., 2020). Tools such as chatbots, and virtual assistants, in this regard, may be realised as assisting the employees' tasks, thus helping to be more efficient, which therefore makes their experiences smoother at work (Rajeshwari, et al., 2023).

2.1.3 Key Themes

The literature review has considered a number of key themes that collectively reflect the intricate relationship between HR management and the integration of Predictive AI Analysis along with AI-Measured KPIs in the context of UAE public sector organizations. The literature review begins by exploring the foundational theories and frameworks that underpin HR management. As traditional HR management undergoes significant transformations, the review examines how established theories are adapting to the infusion of AI technologies.

A central theme explores the multifaceted applications of Predictive AI Analysis in HR activities. From talent acquisition to workforce planning, the literature review analyses how predictive AI models offer advanced analytics, forecasting, and data-driven decision-making capabilities. Simultaneously, the review focuses on the challenges and ethical considerations associated with the implementation of predictive AI in HR. The review also focuses upon the conceptualization and significance of KPIs in HR, highlighting the shift from traditional KPIs to those measured through AI.

A critical theme examines the interaction between predictive AI analysis and KPIs in HR. The literature review assesses existing models and frameworks that organisations employ to seamlessly integrate these two elements. Simultaneously, the review identifies challenges and considerations, acknowledging the potential pitfalls and complexities of combining predictive AI analysis with KPIs. Focusing specifically on the UAE public sector, the review also explores the distinctive HR practices, challenges, and opportunities within this context. Understanding the intricacies of HR management in the public sector is imperative for contextualizing the subsequent discussion on the applicability and impact of predictive AI analysis and AI-measured KPIs in this specific organisational setting.

The synthesis of global trends with the unique features of the UAE public sector forms another major theme. The review investigates how predictive AI analysis and AI-measured KPIs are being embraced or resisted in the UAE public sector, shedding light on the opportunities and challenges faced by organisations in this region. The literature review then investigates the complexities of relationships within HR effectiveness when AI is introduced. It analyses the interplay between predictive AI, human decision-making, and the overall efficacy of HR practices in the UAE public sector. The final theme involves synthesising the information gathered throughout the review. It highlights the key findings, identifies gaps in the existing literature, and paves the way for a more specific understanding of how predictive AI analysis and AI-measured KPIs impact HR activities in the UAE public sector.

2.2 Theoretical Framework

2.2.1 Overview of HR Theories and Frameworks

Human Resources (HR) management is a dynamic field that has evolved over time, guided by various theories and frameworks that aim to understand and optimise the management of an organisation's most valuable asset – its people (Islam, 2015; Richman, 2015). The overview of HR theories and frameworks provides a foundation for comprehending the historical and theoretical context against which the integration of Predictive AI Analysis and AI-Measured KPIs in the UAE public sector is examined.

The evolution of HR theories can be traced back to the early 20th century, when industrialisation and scientific management principles shaped early organisational structures (Rotich, 2015; Aslam, et al., 2014). Frederick Taylor's scientific management emphasised efficiency and standardised work processes, laying the groundwork for early personnel management practices. This evolved into the Human Relations Movement, directed by researchers like Elton Mayo, which recognised the importance of social and psychological factors in workplace productivity. Theories such as Maslow's Hierarchy of Needs and Herzberg's Two-Factor Theory further contributed to understanding employee motivation and satisfaction (Rotich, 2015; Al Marri, et al., 2018).

The late 20th century witnessed a paradigm shift towards strategic HR management. Influenced by management scholars like Michael Porter, organisations began to view human resources not just as a cost but as a strategic asset contributing to competitive advantage (Deadrick & Stone, 2014). Strategic HR management emphasises aligning HR practices with organisational goals and objectives. This shift laid the groundwork for contemporary HR practices that emphasise talent development, employee engagement, and organisational culture (Rotich, 2015; Lee, 2021; Bas, 2012).

In recent decades, contemporary HR theories have emerged to address the complexities of a rapidly changing global business environment. The Resource-Based View (RBV) of HR emphasises the strategic value of human capital and how it

contributes to sustained competitive advantage (Gerhart & Feng, 2021). The High-Performance Work Systems (HPWS) theory suggests that certain HR practices, when integrated and aligned, can lead to superior organisational performance (Mahdy & Alhadi, 2021). Additionally, the concept of Employee Value Proposition (EVP) emphasises the mutual exchange of value between employers and employees, focusing on creating a positive employer brand to attract and retain top talent (Panneerselvam & Balaraman, 2022).

The evolution of HR theories has been closely intertwined with advancements in technology. The advent of HR Information Systems (HRIS) in the late 20th century marked a significant leap in the ability of HR to manage data and automate administrative tasks (Johnson, et al., 2016). This paved the way for the current era, where the integration of AI technologies is reshaping HR practices.

Predictive AI Analysis and AI-measured KPIs represent the latest developments in leveraging technology to enhance decision-making, talent management, and overall HR effectiveness (Chytiri, 2019; Richman, 2015).

While HR theories have provided valuable insights, they are not without challenges and critiques. Traditional theories have been criticised for being overly deterministic and ignoring the diverse needs and motivations of individuals. Contemporary theories, while more distinctive, face challenges in adapting to the fast-paced, digital era. The integration of AI introduces new considerations, including ethical concerns, biases in algorithmic decision-making, and the potential risks of HR processes losing the power of humans (Sharma, 2021; Ferris, et al., 2004).

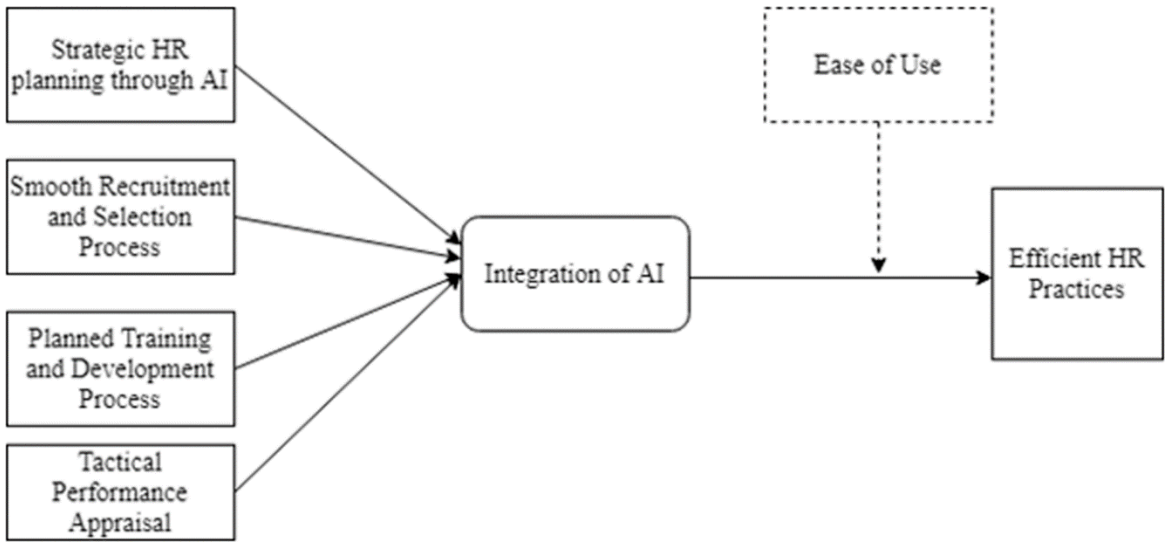
2.2.2 Integration of AI into HR Theories

The integration of AI into HR theories represents a paradigm shift that is reshaping the traditional frameworks guiding talent management, employee relations, and organisational effectiveness (George & Thomas, 2019). This transformation is supported by the unprecedented capabilities of AI, which brings advanced analytics, machine learning, and predictive modelling into the area of HR management (Saxena, 2020). This exploration focuses on the ways in which AI is becoming an integral part

of HR theories, augmenting and redefining established frameworks to address the complexities of the modern workforce (Palos-Sanchez, et al., 2022; Saxena, 2020; Patel, 2023).

Traditional HR theories often relied on qualitative data and subjective assessments in decision-making processes. With the integration of AI, HR is transitioning towards a more data-driven approach (Nyathani, 2023). AI technologies can analyse vast datasets, identify patterns, and generate insights based on which actions can be taken. This aligns with the broader shift in organisational management towards evidence-based decision-making (Jogarao, et al., 2023). The infusion of AI allows HR professionals to make informed choices supported by quantitative analysis, thus enhancing the precision and effectiveness of decision-making processes (Patel, 2023; Murugesan, et al., 2023).

Figure (2- 2): AI Integration into HR



Sources: developed by Singh & Shaurya, (2021)

It may be noted here that data-driven decision making in connection with predictive AI and AI-measured KPIs has the potential to revolutionise organisational strategies, as predictive AI can help an organisation to analyse its data to guide its future actions and strategies. This, in turn, can enable an organisation to better address

its future risks while optimising its resources and potential to effectively serve its customers. The role of the AI-measured KPIs here is crucial, as they offer quantitative measurements so that an organisation's predictive business models can be evaluated, which in turn would guide its strategic direction (Gryncewicz, et al., 2023; Nyathani, 2023).

It may be analysed here that, data-driven decision making has its key benefits from the capability of AI systems to deal with and assess vast amounts of data, which in the case of employees can be realised as including data such as resumes of candidates, social media profiles of employees, employee performance data, and assessments of employees' strengths and weaknesses (Jogarao, et al., 2023; Nyathani, 2023; Patel, 2023). All of such information can clearly be realised as having key implications for the HR teams to make use of, to drive their strategies and decisions in regard to improving the skills and performances of their employees (Gryncewicz, et al., 2023; Nyathani, 2023).

In the context of HR management, the application of AI systems to guide data-driven decision making can be said to transform the manner in which HR teams can process their various activities, from employee recruitment to their effective retention measures. With AI-based KPIs, HR teams can further utilise the measures so that their actions can be aligned with the insights that are drawn based on factual data, and hence the outcomes can be expected to be more positive and effective for the overall performance of a business. In the process, employee experiences can be customised as well, further improving the overall connection between an organisation and potential and talented employees (Vedapradha, et al., 2023).

Here, it may be analysed therefore, that, with the KPIs being analysed based on the AI systems, it becomes possible for the HR teams to evaluate the best fit of candidates for their organisation, while also being able to reflect on the key areas of improvement as may be required by the individual employees. The idea that factual data gets assessed accurately by the AI systems can thus be realised as benefiting the HR teams significantly to help them decide on strategies that can most effectively align with the HR goals and organisational goals with the goals of employee management (Vedapradha, et al., 2023). It may also be understood here that, with the AI systems, it

also becomes possible for the HR teams to have a more comprehensive assessment of their employees in determining the nature of their work behaviours both individually and in groups, which can further help them to determine key employee strategies for improved effectiveness of their performances.

The incorporation of AI introduces predictive HR analytics, which is a revolutionary concept that excels beyond traditional HR forecasting methods. Predictive analytics leverages machine learning algorithms to analyse historical data and identify trends, enabling HR practitioners to anticipate future workforce needs, attrition rates, and skill gaps (Nyathani, 2023). This not only enhances workforce planning but also empowers organisations to proactively address challenges, optimise resource allocation, and strategically position themselves in a dynamic business environment (Xiao, et al., 2023; Gryncewicz, et al., 2023).

Thus, when predictive HR analytics is stated here, it reflects the possibilities that HR teams tend to have in understanding and managing their workforces better, as they can improve assessments and decisions based on AI-driven data analytics.

Here, it may also be noted that since such AI based data analysis can involve accurately assessing data from the past and present together to reflect on potential opportunities and challenges for the future, this could imply more suitable chances to develop effectively for the future, by preparing their employees accordingly (Nyathani, 2023). Naturally, therefore, such analysis can be realised as having key implications for an organisation and its HRM to deal with the dynamic nature of the business environment, as may be realised (Xiao, et al., 2023; Gryncewicz, et al., 2023).

In traditional HR theories, talent acquisition relied heavily on subjective evaluations, interviews, and resume screenings. AI, however, is revolutionising this process by introducing automation and predictive capabilities (Vedapradha, et al., 2023). AI-driven tools can scrutinize large volumes of resumes, assess candidates based on predefined criteria, and even predict candidate success based on historical data. This not only accelerates the recruitment process but also minimises biases, leading to more diverse and equitable hiring practices (Geetha & BhanuSree, 2018).

Thus, it may be concluded here that the capability of the AI systems to automate HR tasks proves to be of a major advantage in this regard, helping the HR teams to

conduct their recruitment processes faster, and with greater accuracy. Along with automation, the ability to assess vast amounts of data has also been realised here as benefiting HR in its recruitment processes, as may be reflected upon through the existing literature findings (Vedapradha, et al., 2023; Geetha & BhanuSree, 2018). An interesting factor here that has been noted is the advantage of the objectivity that AI provides as it uses its predictive analytics, machine learning, and natural language processing tools to evaluate the employee recruitment data, which can be analysed as further contributing to more effective recruitment decisions from the HR teams.

Employee engagement and performance management have traditionally been guided by theories emphasising motivation, feedback, and recognition. AI enhances these aspects by providing real-time insights into employee sentiments, engagement levels, and performance metrics (Sari, et al., 2020). Sentiment analysis tools powered by AI can analyse employee feedback, social interactions, and communication patterns, offering a comprehensive understanding of the mood and morale of the workforce.

AI can also facilitate continuous performance monitoring, enabling timely interventions and personalised development plans (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

It may thus be analysed here that with AI in HR, it is possible for HR managers to better assess their employees, which can guide them to develop such strategies and measures within the workplace that can have key impacts on the overall performance, commitment levels, and engagement of the employees (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023). In other words, if the AI systems can help the HR teams to determine factors that might be demotivating the employees at work, then the HR teams can work on eliminating such factors to ensure that the employees are satisfied and more content. Thus, the role of AI here can be realised as not only helping with the assessments but also offering guidance or a roadmap for the HR teams to make their future decisions.

HR theories have long recognised the importance of employee training and development. AI transforms traditional learning and development approaches by introducing adaptive learning systems (Ezzaim, et al., 2023). These systems use AI algorithms to customise training programs based on individual learning styles,

preferences, and skill gaps (Joshi, 2023). This personalised approach ensures that employees receive targeted and relevant training, allowing continuous learning and skill development aligned with organisational objectives (Gligorea, et al., 2023; Kabudi, et al., 2021).

This may be analysed as one of the most important implications offered by the AI systems on HR activities, since employee training and development can be realised as having a direct impact on their performances as well as on the overall performance of an organisation (Ezzaim, et al., 2023). Thus, if AI allows identification and analysis of key skills gaps or challenges faced by the employees, then the HR teams can customise their training programs to particularly improve the identified skills. As this shows a personalised approach to employee training, it may also be analysed here that such efforts from the HR teams can also have a strong impact on the engagement levels of the employees (Gligorea, et al., 2023; Kabudi, et al., 2021). In such scenarios, employees may feel more committed while they receive continuous development and learning opportunities from their organisation.

The integration of AI into HR theories extends to employee well-being initiatives. AI-powered tools can monitor employee workloads, stress levels, and overall well-being. Chatbots and virtual assistants can provide timely resources, support, and information to employees, contributing to a healthier work-life balance (Cramarenco, et al., 2023; Kaur, 2023). AI-driven insights into well-being contribute to the development of policies and practices that prioritise employee mental health and overall job satisfaction (Smita, et al., 2023; Kakkad & Suresh, 2023).

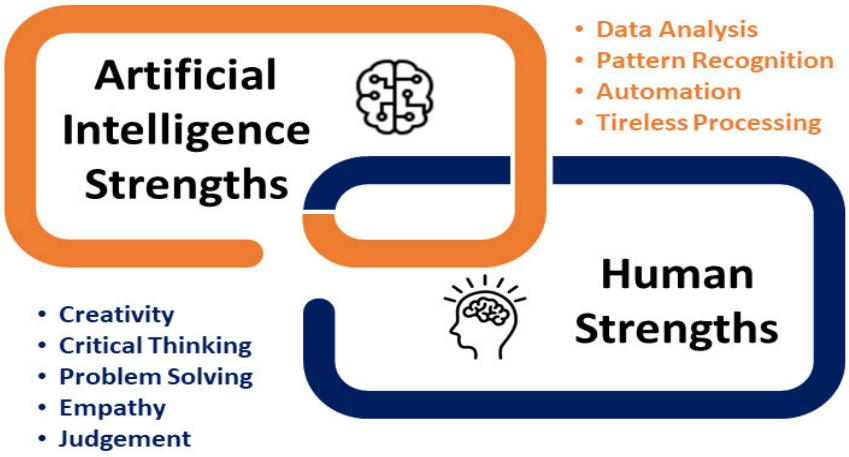
While the AI systems here can be realised as making key utilisation of its tools and advances, such as the chatbots and virtual assistants, it may also be noted here that the systems are contributing to overall employee wellbeing and work-life balance as they enable personalised efforts from the HR teams for the employees to experience improved training, career progression, learning and development, and their overall engagement levels being improved in the process as well, as have been realised from the review of the literature. All these factors being combined, the HR teams can expect that the overall experience of the employees being improved further reflected through

their wellbeing and satisfaction levels at work (Smita, et al., 2023; Kakkad & Suresh, 2023; Kabudi, et al., 2021; Nyathani, 2023; Gryncewicz, et al., 2023).

As AI becomes an integral part of HR theories, addressing ethical considerations and mitigating biases also becomes crucial. Traditional HR theories may not have clearly addressed the ethical implications of algorithmic decision-making. The integration of AI requires a specific understanding of fairness, transparency, and accountability. HR professionals need to be cognizant of the potential biases present in AI models and implement strategies to ensure fair and equitable outcomes (Tuffaha, 2023; Matthew J & Aizenberg, 2022). The integration of AI into HR theories does not imply a replacement for human judgement but rather emphasises collaboration between human expertise and AI capabilities. The coexistence of human and machine intelligence is essential for harnessing the full potential of AI in HR. HR theories need to evolve to incorporate the dynamics of human-AI collaboration, addressing issues of trust, communication, and the ethical use of AI within organisations (Zirar, et al., 2023; Tinguely, et al., 2023).

Thus, human-AI collaboration may be analysed as offering a kind of symbiotic relationship that has the potential to take advantage of the key skills and capabilities of both AI systems, and human intelligence, which in the case of HR activities can be realised as offering the potential to optimise the tasks and activities as a whole. Here, it may be realised that while the AI systems can offer large dataset analysis, and objectivity in their assessments to guide the HR teams, the human element from the HRM can further improve upon the AI's contribution through the application of human intelligence, human intuitions, empathy, knowledge, experience, and understanding. This collaboration, therefore, can be understood as having the potential to allow an overall improved HR stance to help improve employee practices and performance in an organisation.

Figure (2- 3): Human-AI Collaboration



Sources: developed by Sharma, (2024)

Thus, the integration of AI into HR theories marks a transformative era in the field of HRM. The infusion of advanced analytics, predictive modelling, and automation reshapes how HR professionals approach decision-making, talent management, and employee relations. As organisations embrace AI technologies, HR theories must evolve to accommodate these changes, ensuring that the collaborative relationship between human expertise and AI capabilities maximizes the positive impact on organisational effectiveness and workforce dynamics.

2.2.3 Theoretical Foundations for Predictive AI Analysis and KPIs in HR

The integration of Predictive AI Analysis and KPIs into HR practices is supported by strong theoretical foundations that draw from various disciplines, including data science, organisational behaviour, and strategic management. These theoretical frameworks provide the conceptual basis for understanding the interactions between predictive AI analysis and KPIs in HR, reflecting the mechanisms through which these innovations enhance decision-making, talent management, and overall organisational performance.

- **Data-Driven Decision Making:**

The theoretical foundation for predictive AI analysis in HR is based on the broader concept of data-driven decision making. This approach is influenced by the increasing availability of vast datasets and the ability of machine learning algorithms to analyse and derive insights from these data (Nyathani, 2023; Jogarao, et al., 2023). The Bayesian Decision Theory, for instance, provides a framework for decision-making under uncertainty, aligning with the predictive nature of AI analysis (Brian T, 2020). By incorporating historical data, probabilities, and predictive modelling, HR professionals can make informed decisions about talent acquisition, workforce planning, and performance management (Gayathri & Bella, 2023).

Thus, this theoretical foundation for predictive AI analysis in HR may be analysed as depending significantly upon the objective and empirical analysis that AI systems allow on available datasets, which allow HR teams to predict future trends and possibilities to better decide on their strategies. Using the AI tools, the HR teams can assess the employee-related factors, including their performance, retention levels, challenges, or needs for training, and by the assessments of these factors in combination, the HR managers can be understood as being capable of generating key insights that can help with future HR interventions (Nyathani, 2023; Jogarao, et al., 2023).The Bayesian Decision Theory, which has been reviewed here, can be analysed as having key implications in this regard, as the theory clearly offers a platform for conducting a systematic process for making decisions by the HR teams in an organisation based on the possibilities and challenges that are assessed through data analysis.

By combining the AI systems in place, it may be understood that it becomes possible to assess the possibilities and, hence, to make more informed and improved decisions. Thus, it may be noted here that this particular theory offers foundational support for the integration of predictive AI analytics in HR processes so that HR teams can make more effective decisions while developing improved employee strategies (Gayathri & Bella, 2023; Brian T, 2020).

- **Organisational Learning Theories:**

Organisational learning theories, such as the Single and Double Loop Learning models proposed by Chris Argyris and Donald Schon, contribute to the understanding of how organisations can adapt and improve through continuous learning (Kantamara & Ractham, 2014). Predictive AI analysis in HR aligns with these theories by facilitating a continuous feedback loop. As organisations gather data on HR practices and outcomes, AI algorithms learn from these experiences, enabling HR professionals to adapt and refine their strategies. This iterative learning process enhances the effectiveness of HR practices over time (Ouyang, et al., 2023).

These learning theories, therefore, may be realised as reflecting on how organisations can adapt to changes, and make improvements over time. Considering the application of these two theories, it can imply that key developments in an organisation are achievable based on reflection, feedback, and continuous improvements in organisational strategies and functions. Thus, in the context of predictive analytics in HR, it may be analysed that, application of these learning theories can lead to enhanced effectiveness of workforce planning and development as may be considered by HR teams (Kantamara & Ractham, 2014; Ouyang, et al., 2023).

It needs to be mentioned here that such developments can be possible with the data analytics capability of AI systems, and the way AI can guide HR teams to assess their employee strategy requirements based on skills gaps, and organisational requirements. Moreover, with these learning theories, it may also be assessed that the HR functions of an organisation may become more capable of developing as they become more flexible and responsive, particularly with the key advantages that the teams can leverage upon using the AI systems.

- **Resource-Based View (RBV) of HR:**

The Resource-Based View (RBV) of HR emphasises the strategic value of human capital as a source of sustained competitive advantage. This theory suggests that organisations can achieve a competitive edge by leveraging unique and valuable

resources (Gerhart & Feng, 2021). Predictive AI analysis in HR aligns with the RBV by treating human capital as a valuable resource that can be optimised through data-driven insights (Ristyawan, 2020). The ability of AI to predict talent needs, identify high-potential employees, and enhance workforce planning contributes to the strategic management of human resources (Mikalef, et al., 2023).

Thus, considering this particular theory and its application in HR in alignment with AI systems, it may be realised that the HR teams have a key role to play in the identification, acquisition, and cultivation of talents for their organisation so that the strategic objectives of the business can be accomplished. When the same is reflected in alignment with the AI systems, it is understood that the theory highlights the role of technological advances in the management of HR in an organisation This may be realised as the AI systems offer HR teams with technological advances and mechanisms to improve upon their services and decisions (Gerhart & Feng, 2021; Mikalef, et al., 2023).

Thus, when AI is integrated, it may be noted here that, deeper insights may be gained into the human capital and their performance in an organisation, and then the HR teams can work on developing further strategies that can maximise the potential of the available human resources, towards attaining higher competitive advantages for the business. The RBV in this case is further highlighted as the AI systems have the potential to leverage technological advances to make effective choices for employee recruitment while assessing their skills effectively, which in turn can be said to be aligned with the goals and objectives of an organisation (Gerhart & Feng, 2021).

- **Goal-Setting Theory:**

Goal-setting theory, as proposed by Edwin Locke and Gary Latham, emphasises the importance of setting specific and challenging goals to enhance motivation and performance (Lunenburg, 2011). KPIs in HR function as measurable indicators of progress towards organisational objectives, aligning with the principles of goal-setting theory. The establishment of KPIs enables HR professionals to set clear expectations, track performance, and evaluate the effectiveness of HR strategies (Avci, 2015).

Predictive AI analysis further complements this by providing insights into how to adjust goals based on predictive trends and future workforce needs (Gkizani & Galanakis, 2022; Kakulapati, et al., 2020).

Reviewing this theory can be said to have key implications for this research, as the theory suggests that, lacking specific goals can impact HR performance and decisions significantly. Here, the role of predictive AI in HR can be said to be implying how it can enhance the effectiveness of setting the goals as AI systems can provide with significant analysis and insights on the capabilities of organisational employees, trends in their performance, and their potential based on their strengths and weaknesses. By reflecting on such patterns, therefore, it can be possible for HR teams to effectively set their goals while also being able to assess the specific workforce needs of the future (Gkizani & Galanakis, 2022; Kakulapati, et al., 2020; Avci, 2015).

- **Social Exchange Theory:**

Social exchange theory, having its basis in social psychology, emphasises the mutual benefits of social relationships (Ahmad, et al., 2023). In the context of HR, the relationship between employees and the organisation can be analysed through the lens of social exchange theory (Wikhamn & Hall, 2012). KPIs serve as a measure of the reciprocal relationship, indicating the value exchanged between the employee and the organisation (Gabcanova, 2012). Predictive AI analysis enhances this relationship by providing insights into employee preferences, engagement drivers, and factors influencing the social exchange dynamic (Luhana, et al., 2023).

Thus, here it may be analysed that when AI systems are integrated into HR processes, the integration can support the social exchange theory, as with the AI systems, it becomes possible for the HR teams to offer more responsible and personalised support to their employees. This may also be understood as having the potential to contribute towards more reciprocation between the HR teams and employees, thereby influencing the relationship between the employee and organisation more positively.

It may also be realised that such support from the AI systems in HR, considering the social exchange theory, may be reflected through the objective feedback and analysis that the AI systems are able to provide on employee data, thus allowing the HR teams to take necessary actions accordingly (Gabcanova, 2012; Wikhamn & Hall, 2012; Luhana, et al., 2023).

2.3 Predictive AI Analysis in HR

2.3.1 Definition and Evolution of Predictive AI Analysis

At its core, Predictive AI Analysis involves the application of machine learning algorithms to analyse historical data and uncover patterns that can be used to predict future outcomes (Rustagi & Goel, 2022; How, et al., 2020). This process includes key steps of data collection, data preprocessing, selection of features, validation, and testing (Aldoseri, et al., 2023; Gandomi, et al., 2023; Maharana, et al., 2022; Fan, et al., 2021; Qiao, et al., 2022; Sarker & Rahman, 2020; Maleki, et al., 2020). Predictive AI Analysis finds application across various domains, including finance (predicting stock prices), marketing (customer behaviour prediction), healthcare (disease prognosis), and, as relevant to the current context, HR (predicting employee turnover, performance, etc.) (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020).

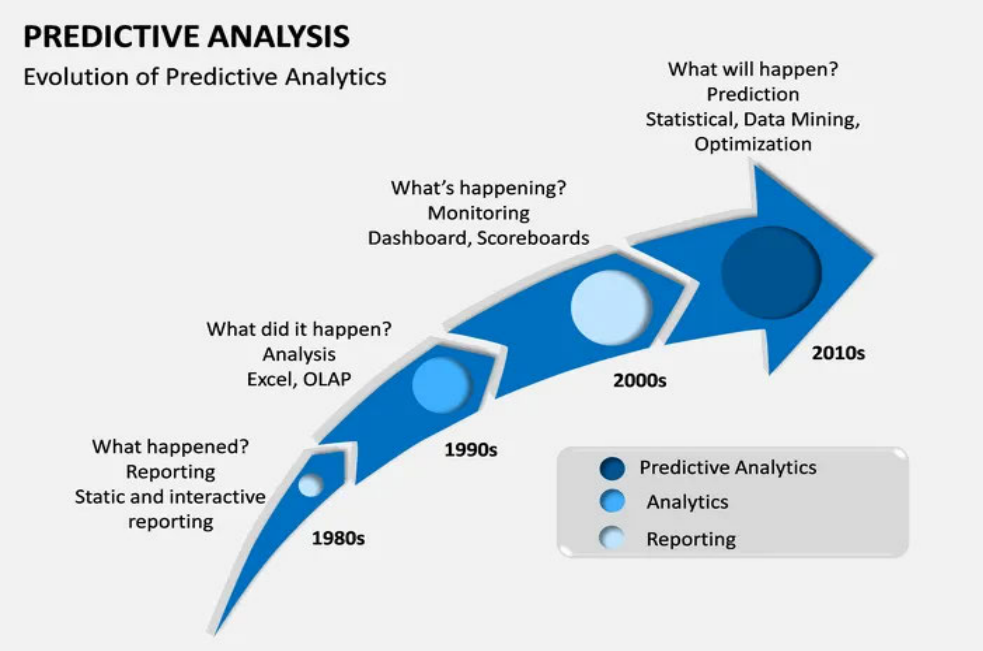
Predictive AI models are used in finance to manage organisational and operational risks, to help businesses to avail investment opportunities, and to forecast market trends. This, in turn, helps financial organisations to make informed decisions and maximise their portfolio performances. The models can also anticipate market changes and enable modifications of strategy based on analysis of past data, market indicators, and information collected from different sources, including the social media. Predictive AI is revolutionising patient care in the healthcare industry by enabling early detection of diseases, individualised treatment options, thus, customising services, and effective management of available resources (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020).

Machine learning algorithms are capable of evaluating the patient data to forecast the initiation of any disease, suggest courses of treatment, and enhance the overall patient outcomes.

Predictive AI also improves consumer experiences in retail by forecasting demand, anticipating customer preferences, and optimising the methods of pricing. In HR, predictive AI analysis enables streamlining the various HR activities, while helping the teams to effectively assess and select potential candidates, to plan for their training and development, as well as retention, and to guide the HR managers to have proactive strategies in place (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020).

The evolution of Predictive AI Analysis is closely related to the broader evolution of AI and analytics. There are several stages of the evolution. In the early stages of AI and analytics, the focus was primarily on descriptive analytics. This involved summarizing and interpreting historical data to provide insights into what happened in the past. While descriptive analytics is valuable for understanding past trends, it lacks the ability to anticipate future events (Davenport, 2018; How, et al., 2020). The advent of predictive analytics marked a significant advancement. Predictive analytics employed statistical methods to identify patterns in historical data and make predictions about future outcomes. This phase laid the groundwork for the integration of AI into predictive analytics (Raghupathi & Raghupathi, 2021). With the rise of machine learning algorithms, especially during the last decade, predictive analytics evolved into Predictive AI Analysis. Machine learning techniques such as regression, decision trees, and neural networks, became integral to the process, allowing more sophisticated modelling and accurate predictions (Sghir, et al., 2023).

Figure (2- 4): Predictive AI Analytics Evolution



Sources: developed by Alcouffe, (2020)

The evolution of computing power and the availability of big data enabled more extensive and complex analyses. Predictive AI Analysis became capable of handling vast datasets with diverse variables, further improving the accuracy and robustness of predictions (Sghir, et al., 2023). More recent advancements in AI have enabled real-time predictions. Instead of relying solely on historical data, Predictive AI models can continuously learn and adapt to new information, providing organisations with up-to-the-minute insights. Predictive AI Analysis has expanded its applications across various fields, contributing to decision-making processes in finance, healthcare, marketing, and, prominently, HR. The ability to predict employee turnover, identify high-potential candidates, and optimise workforce planning has revolutionised the HR practices (Lalitha, 2019; Kakulapati, et al., 2020; Mohammed, 2019).

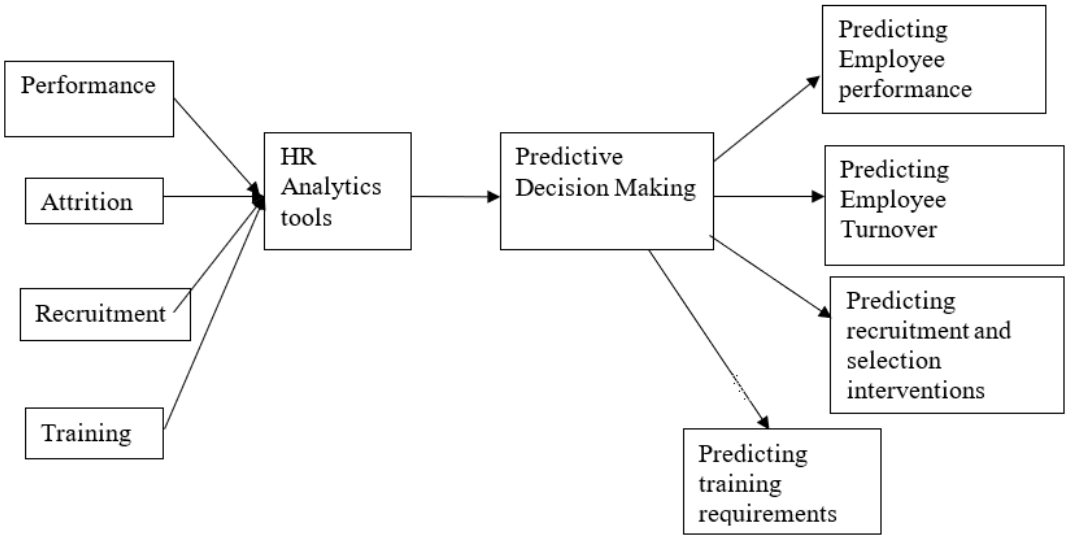
2.3.2 Applications of Predictive AI in HR

Predictive AI plays a key role in streamlining and enhancing the talent acquisition process. By analysing historical hiring data, machine learning models can identify patterns associated with successful hires, enabling HR professionals to make more informed decisions during the candidate screening and selection phases.

These models can predict the likelihood of success of a candidate based on their skills, experience, and cultural fit, thereby optimising the recruitment process and reducing time-to-fill positions (Mohture, 2023; Albassam, 2023). One of the critical challenges in HR is managing employee turnover. Predictive AI models can analyse various factors contributing to turnover, such as job satisfaction, work-life balance, and career development opportunities. By identifying early indicators of potential turnover, HR departments can proactively implement retention strategies, engage with at-risk employees, and create a more favourable work environment, ultimately mitigating turnover and preserving organisational knowledge (Rohit & Ajit, 2016; Li & Fox, 2023).

Predictive AI is utilised to forecast employee performance based on historical data, individual achievements, and ongoing professional development (Gryncewicz, et al., 2023). By analysing patterns and correlations, HR can identify factors that positively impact performance, helping to create personalised development plans and interventions. This application ensures that employees receive targeted support, training, and resources to enhance their productivity and contribution to organisational goals (Shaikh, et al., 2023). AI-driven predictive analytics assists in designing and optimising learning and development programs as well. By analysing employee skill gaps, learning preferences, and performance data, HR can customise training modules to align with individual needs and organisational goals (Sghir, et al., 2023). This not only enhances the effectiveness of learning initiatives but also contributes to a culture of continuous skill development, ensuring that employees are equipped with the competencies needed for evolving job roles (Sghir, et al., 2023; Ouyang, et al., 2023).

Figure (2- 5): Predictive AI in HR



Sources: developed by Abdul & Mohammed, (2019)

Predictive AI also aids HR in strategic workforce planning by forecasting future talent needs and identifying potential gaps in critical roles (Momin & Mishra, 2015). Succession planning is enhanced through the identification of high-potential employees and the development of talent pipelines (Kanojia, et al., 2020). By anticipating changes in workforce demographics and skill requirements, organisations can proactively address talent shortages, ensuring a smooth transition in key positions and maintaining business continuity (Momin & Mishra, 2015). Understanding and predicting employee engagement and satisfaction are crucial for maintaining a positive workplace environment. Predictive AI analyses factors such as employee feedback, sentiment analysis, and engagement survey data to predict trends and potential issues (Syed, et al., 2023). HR can then intervene with targeted initiatives to address concerns, enhance workplace satisfaction, and boost overall employee engagement. Predictive AI also contributes to diversity and inclusion efforts by identifying potential biases in HR processes (Syed, et al., 2023; Mohammed, 2019; Diaz, et al., 2023).

By analysing historical data, AI models can highlight areas where diversity and inclusion initiatives may be falling short, enabling HR to implement corrective measures (Shams, et al., 2023). Additionally, AI can assist in predicting the impact of

diversity initiatives on organisational culture and workforce dynamics. AI can also assist in optimising compensation and benefits structures by analysing market trends, industry benchmarks, and individual employee performance.

Predictive models can forecast the potential impact of different compensation strategies on employee retention, ensuring that organisations remain competitive in attracting and retaining top talent (Shams, et al., 2023; Cachat-Rosset & Klarsfeld, 2023).

2.3.3 Critiques and Challenges in Implementing Predictive AI in HR

While the integration of Predictive AI in HR offers numerous benefits, it is not without its critiques and challenges. One of the primary critiques revolves around the potential biases embedded in predictive AI models. If historical data used to train these models contain biases, the algorithms may continue with or even intensify those biases (Varsha, 2023; Navarro, et al., 2021). For instance, if past hiring decisions were influenced by gender or ethnicity, the AI model might inadvertently replicate these biases, leading to unfair and discriminatory outcomes. HR professionals therefore need to be vigilant in addressing bias during the model development and deployment stages.

The inherent complexity of AI algorithms often results in a lack of transparency. The lack of transparency can hinder the ability of HR professionals to explain decisions to employees, leading to potential distrust and resistance. Striking a balance between complexities of AI algorithms and transparency becomes crucial in maintaining the trust of the employees (Johnk, et al., 2021; Felzmann, et al., 2019). Moreover, implementing predictive AI in HR requires handling large volumes of employee data. Ensuring the privacy and security of this data is a matter of significant concern. HR departments in this case, need to adhere to robust data protection policies, compliance with privacy regulations, and transparent communication with employees about how their data is being used (Budhwar, et al., 2023).

The introduction of predictive AI may also face resistance from employees who may be skeptical about the fairness and accuracy of algorithmic decisions. Lack of trust in the technology and concerns about job security may lead to increased employee

resistance (Mirbabaie, et al., 2022; Li, et al., 2023). Thus, HR professionals need to proactively communicate the benefits of predictive AI, address concerns, and involve employees in the process to build trust and have a positive perception of these technologies.

The ethical implications of relying on algorithms to make HR decisions, such as hiring, promotions, and performance evaluations, need careful consideration. The challenge lies in balancing the objectivity of algorithms with the human touch required for fair and empathetic decision-making. Predictive AI models heavily depend on historical data for training. However, relying solely on past data may not consider factors related to sudden changes, disruptions, or evolving organisational dynamics (Leicht-Deobald, et al., 2019; Rodgers, et al., 2023). Thus, HR professionals need to be aware of the limitations of historical data and ensure that the models can adapt to new circumstances to avoid making decisions based on outdated information.

The implementation of predictive AI in HR introduces a need for new skill sets among HR professionals. Many HR teams may lack the technical expertise required to develop, deploy, and interpret AI models. Bridging this skill gap and providing adequate training become crucial to ensure that HR professionals can effectively leverage predictive AI for strategic decision-making (Patel, 2023; Jaiswal, et al., 2021). The use of predictive AI in HR is also subject to various legal and regulatory frameworks, including anti-discrimination laws, privacy regulations, and employment laws. Ensuring compliance with these regulations while leveraging AI for HR activities leads to a challenge. HR departments need to work closely with legal teams to navigate complex compliance issues (Bujold, et al., 2023; Palos-Sanchez, et al., 2022).

2.3.4 Current Academic Debates on the Role of Predictive AI in HR

The role of Predictive AI in HR has been a subject of ongoing academic debates, reflecting the dynamic nature of technology and its impact on the workplace. One key debate revolves around the ethical implications of using predictive AI in HR. Scholars and practitioners discuss concerns related to biases present in training data, algorithmic decision-making, and potential discrimination (Gupta & Mishra, 2022). Ensuring

fairness, transparency, and accountability in AI models is a critical focus of these discussions. The challenge lies in developing and implementing AI systems that are ethically sound and aligned with principles of diversity and inclusion (Bankins & Formosa, 2023; Rodgers, et al., 2023).

The lack of transparency in AI algorithms, often referred to as the "black box" problem, is also a subject of academic debate (Brozek, et al., 2023). Researchers discuss the need for explanations in predictive HR AI systems. Understanding how these algorithms arrive at decisions is crucial for building trust among employees and stakeholders. A challenge exists in the lack of a balance between the complexity of the AI model and how the AI decisions are made (Larsson & Heintz, 2020). Academic discussions focus on the impact of predictive AI on the overall employee experience. Questions arise regarding how AI-driven decisions in areas such as recruitment, performance evaluation, and promotions affect employee morale, engagement, and job satisfaction. Understanding the psychological and behavioural aspects of employees interacting with AI systems is an evolving area of research (Murugesan, et al., 2023; Luhana, et al., 2023; Rajeshwari, et al., 2023).

Further, scholars are found to explore the adaptability of predictive AI models to diverse organisational contexts. The effectiveness of these models may vary based on industry, company size, and organisational culture. Researchers discuss the need for customisation and refinement to ensure that AI solutions align with the unique requirements and values of different organisations (Perifanis & Kitsios, 2023). The integration of predictive AI raises questions about the skill requirements for HR professionals as well (Soori, et al., 2023; Dwivedi, et al., 2023). Academic discussions focus on the evolving role of HR practitioners, emphasising the need for a blend of domain expertise and technical proficiency. Debates center around the type of skills and training necessary for HR professionals to effectively leverage and oversee AI systems in HR management (Ahmed, 2018; Vrontis, et al., 2021).

The legal and regulatory aspects of using predictive AI in HR are subject to academic analysis as well. Scholars examine the existing legal frameworks, such as data protection and anti-discrimination laws, to assess their adequacy in governing AI applications in HR. Ongoing discussions explore the need for specific regulations

customised to address the unique challenges posed by AI-driven HR practices (Franca, et al., 2023; Hunkenschroer & Kriebitz, 2023). Moreover, the collection and analysis of vast amounts of employee data for predictive AI applications raise privacy concerns. Academics engage in debates about the boundaries of data collection, storage, and usage in HR.

The balance between extracting valuable insights from employee data and respecting individual privacy rights is a key point of discussion (Zhou, et al., 2023; Ebert, et al., 2021). The extent to which predictive AI influences HR decision-making processes is another topic of academic inquiry. Scholars explore how AI insights complement or challenge traditional HR decision-making, emphasising the importance of human judgment in combination with AI-driven recommendations (Gayathri & Bella, 2023; Saklani & Khurana, 2023).

2.4 Key Performance Indicators (KPIs) in HR

2.4.1 Conceptualization and Significance of KPIs in HR

KPIs in HR are conceptualized as indicators that align with broader organisational goals. They translate organisational objectives into measurable outcomes related to workforce performance, employee engagement, talent acquisition, and other HR functions (Gabcanova, 2012). The conceptualisation involves a strategic understanding of how HR contributes to achieving the overall mission and vision of the organisation. KPIs are inherently quantifiable, providing a numerical measure of performance (Aparanji, 2023). KPIs benefit HRM by allowing the HR managers to better evaluate the various functions in HR, which in turn helps the managers to improve the HR strategies aligning with the goals of their organisation (Gabcanova, 2012).

Thus, it may be noted here that KPIs help the HR functions to stay aligned with the overall business goals, wherein the HR managers are also supported by the quantitative measures and assessments provided by the KPIs, to guide more informed and effective decisions. KPIs in HR also help to improve the engagement levels of

organisational employees by enabling assessment of the effectiveness of various employee related initiatives, including training and development. Also, by evaluating the hiring processes, KPIs further benefit HR in effective recruitment of talents for a company. Moreover, such KPIs allow an organisation to assess its performance against benchmarks and hence to make improvements as necessary (Gabcanova, 2012; Aparanji, 2023).

Different HR functions have distinct KPIs tailored to their specific objectives. For example, in recruitment, KPIs may include time-to-hire, cost-per-hire, and candidate satisfaction. In employee engagement, KPIs could include metrics like employee satisfaction scores, retention rates, and productivity levels (Prasad, et al., 2019). The conceptualisation of HR KPIs considers the unique goals and challenges within each HR domain. The conceptualisation emphasises the role of these metrics in driving continuous improvement. KPIs serve as diagnostic tools, allowing HR professionals to identify areas of strength and weakness. The iterative nature of KPIs enables HR teams to refine strategies, implement targeted interventions, and enhance overall HR effectiveness (Asih, et al., 2020; Dutta & Vedak, 2023).

KPIs play a crucial role in strategic decision-making within HR. By providing quantitative insights, KPIs empower HR leaders to make informed decisions about resource allocation, talent management strategies, and organisational development initiatives. The significance lies in aligning HR activities with strategic priorities to drive organisational success (Setiawan & Purba, 2020). KPIs serve as a measure for evaluating HR performance and accountability. They provide a basis for assessing the impact of HR initiatives on organisational outcomes. Whether it is measuring the success of training programs or the effectiveness of diversity and inclusion efforts, KPIs establish clear benchmarks against which HR professionals can be held accountable (Setiawan & Purba, 2020; Ulhaq & Febriansyah, 2023).

KPIs contribute to employee and organisational development by identifying areas for improvement (Gabcanova, 2012). For instance, KPIs related to employee training and development can highlight skill gaps, enabling HR to design targeted learning programs. The significance lies in supporting a culture of continuous learning and development that benefits both individuals and the organisation. HR KPIs related

to employee satisfaction, engagement, and well-being are instrumental in understanding and improving the employee experience (Ulhaq & Febriansyah, 2023; Samuvel & Gilsha, 2023). The significance of these KPIs lies in creating a positive work environment, addressing issues that impact morale, and ultimately allowing a more engaged and productive workforce (Bhatti, et al., 2014).

Here, it may be noted that the KPIs in HR have the potential to identify and nurture leaders of the future, which can be said to be applicable in the case of the UAE organisations as well. This is possible when clear KPIs are established by an organisation and its HR which help to effectively evaluate the performance of employees. With strong KPI frameworks being in place, it is possible for an organisation to identify potential candidates having the necessary talents and skills as desired in an organisation and which can turn them into strong and positive leaders in the future. Also, KPIs allow enhanced transparency and accountability in the process of talent acquisition and talent development in an organisation (Bhatti, et al., 2014; Ulhaq & Febriansyah, 2023).

KPIs assist in optimising HR resources by identifying areas where interventions can yield the greatest impact. This includes efficient talent acquisition processes, streamlined onboarding, and targeted retention strategies. The significance of KPIs lies in enabling HR to allocate resources effectively to meet organisational goals (Gabcanova, 2012). HR KPIs facilitate benchmarking against industry standards and best practices as well. This significance allows organisations to assess their HR performance relative to peers, identify areas of competitive advantage, and implement strategies to stay ahead in talent management and HR practices (Gabcanova, 2012; Ulhaq & Febriansyah, 2023).

2.4.2 AI-measured KPIs

AI-measured KPIs leverage advanced analytics and machine learning algorithms to process vast amounts of data rapidly. This data-driven approach allows for real-time insights and a more comprehensive analysis of various factors influencing HR metrics. The AI-measured KPIs excel in predictive analytics, going beyond historical

summaries to forecast future trends. Machine learning algorithms can identify patterns, correlations, and potential outcomes, empowering HR professionals to make data-driven decisions that anticipate future workforce needs (Sheshadri & Palivela, 2023; Prakash, 2019).

Such KPIs are focused on objectivity by reducing the impact of human biases in decision-making processes.

Algorithms assess data impartially, leading to more objective evaluations of employee performance, potential risks, and talent acquisition strategies (Aparanji, 2023). The AI-measured KPIs have the capability to continuously learn and adapt. As new data becomes available, machine learning models can update and refine their predictions, ensuring that HR strategies remain aligned with the dynamic nature of the workforce and organisational goals (Sheshadri & Palivela, 2023; Mikalef & Gupta, 2021).

AI allows for a higher degree of personalization and customisation in KPIs. Metrics can be tailored to specific organisational objectives, reflecting the unique goals and challenges of each organisation. This flexibility enables HR to focus on the metrics most relevant to their strategic priorities (Dias, et al., 2023). AI also streamlines the process of data collection, analysis, and reporting. This efficiency allows HR professionals to devote more time to strategic initiatives and decision-making rather than manual data processing. Moreover, automation contributes to a more agile and responsive HR function (Sheshadri & Palivela, 2023; Aparanji, 2023).

2.4.3 Literature on the Effectiveness of KPIs in HR

The literature on the effectiveness of KPIs in HR highlights the key role that these metrics play in shaping organisational success, talent management, and strategic decision-making. Numerous studies emphasise the importance of aligning HR KPIs with organisational strategy. The effectiveness of KPIs in HR is dependent upon their direct connection to key business goals. When KPIs are strategically aligned, HR professionals can measure and demonstrate their contribution to the achievement of

organisational objectives, supporting a more strategic role for HR within the overall business framework (Gabcanova, 2012; Maroof, 2022; Mtau & Rahul, 2024).

Research consistently highlights the effectiveness of KPIs in performance management and improving employee productivity. Clear and measurable KPIs in areas such as goal attainment, individual performance, and team achievements provide a framework for assessing and enhancing employee contributions (Neher & Maley, 2019). Effective performance management, facilitated by well-designed KPIs, contributes to organisational success by ensuring that individual and team efforts align with broader objectives (Aparanji, 2023).

The literature also highlights the critical role of KPIs in talent acquisition and retention strategies. Metrics such as time-to-fill vacancies, cost-per-hire, and turnover rates are significant in evaluating the efficiency and effectiveness of recruitment processes. KPIs in retention, such as employee satisfaction scores and turnover trends, help organisations to identify areas for improvement and implement targeted interventions to retain top talent (Ulhaq & Febriansyah, 2023; Soubjaki, 2016). Studies consistently demonstrate a positive correlation between the use of KPIs and employee engagement and satisfaction. KPIs related to employee experience, feedback mechanisms, and workplace well-being contribute to a deeper understanding of organisational dynamics. HR professionals can leverage these insights to implement initiatives that enhance employee engagement, leading to increased job satisfaction and improved overall organisational performance (Aparanji, 2023; Lepold, et al., 2018). The effectiveness of KPIs in evaluating the impact of learning and development initiatives is a focal point in HR literature. Metrics such as training completion rates, skill acquisition, and performance improvements linked to learning programs provide valuable insights.

Organisations use these KPIs to assess the return on investment in training and development, ensuring that learning initiatives align with strategic goals and contribute to skill development (Soubjaki, 2016; Aparanji, 2023). Furthermore, KPIs play a crucial role in assessing the cost efficiency of HR processes. Metrics related to HR operational costs, budget adherence, and resource utilisation contribute to effective resource management (JETIR, 2019). Organisations can identify areas of inefficiency,

optimise processes, and allocate resources strategically based on the insights provided by KPIs.

The literature also acknowledges the role of KPIs in enhancing organisational agility. Dynamic KPIs that adapt to changing business environments and workforce dynamics contribute to a more agile HR function (Jayanthi, 2018; Taj, 2023). A recurring theme in HR literature is the concept of continuous improvement facilitated by KPIs. Organisations that view KPIs as tools for ongoing assessment and refinement of HR strategies are better positioned for success. KPIs provide a feedback loop, enabling HR professionals to identify areas for improvement, adjust strategies, and continually enhance their effectiveness in supporting organisational goals (Aparanji, 2023).

2.5 Integration of Predictive AI Analysis and KPIs

2.5.1 Models and Frameworks for Integrating Predictive AI with KPIs

Integrating Predictive AI with KPIs in HR is a progressive approach that leverages advanced analytics and machine learning to enhance decision-making, optimise workforce management, and align HR strategies with organisational goals (Saxena, 2020; Kakulapati, et al., 2020; Malisetty, et al., 2017). Several existing models and frameworks offer guidance on how organisations can effectively combine predictive AI with KPIs in HR. Some of the prominent models and frameworks have been reviewed here.

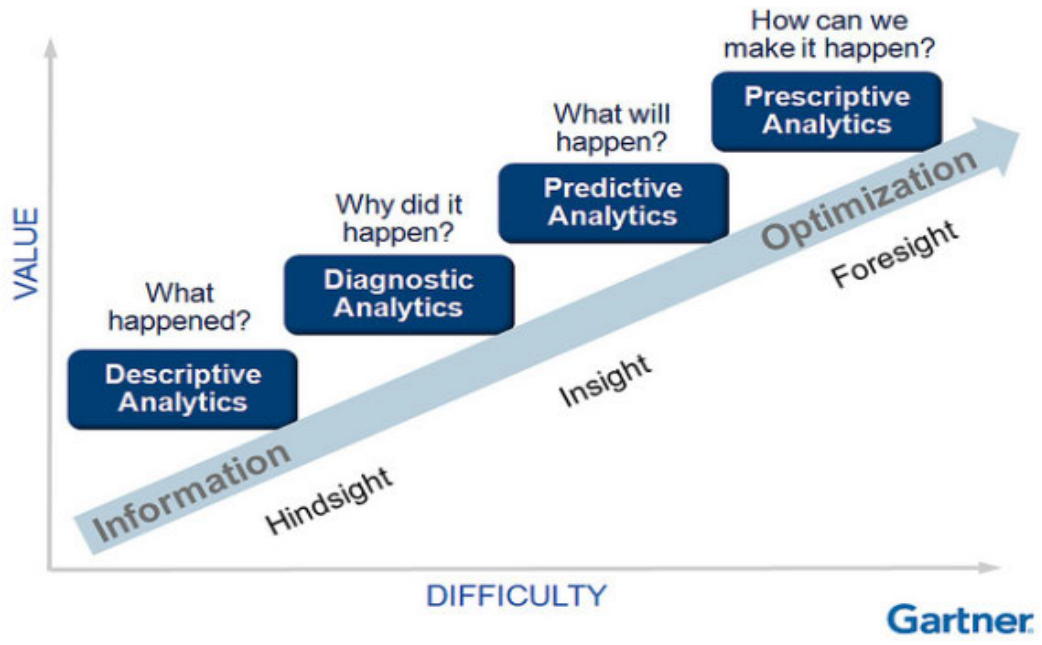
- **HR Analytics Maturity Model:**

The HR Analytics Maturity Model, often used as a foundation for integrating predictive AI with KPIs, outlines the stages of maturity in analytical capabilities of an organisation. It typically has four levels – descriptive analytics, diagnostic analytics, predictive analytics, and prescriptive analytics (Krol & Zdonek, 2020; Prabhakar, et al., 2021; Kale, et al., 2022). At the basic level (descriptive), organisations use historical

data to understand what happened in the past. Moving to the next stage (diagnostic), organisations analyse data to identify why certain events occurred, allowing for a deeper understanding of patterns and correlations (Kale, et al., 2022).

The third stage (predictive) involves using advanced analytics, including predictive AI, to forecast future trends and outcomes based on historical data (Prabhakar, et al., 2021; Alvarez-Gutierrez, et al., 2022; Kale, et al., 2022). The highest level (prescriptive) involves recommending actions based on the insights generated by predictive analytics. This stage is proactive, guiding decision-makers on the best course of action. Integrating predictive AI with KPIs is particularly emphasised in the predictive analytics stage, where machine learning algorithms can forecast future workforce trends and enable proactive decision-making aligned with KPIs (Prabhakar, et al., 2021; Alvarez-Gutierrez, et al., 2022; Kale, et al., 2022).

Figure (2- 6): HR Analytics Maturity Model



Sources: developed by Ambalavanan, (2017)

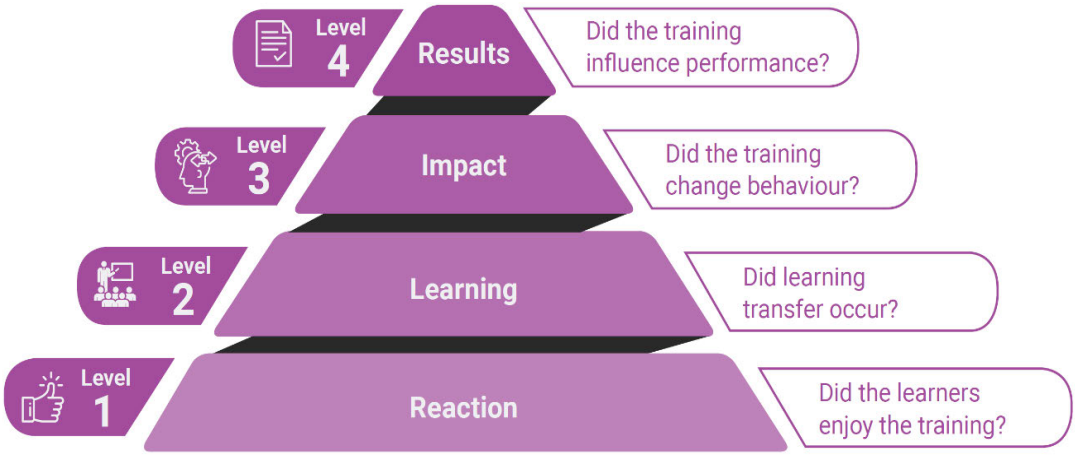
Here, considering this model, it may be realised that this model particularly offers a roadmap for organisations to effectively evaluate their HR capabilities and analytics. The stages that have been reviewed here reflect on how this model can guide the organisational HR processes to conduct descriptive analysis on HR data, and with organisation progressing with the maturity model, the predictive AI analytics can be used to forecast on the future possibilities and/or challenges (Krol & Zdonek, 2020; Prabhakar, et al., 2021; Kale, et al., 2022). The role of the predictive analytics in HR here is also understood as leveraging on the models that are driven by AI, towards enhancing the overall accuracy levels and HR metrics for the organisation. In this process, the organisational HR can also shift towards a more proactive approach to its decision making, as guided by this model (Prabhakar, et al., 2021; Alvarez-Gutierrez, et al., 2022; Kale, et al., 2022).

- **Kirkpatrick Model for Training Evaluation:**

While originally designed for training evaluation, the Kirkpatrick Model is adaptable for assessing the impact of learning and development initiatives using KPIs. The model consists of four levels – reaction, learning, behaviour, and results (Alsalamah & Callinan, 2021).

Reaction involves gauging immediate reactions of participants to training. The stage of learning involves assessing the knowledge and skills acquired during training. The next stage (behaviour) evaluates the changes in behaviour or performance on the job. The next level (results) measures the impact of training on organisational outcomes. By incorporating predictive AI, organisations can enhance this model, especially in the results stage, by forecasting the potential impact of training on KPIs such as productivity, employee engagement, or turnover rates (Alsalamah & Callinan, 2021; Cahapay, 2021).

Figure (2- 7): Kirkpatrick Model for Training Evaluation



Sources: developed by Bretz, (2018).

Reviewing on this model, it can be analysed that, by integrating predictive AI with KPIs within the Kirkpatrick Model, it is possible to enhance the process of evaluation based on the predictive insights that can be obtained through the AI analytics, upon the effectiveness of HR strategies and decisions. Here, it may be noted that based on the AI driven analytics, it may be possible for the HR to better optimise their training programs, while measuring the impacts of their actions on the business goals and objectives, towards achieving continuous improvement in employee performance (Alsalamah & Callinan, 2021; Cahapay, 2021). Thus, with this model, it is possible to assess the effectiveness of the HR training interventions, wherein the AI integration can offer key insights to further advance the analysis and decision making based on the training analysis.

- **Balanced Scorecard:**

The Balanced Scorecard is a comprehensive strategic framework that includes financial and non-financial KPIs to evaluate the performance of an organisation. It consists of four perspectives: financial, customer, internal process, and learning and growth (Gupta & Sharma, 2017; Utomo, et al., 2019). The financial perspective is focused on financial performance indicators. The customer perspective is involved in

assessing customer satisfaction and market performance. The internal process perspective work by evaluating the efficiency and effectiveness of internal processes, and the learning and growth perspective involves measuring the organisation's capacity for innovation and improvement. Integrating predictive AI into the Balanced Scorecard allows organisations to enhance the predictive capabilities of KPIs, providing insights into future financial performance, customer trends, and internal process optimisation (Utomo, et al., 2019; Kumari, 2011).

- **Gartner's Analytics Ascendancy Model:**

Gartner's Analytics Ascendancy Model outlines the progression of analytics maturity within organisations. It categorizes analytics capabilities into four stages – descriptive, diagnostic, predictive, and prescriptive (Groggert, et al., 2018). The first stage (descriptive) involves understanding what happened in the past. The second stage (diagnostic) involves analysing why certain events occurred. The third stage (predictive) involves forecasting future trends and outcomes, and the fourth stage (prescriptive) recommends actions to optimise outcomes. This model aligns with the HR Analytics Maturity Model and emphasises the importance of predictive analytics in shaping the future of HR practices. Integrating predictive AI with KPIs is a key component of advancing through these stages (Groggert, et al., 2018; Erikkson, et al., 2020).

This particular model can therefore be realised as offering a structured approach so that an organisation can develop their analytics skills and capabilities, to involve predictive and prescriptive analyses. Here, it may be analysed that if the predictive AI analytics is integrated with the HR processes of an organisation, then, it can enhance the overall ability of the organisation to develop ideas that are actionable in form, and which can also result in key positive outcomes for a business.

Thus, the model implies the shift that an organisation can experience through AI integrated HR processes from basic reporting mechanisms towards predictive analytics, while benefitting the overall achievements of a business. This may also be realised as being possible with the key abilities of AI to deal with vast amounts of data, and allow

HR to make more informed and improved decisions (Groggert, et al., 2018; Erikkson, et al., 2020).

- **Workforce Analytics Framework:**

Workforce analytics frameworks, such as the one proposed by Deloitte, provide a structured approach to integrating predictive AI with KPIs in HR. This framework typically includes defining objectives, data foundation, predictive modelling, and continuous improvement (Cho, et al., 2023). Defining objectives involve clearly articulating the organisational objectives and KPIs that will be the focus of predictive analytics efforts. Data foundation establishes a robust data basis, ensuring the availability and quality of relevant data for predictive modelling (Cho, et al., 2023). Predictive modelling works by developing and deploying predictive models using AI algorithms to forecast outcomes related to defined KPIs, and continuous improvement involves implementing a feedback loop for continuous improvement, by refining models based on real-time data and changing organisational needs. This framework emphasises the importance of a well-defined strategy, data readiness, and a continuous improvement cycle for successfully integrating predictive AI with KPIs in HR (Cho, et al., 2023; Reddy & Lakshmikeerthi, 2017).

- **Predictive HR Analytics Framework by Bersin:**

Bersin, a research and advisory firm, provides a predictive HR analytics framework that guides organisations through the process of leveraging predictive analytics for HR success (Tiwari & Nigam, 2023). Key components of the framework include identifying specific business challenges or opportunities that predictive analytics can address, developing a comprehensive data strategy to support predictive analytics initiatives, building and deploying predictive models customised to address the identified business challenges, and evaluating the impact of predictive analytics on HR outcomes and KPIs (Peeters, et al., 2020).

This framework emphasises the need for a targeted approach to predictive analytics, ensuring alignment with specific business objectives and KPIs (Kakulapati, et al., 2020).

2.5.2 Success Stories and Case Studies: AI-Measured KPIs in HR

The integration of AI-measured KPIs into HR practices has been successfully demonstrated by several leading global organisations. These cases highlight how predictive analytics can be applied to improve employee retention, optimise recruitment, personalise learning and development, and enhance performance management. By examining such success stories, valuable insights can be drawn regarding the transformative potential of AI-driven performance metrics in shaping more efficient, data-driven HR strategies.

Table (2- 1): Success Stories

Company	Logo	Success Story
Google	Google	Google, a pioneer in tech innovation, implemented predictive analytics to address employee retention challenges. By leveraging AI-measured KPIs, Google analysed various factors influencing employee turnover, such as job satisfaction, career development, and team dynamics. The predictive analytics model identified patterns and trends, allowing HR professionals to proactively address issues before they led to attrition. This strategic approach contributed to improved employee retention and a more engaged workforce (Shrivastava, et al., 2018).
IBM	IBM	IBM has embraced AI-measured KPIs in its recruitment processes to streamline and optimise talent acquisition. Using predictive analytics, IBM analysed historical data related to successful hires, identifying patterns that correlated with long-term employee success. By incorporating these AI-driven insights into their KPIs, IBM improved the efficiency of its recruitment efforts, reducing time-to-fill positions and enhancing the quality of new hires (IBM, 2021).

Unilever		Unilever, a global consumer goods company, utilised predictive HR analytics to enhance learning and development initiatives. By integrating AI-measured KPIs, Unilever identified personalised learning paths for employees based on their skills, performance, and career aspirations. Predictive analytics played a crucial role in forecasting the impact of these learning interventions on employee performance, thus, contributing to a more skilled and adaptable workforce (Kamble, 2023).
Vodafone		Vodafone, a telecommunications giant, utilised predictive analytics to address high employee turnover. By incorporating AI-measured KPIs, Vodafone identified factors contributing to attrition, such as career progression, job satisfaction, and work-life balance. Predictive models helped Vodafone to proactively implement retention strategies, resulting in a significant reduction in employee turnover and associated costs (Kamble, 2023).
Amazon		Amazon, a leading e-commerce and technology company, embraced AI-measured KPIs to enhance performance management. By leveraging predictive analytics, Amazon gained insights into employee performance trends, enabling a more data-driven approach to talent management. Predictive models provided valuable insights into factors influencing individual and team performance, contributing to a more effective and targeted performance management system (Manasa & Devi, 2022).

Sources: developed by the authors

These global success stories highlight how AI-measured KPIs can transform HR practices by enhancing recruitment, retention, learning, and performance management. While drawn from multinational corporations, the insights are highly relevant to the UAE public sector, where similar challenges—such as employee retention, skill development, and efficient talent management—persist. By adapting these proven approaches to the cultural and institutional context of the UAE, public sector organisations can leverage predictive analytics to optimise HR processes and to support national goals of innovation, efficiency, and sustainable growth.

2.5.3 Challenges and Considerations in Integrating Predictive AI and KPIs

Integrating Predictive AI with KPIs in HR is a transformative endeavor, but it comes with its own set of challenges and considerations. A fundamental challenge lies in the quality and accessibility of data. Predictive AI models heavily rely on vast and accurate datasets (Kumar, et al., 2022). Ensuring the availability of relevant HR data, addressing data storage, and maintaining data quality are critical considerations, as incomplete or inaccurate data can lead to biased models and inaccurate predictions, undermining the effectiveness of AI-measured KPIs (Tambe, et al., 2019).

The use of predictive AI in HR raises concerns about privacy, data security, and potential biases in algorithmic decision-making require careful attention. Organisations require establishing transparent policies, comply with data protection regulations, and address fairness and equity concerns to build trust among employees and stakeholders (Cappelli, et al., 2018). The "black box" nature of some AI algorithms poses challenges in terms of interpretability and explanations. HR professionals and decision-makers may find it challenging to understand how AI arrives at specific predictions (Tambe, et al., 2019).

The accuracy and reliability of predictive models are crucial for their success. Inaccurate predictions can lead to misguided decisions and ineffective HR strategies. Thus, organisations need to continuously monitor and validate the performance of AI models, adapting them to evolving workforce dynamics and ensuring they align with organisational objectives (Bujold, et al., 2023). Integrating predictive AI with KPIs may also face resistance from employees and HR professionals who are accustomed to traditional methods (Tambe, et al., 2019). A cultural shift towards data-driven decision-making requires change management strategies, training programs, and effective communication to overcome resistance and foster a culture that embraces AI-driven insights (Akter, et al., 2023).

Moreover, implementing predictive AI in HR necessitates a workforce equipped with the necessary skills to understand, interpret, and leverage AI-driven insights. Organisations must assess existing skill gaps, provide training programs, and invest in development of HR professionals to maximise the benefits of predictive AI in shaping

and measuring HR performance (Tambe, et al., 2019). There is also a risk of overemphasising technical solutions without considering the broader organisational context. While predictive AI is a powerful tool, it should complement human expertise rather than replace it. Organisations must strike a balance, ensuring that AI solutions align with human judgment, organisational values, and the unique aspects of their workforce (Enholm, et al., 2021).

The implementation of predictive AI in HR involves significant costs, from acquiring advanced analytics tools to investing in data infrastructure and talent. Organisations need to carefully assess the return on investment, allocate resources judiciously, and consider the long-term sustainability of AI-measured KPI initiatives (Murugesan, et al., 2023). AI models may inherit biases present in historical data, potentially leading to biased predictions. Ensuring fairness in AI algorithms is thus, a critical consideration to avoid continuing or aggravating existing biases. Regular audits, ethical AI guidelines, and ongoing monitoring are essential to mitigate bias in predictive AI applications. Furthermore, AI models designed for one organisation or industry may not be directly applicable to another due to variations in organisational culture, industry dynamics, and workforce characteristics (Kumar, et al., 2022; Tambe, et al., 2019).

2.6 HR Activities in UAE Public Sector

2.6.1 Overview of HR Practices in the UAE Public Sector

The HR practices in the UAE public sector are integral to the effective functioning and development of the government institutions. The UAE, known for its dynamic economy and rapid development, places a strong emphasis on cultivating a skilled and motivated public workforce to support its ambitious goals. One of the distinctive features of HR practices in the UAE public sector is the focus on Emiratisation. Emiratisation refers to the nationalisation of the workforce, aiming to increase the participation of UAE citizens in the labour market, particularly in leadership and decision-making roles (Forstenlechner, et al., 2012). Government

entities implement Emiratisation initiatives through targeted recruitment, training, and development programs to empower Emiratis in various sectors. Emiratisation is not just a recruitment strategy; it is a broader national policy aimed at fostering economic sustainability and social consistency in the nation (Sarker & Rahman, 2020).

The UAE government actively encourages private sector collaboration to implement Emiratisation initiatives, promoting the hiring and advancement of UAE nationals in diverse industries. By incentivising private enterprises to participate in Emiratisation, the government ensures a holistic approach to national workforce development, contributing to a more inclusive and diversified economy. This initiative aligns with the broader vision of building a knowledge-based economy, empowering Emiratis to play pivotal roles across sectors and contribute significantly to the development of the country (Forstenlechner, et al., 2012; Sarker & Rahman, 2020).

HR practices in the UAE public sector are aligned with strategic workforce planning to ensure that government institutions have the right talent in the right positions. This involves forecasting future workforce needs, identifying critical skills, and developing recruitment and retention strategies to meet the evolving demands of the public sector. Strategic workforce planning in the UAE public sector goes beyond immediate operational needs. It is a forward-thinking strategy that considers the long-term goals of the nation (Al Awadhi & Muslim, 2023).

The approach involves analysing demographic trends, identifying emerging skills requirements, and anticipating technological shifts. By aligning workforce planning with the broader national agenda, the UAE ensures that its public sector is well-prepared for future challenges and opportunities. Additionally, strategic workforce planning incorporates measures to address potential skill gaps, facilitating proactive talent development initiatives and fostering adaptability in the face of evolving economic environments. This strategic foresight contributes to the resilience and sustainability of the UAE's public sector workforce (Al Awadhi & Muslim, 2023; Fahim, 2018).

Continuous learning and development are key components of HR practices in the UAE public sector. Government entities invest in professional development programs to enhance the skills and capabilities of their workforce. This includes

specialised training, workshops, and partnerships with educational institutions to align competencies of employees with the latest industry trends and best practices (Alharthy & Bin Marni, 2020). Performance management is a fundamental HR practice in the UAE public sector. It involves setting clear performance expectations, conducting regular evaluations, and providing constructive feedback to employees. The aim here is to ensure that individual and team performances align with organisational goals, and to recognise and reward exceptional contributions (Malik, et al., 2018; Al-Raisi, et al., 2011).

Building strong leadership is another key priority in HR practices across the UAE public sector. Leadership development programs focus on identifying and nurturing potential leaders, providing them with the necessary skills and knowledge to consider key roles within government institutions. This strategic approach contributes to the sustainability and continuity of effective leadership in the public sector (Sowmya, et al., 2018; Alhammadi & Romle, 2023). Promoting diversity and inclusion is increasingly becoming a core aspect of HR practices in the UAE public sector. Efforts are made to create a work environment that embraces individuals from diverse backgrounds, including different nationalities and genders. This approach not only reflects the multicultural nature of the UAE but also enhances creativity and innovation within government entities (Chaudhry, et al., 2021; Baycar, 2022).

Here, it may be noted in the context of the UAE that, significant efforts have been made by the country to promote gender equality which has opened up significant opportunities for the women in the country to take up key leadership roles within organisations. The country proactively supports women in their leadership positions ensuring that their talents and capabilities are recognised irrespective of their gender differences. Emirati women can in the current times, be found to take responsibilities across different roles and in different sectors, showcasing the commitment that the country has to support the complete potential of women in the country (Rapanta & Badran, 2016).

HR practices in the UAE public sector are also adapting to the digital era by integrating technology to streamline processes. This includes the implementation of Human Resource Information Systems (HRIS) for efficient data management,

automation of routine tasks, and the utilisation of AI for talent acquisition and predictive analytics (Fenech, et al., 2019; Quaosar & Rahman, 2021). Employee well-being is another major priority in HR practices, reflecting the understanding that satisfied and engaged employees contribute positively to organisational success. Initiatives related to health and wellness, work-life balance, and employee support programs are implemented to enhance the overall well-being and satisfaction of the public sector workforce (Benuyenah & Pandya, 2020; Badri, et al., 2022).

Job classification and compensation systems are designed to ensure fairness and equity in remuneration across the public sector. Government entities implement clear job grading structures, taking into account factors such as responsibilities, qualifications, and experience. Competitive compensation packages are offered to attract and retain top talent (Sudiro, et al., 2021; Al Kassem, et al., 2017; Askary, et al., 2014). Moreover, effective communication and employee engagement initiatives are integral components of the HR practices. Regular communication channels are established to keep employees informed about organisational developments, policies, and opportunities. Employee engagement surveys and feedback mechanisms are employed to gauge the satisfaction levels of the workforce and address any concerns proactively (O'Neill, et al., 2015).

HR practices in the UAE public sector adhere to the labour laws of the country and regulations. This includes ensuring fair labour practices, compliance with employment contracts, and providing a safe and secure working environment. Staying updated with legal requirements is a priority to avoid any legal implications (Al Kassem, et al., 2017). Many government entities in the UAE actively engage in social responsibility and corporate citizenship initiatives. HR practices extend beyond the workplace to contribute to the community, aligning with the broader goals of the UAE's vision for sustainable development and societal well-being (Aarthi & Sahu, 2021).

It may be discussed here that, the rules and regulations stated by the Ministry of Human Resources and Emiratisation (MOHRE) in the UAE offer a significant source of support for the data related to AI training ensuring that they are compliant with the labour laws in the country. By complying with the regulations, training models for

employees can be developed while complying with rules related to the working hours of employees, employee rights, and other moral and ethical obligations required for employees at work. the application of AI in this case can further be realised as enhancing the possibility of assessing specific cases related to employee evaluations and their rights, in the context of the rules and regulations set by the MOHRE (MOHRE, 2024; Kaur, et al., 2023).

Thus, it may be noted that the HR practices in the UAE public sector are dynamic and responsive to the evolving needs of the government and its workforce. The emphasis on Emiratisation, strategic workforce planning, professional development, and embracing technological advancements underlines the commitment to building a capable and sustainable public sector workforce. By prioritising employee well-being, diversity, and effective communication, the UAE public sector strives to create a conducive work environment that aligns with the vision of the country for progress and prosperity.

2.6.2 Unique Challenges and Opportunities in the UAE Context

The UAE presents a distinctive environment for HR management, marked by a dynamic blend of traditional values, rapid modernisation, and a multicultural workforce. Understanding the unique challenges and opportunities in the UAE context is crucial for crafting effective HR strategies that resonate with the country's socio-economic factors. The UAE boasts a diverse workforce with individuals hailing from various cultural backgrounds. Managing a multicultural workforce poses challenges related to communication, understanding cultural factors, and fostering a cohesive organisational culture. HR professionals need to implement strategies that celebrate diversity while promoting unity and inclusion (Kuoribo, et al., 2022). While Emiratisation is a central pillar of HR practices, achieving the right balance between Emirati and expatriate talent presents a challenge. HR must navigate Emiratisation initiatives to ensure that the national workforce is meaningfully integrated while recognising the invaluable contributions of expatriate professionals (Al-Jenaibi, 2012).

The UAE is at the forefront of technological innovation. HR faces the challenge of adapting to rapid technological advancements, including the integration of AI and automation. This necessitates ongoing developmental initiatives and a strategic approach to embracing technology without neglecting the human aspects of HR (Ali, et al., 2023; Li, et al., 2023). Moreover, the fast-paced business environment of the UAE and its emphasis on excellence can create challenges in maintaining a healthy work-life balance. HR needs to prioritise employee well-being, mental health, and work-life harmony to ensure sustained productivity and satisfaction (Parakandi & Behery, 2015; Tahir, 2023).

The UAE's vision for a knowledge-based economy creates opportunities for HR to enhance innovation and support continuous learning (Ahmed & Alfaki, 2013). HR practices can align with the national agenda by promoting a culture of creativity, investing in education and development, and attracting talent that contributes to the transformation of the country into a hub for innovation. The global outlook of the country and its strategic geographical location make it a key attraction for international talent. HR has the opportunity to leverage this cosmopolitan environment by attracting diverse skill sets and supporting a global mindset within organisations.

This international talent pool enhances creativity and brings varied perspectives to problem-solving (Budhwar, et al., 2019; Haak-Saheem, et al., 2017; Alblooshi, 2018).

Furthermore, the multicultural nature of the UAE provides HR with the opportunity to leverage on diversity and inclusion. By creating inclusive policies, celebrating cultural diversity, and ensuring equal opportunities for all, HR can contribute to the development of a harmonious and collaborative work environment. Given the ambitious national goals, HR also has the opportunity to focus on leadership development that aligns with the long-term sustainability objectives of the country (Alblooshi, 2018).

The UAE's commitment to technological advancement creates opportunities for HR to embrace smart technologies for talent management. From advanced analytics for predictive HR to innovative recruitment tools, HR professionals can leverage technology to streamline processes, enhance decision-making, and elevate the overall

employee experience. HR can also connect with educational institutions to bridge the skills gap and ensure a steady supply of talent aligned with industry needs. Collaborative initiatives, such as internship programs and skill development projects, contribute to the development of a workforce equipped for the demands of the UAE's evolving economy (Ali, et al., 2023; Li, et al., 2023).

2.6.3 Existing Literature on HR Innovations in the UAE Public Sector

Emiratisation, which is a unique initiative specific to the UAE, has gathered significant attention in HR literature. Scholars have explored the challenges and successes of Emiratisation, emphasising its role in building a skilled national workforce and supporting economic sustainability. The literature discusses the innovative strategies employed by the public sector to attract, develop, and retain Emirati talent, ensuring their meaningful participation in various roles and levels of responsibility (Sarker & Rahman, 2020; Rutledge & Al Kaabi, 2023).

The literature underlines the integration of technology and HR automation as a key innovation in the UAE public sector. From the implementation of sophisticated HRIS to the use of AI in recruitment processes, scholars explore how technology is streamlining HR operations, reducing manual tasks, and enhancing overall efficiency.

Case studies and analyses demonstrate how these technological innovations contribute to a more agile and data-driven HR function (Fenech, et al., 2019; Quaosar & Rahman, 2021). The UAE public sector places a strong emphasis on leadership development, and existing literature delves into innovative programs designed to nurture and cultivate effective leaders. Studies explore how leadership development initiatives, including mentorship programs and customised training modules, contribute to building a team of leaders capable of navigating the complexities of the modern public sector (Kamali, et al., 2015).

The literature on HR innovations in the UAE public sector emphasises the holistic approach taken towards employee well-being and happiness. Scholars investigate initiatives that go beyond traditional HR practices, including well-being programs, mental health support, and work-life balance policies (AlMunthiri, et al.,

2023). The focus on employee happiness is seen as a strategic innovation contributing to increased productivity, engagement, and overall job satisfaction. The shift towards data-driven decision-making is a prominent theme in the literature on HR innovations in the UAE public sector. Researchers explore how analytics and predictive modelling are being utilised to inform HR strategies, workforce planning, and talent management. The literature highlights the transformation from reactive to proactive HR practices, enabling the public sector to anticipate trends and make informed decisions (Alblooshi, 2018; AlMunthiri, et al., 2023). Innovations in performance management systems have also gathered attention in HR literature. Scholars investigate the adoption of agile performance management approaches, moving away from traditional annual reviews to more continuous feedback mechanisms. This shift is seen as a response to the dynamic nature of the UAE public sector, promoting agility, adaptability, and a focus on continuous improvement (Alblooshi, 2018). Researchers also highlight how knowledge-sharing platforms facilitate continuous learning, knowledge exchange, and skill development. Innovative collaborations between the UAE public sector and academic institutions are also examined in the literature. These collaborations involve joint research projects, internship programs, and academic partnerships aimed at aligning education with the evolving needs of the public sector. Scholars explore how such collaborations contribute to a talent pipeline that is well-prepared for the demands of the UAE's future workforce (Saaed, et al., 2023).

2.7 Predictive AI Analysis and KPIs in UAE Public Sector HR

2.7.1 The UAE Context

The integration of Predictive AI analysis and KPIs in the HR management of the UAE public sector is a topic gaining increasing attention, and there is a growing body of literature exploring this intersection within the unique context of the UAE (Li, et al., 2023). Studies specific to the UAE context often emphasise the role of predictive AI analysis in supporting Emiratisation initiatives. Research explores how predictive models can aid HR professionals in forecasting workforce requirements, identifying

skill gaps among Emirati talent, and designing targeted recruitment and development programs. The aim is to align predictive HR analysis with national objectives, ensuring a strategic approach to achieving Emiratisation goals and enhancing the growth of a skilled national workforce (Singh & Shaurya, 2021; Alhashmi, et al., 2019).

In the context of the UAE public sector, studies focus on how predictive AI analysis enhances talent acquisition and retention strategies. Research delves into the use of predictive models to identify high-potential candidates, assess the likelihood of employee turnover, and recommend personalised retention strategies. By leveraging AI-driven insights, HR practitioners in the UAE public sector can optimise their talent management strategies, ensuring the retention of critical skills and knowledge within organisations (Alhashmi, et al., 2019; Singh & Shaurya, 2021).

Given the dynamic and diverse workforce in the UAE, studies explore how predictive AI analysis helps HR professionals adapt to evolving workforce needs. This includes anticipating changes in skill requirements, predicting shifts in job roles, and identifying emerging trends in the labour market. By utilising predictive analytics, HR in the UAE public sector can proactively align workforce planning with the economic development of the country, and ensure that the public sector remains flexible in responding to changing demands (Singh & Shaurya, 2021; Basnet, 2024).

Studies specific to the UAE context also focus into how predictive AI analysis contributes to enhancing employee performance. By leveraging KPIs and predictive models, HR professionals can gain insights into individual and team performance trends.

This allows for the identification of areas for improvement, personalised development plans, and interventions to boost overall productivity. The focus is on aligning performance management with organisational goals and leveraging predictive analytics to drive a culture of continuous improvement (Alhashmi, et al., 2019; Basnet, 2024).

Given the importance of fairness and transparency in the UAE's cultural and legal context, studies explore the ethical considerations associated with the use of predictive AI in HR decision-making. Researchers investigate how organisations ensure fairness in algorithmic processes, address biases, and maintain compliance with

regulations (Gryncewicz, et al., 2023; Mohammed, 2019). This emphasis on ethical AI aligns with the UAE's commitment to ensuring that HR practices uphold principles of justice and equity. Studies often highlight the need for customisation of predictive AI models to suit the specific characteristics of the UAE workforce. This includes considerations for cultural diversity, language factors, and the unique expectations of employees in the UAE public sector. Customised models take into account the context-specific factors that influence HR practices, ensuring that predictive insights are relevant and actionable within the UAE's organisational environment (Budhwar, et al., 2019; Mohammed, 2019).

Research in the UAE context also emphasises the alignment of predictive AI analysis and KPIs with the broader national vision and strategic objectives. Scholars explore how HR practices can contribute to the realisation of the UAE's economic diversification goals and societal development plans. This strategic alignment ensures that predictive HR analytics is not only a functional enhancement but a crucial enabler of the country's long-term vision (Li, et al., 2023). Studies delve into the regulatory frameworks governing the use of AI in HR within the UAE. Researchers explore how organisations navigate compliance with data protection laws, labour regulations, and ethical guidelines. Understanding the legal factors ensures that the implementation of predictive AI analysis aligns with the UAE's commitment to ensuring privacy, security, and responsible AI usage (Li, et al., 2023).

In conclusion, the exploration of studies specific to the UAE context regarding predictive AI analysis and KPIs in the public sector HR domain reflects a distinct understanding of the unique challenges and opportunities within the country.

This body of literature contributes valuable insights for HR practitioners, policymakers, and researchers aiming to leverage the power of predictive analytics in shaping HR strategies aligned with the dynamic and ambitious goals of the UAE. As the field continues to evolve, these studies provide a foundation for further research and practical applications in the dynamic HR environment of the UAE public sector.

2.7.2 Challenges and Opportunities Faced by UAE Public Sector Organisations

As organisations strive to embrace technologies such as predictive AI and AI-measured KPIs, they navigate complexities that are intrinsic to the dynamic environment of the UAE. The UAE places a significant emphasis on cultural values and ethical principles. Challenges arise in adopting predictive AI and AI-measured KPIs as organisations struggle with ensuring that these technologies align with cultural norms and ethical standards (Al Mazrouei & Pech, 2015). Striking a balance between technological advancement and cultural sensitivity is essential to gain acceptance and trust. The nature of AI relies heavily on data, thus raising concerns about privacy and security. The UAE public sector faces the challenge of safeguarding sensitive information while leveraging data for predictive insights. Stricter data protection regulations and ensuring compliance become imperative to address concerns and build confidence among citizens and stakeholders (Sarabdeen & Moonesar, 2018).

Implementing predictive AI requires a skilled workforce adept at handling advanced analytics and machine learning. The challenge lies in developing existing staff or recruiting professionals with expertise in these technologies (Morandini, et al., 2023; Zirar, et al., 2023). Additionally, the adoption of AI often necessitates a cultural shift, and change management becomes crucial to ensure a smooth transition and mitigate resistance within the organisation (Rozman, et al., 2023). Many UAE public sector organisations operate with systems that were not designed to accommodate advanced AI technologies. Integrating predictive AI and AI-measured KPIs with existing infrastructure thus poses a significant technical challenge. Compatibility issues, system upgrades, and seamless integration become key considerations in adopting these technologies (Perifanis & Kitsios, 2023; Rozman, et al., 2023).

AI algorithms can inadvertently inherit biases present in historical data. Ensuring fairness and mitigating bias in predictive models is a critical challenge. UAE public sector organisations must handle the complexities of addressing bias to avoid discriminatory outcomes, especially in HR practices where fairness and equality are supreme (Tuffaha, 2023). In certain sectors, especially those experiencing rapid growth and transformation, there may be limited historical data available. This poses a

challenge for predictive AI systems that rely on historical patterns to make accurate predictions. Organisations need to devise strategies to compensate for this limitation, such as leveraging alternative data sources or focusing on real-time analytics (Ahmed, 2018).

Predictive AI provides UAE public sector organisations with the opportunity to engage in strategic workforce planning. By analysing data trends and predicting future workforce needs, organisations can ensure they have the right talent in place to meet their strategic objectives. This proactive approach enhances organisational agility and responsiveness (Almarashda, et al., 2022; Zuiderwijk, et al., 2021). Predictive AI offers the opportunity to make more informed and data-driven decisions. By leveraging AI-measured KPIs, organisations gain insights into performance metrics and trends, enabling leaders to make strategic decisions with a higher level of confidence. This data-driven decision-making can lead to improved efficiency and effectiveness across various departments (Nyathani, 2023; Murugesan, et al., 2023; Jogarao, et al., 2023).

The use of predictive AI in HR can revolutionise talent acquisition and retention strategies. By analysing data to identify high-performing candidates and predicting potential turnover risks, organisations can customise their recruitment and retention efforts. This leads to a more efficient allocation of resources and the ability to attract and retain top talent (Geetha & BhanuSree, 2018). Predictive AI also creates opportunities for innovation in the delivery of public services. From optimising traffic management to predicting maintenance needs in public infrastructure, organisations can leverage AI to enhance the quality and efficiency of public services. This not only improves satisfaction among people but also contributes to the overall development goals of the UAE (Zuiderwijk, et al., 2021; Chen, et al., 2023).

In sectors where the public sector interacts directly with citizens, such as healthcare or public services, predictive AI can enhance the customer experience. By predicting service demands, optimising resource allocation, and personalising interactions, organisations can provide citizens with more efficient and tailored services (Zuiderwijk, et al., 2021; Osborne, et al., 2022). Adopting predictive AI and AI-measured KPIs accelerates the digital transformation journey of UAE public sector organisations. This presents an opportunity to modernise processes, improve

operational efficiency, and stay at the forefront of technological innovation. By embracing and excelling in the implementation of predictive AI, the UAE also has the opportunity to position itself as a global hub for AI innovation. Organizations can contribute to the development of AI technologies, share best practices, and attract international talent, supporting a flourishing ecosystem for AI research and application (Zuiderwijk, et al., 2021; Murugesan, et al., 2023; Gryncewicz, et al., 2023).

2.7.3 Comparative Analysis with Global Trends

The UAE's approach to Predictive AI and KPIs in HR acknowledges the significance of cultural factors. While global trends emphasise standardised solutions, the UAE prioritises localisation. The emphasis on Emiratisation, which is nationalisation of the workforce, demonstrates this approach, showcasing a unique strategy that aligns with the cultural and demographic context of the country. This differs from global trends where cultural considerations might not be as pronounced in HR technology adoption (Lina, 2018). In alignment with global concerns, the UAE places a strong emphasis on ethical AI and fairness in HR practices. The recognition of the potential biases in predictive models and the commitment to addressing them align with a global trend emphasising responsible AI. Organisations worldwide are increasingly recognising the importance of ethical considerations in AI applications to ensure fairness, transparency, and compliance with ethical standards (Singh & Shaurya, 2021; Rodgers, et al., 2023).

As organisations worldwide seek to harness the benefits of AI for talent management and strategic workforce planning, the UAE's public sector stands out for its proactive approach. The focus on becoming a leader in AI applications aligns with the global recognition of the transformative potential of AI in reshaping HR functions.

The emphasis on data-driven decision-making in HR, facilitated by Predictive AI and KPIs, is another globally shared trend (Halaweh, 2018). Organisations around the world recognise the power of analytics in gaining insights, enhancing decision-making, and optimising HR strategies. The UAE's alignment with this trend reflects a

global acknowledgment of the role of data in shaping HR practices and organisational performance (Ahmed, 2018; Murugesan, et al., 2023).

Both the UAE and global organisations face challenges in talent acquisition and retention, and the application of Predictive AI offers solutions to these common issues. The global trend of leveraging AI for identifying high-potential candidates, predicting turnover risks, and optimising talent management aligns with the UAE's objectives. The shared challenges highlight the universal relevance of AI applications in addressing workforce dynamics. Technological integration and automation in HR processes are global trends, driven by the need for efficiency and agility (Vedapradha, et al., 2023; Geetha & BhanuSree, 2018).

The UAE's public sector mirrors this trend by incorporating Predictive AI and KPIs into HR operations. This matches with the global shift toward HRIS (Human Resource Information Systems), AI-driven recruitment, and automated performance management systems as organisations seek to streamline processes and enhance productivity (Fenech, et al., 2019; Quaosar & Rahman, 2021). The global trend of prioritising employee experience and well-being in HR practices is also reflected in the UAE's approach. Predictive AI enables organisations to personalise employee experiences and proactively address well-being concerns. This trend aligns with the broader international recognition that a positive employee experience contributes to engagement, retention, and overall organisational success (Fenech, et al., 2019; Quaosar & Rahman, 2021).

2.8 Hypotheses Development

2.8.1 Predictive AI Analysis and HR Effectiveness

Predictive AI analysis has increasingly become one of the most significant technological developments influencing strategic human resource management. Organizations are progressively adopting predictive analytics, machine learning algorithms, and AI-driven forecasting systems to support evidence-based HR decision-making. Through the use of historical workforce data, predictive AI can identify patterns associated with employee turnover, absenteeism, recruitment

success, workforce planning, and employee performance outcomes (Vedapradha et al., 2023). Unlike traditional HR systems that primarily provide descriptive reports, predictive AI enables organizations to move toward proactive and strategic HR practices by forecasting future workforce trends and identifying potential organizational risks before they occur.

From a theoretical perspective, the Resource-Based View (RBV) suggests that organizational capabilities and strategic resources can generate sustainable competitive advantage when they improve organizational efficiency and decision quality. Predictive AI systems can therefore be viewed as strategic technological capabilities that strengthen HR effectiveness through improved workforce planning, faster decision-making, and more efficient allocation of organizational resources. In addition, Technology-Organization-Environment (TOE) theory explains that technological innovation contributes to organizational performance when the technology is effectively integrated into operational processes and aligned with organizational needs. Within HR departments, predictive AI may support more accurate recruitment decisions, reduce bias in candidate selection, improve talent retention strategies, and enhance employee performance monitoring.

Practical evidence also indicates that predictive AI applications can significantly improve HR functions. Organizations using AI-enabled analytics are increasingly able to automate repetitive administrative tasks, allowing HR professionals to focus more on strategic and developmental activities. AI-driven systems may also improve employee experience through personalized recommendations, adaptive learning systems, and predictive career development planning. In public-sector organizations, where workforce management is often characterized by bureaucratic structures and large employee populations, predictive AI can contribute to operational efficiency by simplifying workforce forecasting and improving administrative coordination.

However, the relationship between predictive AI analysis and HR effectiveness is not universally accepted in the literature. Several scholars argue that the adoption of predictive AI does not automatically guarantee improved HR outcomes (Pillai and Sivathanu, 2020). The effectiveness of predictive systems may depend on factors such as organizational readiness, employee acceptance, data quality, managerial capabilities, and integration with existing HR practices. Moreover, concerns relating to algorithmic bias, transparency, ethical accountability, and data

privacy may reduce employee trust in AI-supported HR systems. Such concerns may be particularly important in public-sector organizations where accountability, procedural fairness, and transparency are highly emphasized.

Furthermore, most existing AI-HRM studies are concentrated within private-sector organizations and developed economies, while limited empirical evidence exists regarding AI implementation within the UAE public sector context (Nyathani, 2023; Murugesan et al., 2023). The UAE public sector represents a unique institutional environment influenced by digital transformation strategies, smart government initiatives, and centralized administrative structures. Therefore, examining whether predictive AI analysis contributes positively to HR effectiveness within this context becomes both theoretically and practically important.

Based on the theoretical arguments and practical evidence discussed above, the study proposes the following hypothesis:

H1: Implementation of Predictive AI Analysis in HR positively impacts HR effectiveness.

2.8.2 AI-Measured KPIs and HR Effectiveness

Key Performance Indicators (KPIs) have long been considered essential tools for measuring employee performance, organizational productivity, and strategic goal achievement. Traditional KPI systems often depend on periodic manual evaluations and subjective managerial judgments, which may limit accuracy, consistency, and responsiveness. Recently, AI-driven KPI systems have emerged as advanced alternatives capable of providing real-time monitoring, predictive assessment, automated evaluation, and data-driven performance management (Nyathani, 2023; Patel, 2023). These systems use machine learning algorithms and intelligent analytics to process large amounts of workforce data and generate more dynamic and responsive performance evaluations.

Theoretically, performance management theory suggests that accurate and timely performance information improves organizational decision-making and employee productivity. AI-measured

KPI systems may therefore enhance HR effectiveness by improving the objectivity, consistency, and speed of employee performance evaluations. In addition, Dynamic Capability Theory explains that organizations capable of integrating technological innovations into operational processes are more likely to adapt successfully to changing environmental conditions. AI-enabled KPI systems may support this adaptability by enabling HR departments to monitor employee performance continuously and respond rapidly to organizational challenges.

From a practical perspective, AI-measured KPIs can contribute to workforce optimization by identifying productivity patterns, detecting skill gaps, and supporting personalized employee development initiatives. AI systems may also reduce administrative burden through automation of performance tracking and reporting functions. This allows HR professionals to allocate greater attention toward strategic workforce development and employee engagement activities. In the UAE public sector, where governments increasingly prioritize digital transformation and service efficiency, AI-based KPI systems may support institutional modernization and performance accountability.

Nevertheless, critical perspectives within the literature caution against excessive dependence on algorithmic performance measurement systems. Scholars argue that AI-driven KPI systems may overemphasize measurable quantitative outcomes while overlooking qualitative dimensions of employee performance such as creativity, collaboration, organizational citizenship behavior, and emotional intelligence (Murugesan et al., 2023). Additionally, employees may perceive AI-based evaluations as impersonal, intrusive, or unfair, particularly if algorithmic processes lack transparency. Such perceptions may reduce employee trust and negatively influence organizational culture.

Moreover, public-sector organizations operate differently from private-sector firms due to their emphasis on accountability, regulatory compliance, and public value creation. Consequently, the effectiveness of AI-measured KPI systems within public institutions cannot be assumed without empirical investigation (Jogarao et al., 2023). The UAE public sector provides an important context for examining whether AI-driven KPI systems contribute positively to HR effectiveness while operating within complex institutional and administrative structures.

Based on these theoretical discussions and practical considerations, the following hypothesis is proposed:

H2: Application of AI-measured KPIs in HR processes positively impacts HR effectiveness.

2.8.3 Mediating Role of Implementation Efficiency

Although AI technologies possess significant transformative potential, the success of technological innovation within organizations depends not only on the technology itself but also on the quality and efficiency of implementation processes. Implementation efficiency refers to the extent to which AI systems are effectively integrated into organizational operations, aligned with HR strategies, supported through employee training, and governed through clear managerial structures (Shams et al., 2023; Ahmed, 2018). Within AI-HRM environments, implementation efficiency determines whether technological capabilities can be successfully translated into organizational outcomes.

Theoretical perspectives such as Socio-Technical Systems Theory emphasize that organizational performance results from the interaction between technological systems and social structures. This implies that advanced AI technologies may fail to improve HR effectiveness if organizations lack appropriate implementation mechanisms, employee support systems, or operational integration. Similarly, Institutional Theory suggests that organizational structures, norms, and routines influence how technological innovations are adopted and utilized within institutional environments.

In practical terms, organizations often experience implementation challenges during AI adoption, including resistance to change, lack of technical expertise, insufficient training, poor communication, and weak integration with existing HR systems. Such implementation barriers may reduce the effectiveness of predictive AI systems and AI-based KPI applications. Even sophisticated AI technologies may generate limited value when implementation processes are fragmented or poorly managed (Jogarao et al., 2023; Nyathani, 2023). Conversely, organizations

with strong implementation capabilities may maximize the value generated by AI technologies through effective coordination, leadership support, and strategic alignment.

Within the UAE public sector, implementation efficiency becomes especially important because public organizations often operate within highly structured administrative environments characterized by formal procedures and hierarchical governance systems. Successful AI implementation therefore requires not only technological investment but also organizational readiness, process alignment, leadership commitment, and workforce adaptation.

Accordingly, implementation efficiency is conceptualized in this study as a mediating mechanism through which predictive AI analysis and AI-measured KPIs influence HR effectiveness. The effectiveness of AI technologies may depend significantly on how efficiently these systems are implemented and integrated into HR operations.

Based on these arguments, the following hypotheses are proposed:

H3: Implementation efficiency mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness.

H4: Implementation efficiency mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness.

2.8.4 Mediating Role of Employee Readiness

Employee readiness refers to the cognitive, emotional, and behavioral preparedness of employees to accept, adopt, and effectively utilize AI-driven technologies within organizational settings. Existing digital transformation literature consistently emphasizes that employee attitudes, perceptions, and capabilities play critical roles in determining the success of technological innovation initiatives (Smita et al., 2023; Cramarenco et al., 2023). Within AI-enabled HR systems, employee readiness becomes particularly important because AI technologies directly influence work processes, decision-making structures, and performance evaluation systems.

The Technology Acceptance Model (TAM) explains that individuals are more likely to adopt technological systems when they perceive them as useful, easy to use, and beneficial to their work performance. Similarly, Change Management Theory suggests that employee resistance may emerge when organizational changes create uncertainty, fear, or perceived threats to job security. In the context of AI adoption, employees may express concerns regarding automation, job displacement, algorithmic fairness, data privacy, and managerial surveillance (Zuiderwijk et al., 2021). These concerns may reduce trust in AI systems and negatively affect adoption outcomes.

From a practical perspective, employee readiness influences whether AI technologies are effectively utilized within HR operations. Employees who possess digital competencies, technological confidence, and positive attitudes toward innovation are more likely to engage constructively with AI-driven systems. Conversely, employees lacking technological skills or trust in AI may resist implementation efforts, thereby reducing the effectiveness of predictive AI analysis and AI-measured KPI systems. Employee readiness may therefore determine whether AI investments produce meaningful improvements in HR effectiveness.

Public-sector organizations may face additional challenges in fostering employee readiness due to bureaucratic structures, rigid administrative procedures, and cultural resistance to technological change (Chen et al., 2023). In the UAE public sector, despite strong national support for digital transformation, differences in technological capabilities, organizational culture, and employee adaptation may influence the success of AI implementation initiatives. Therefore, employee readiness may function as a critical mechanism linking AI practices with HR outcomes.

Accordingly, this study conceptualizes employee readiness as a mediating variable that influences the extent to which predictive AI analysis and AI-measured KPIs contribute to HR effectiveness. The success of AI-enabled HR initiatives may depend significantly on employees' willingness and preparedness to engage with these technologies effectively.

Based on these theoretical and practical considerations, the following hypotheses are proposed:

H5: Employee readiness mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness.

H6: Employee readiness mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness.

2.9 Synthesis and Gaps in the Literature

2.9.1 Integrative Synthesis of the Literature

The research performed an integrative synthesis of the literature, which was presented as follows:

Altogether, the literature reviewed makes predictive AI analysis and AI-measured KPIs a strategic facilitator of the modern HR transformation. Researchers are always convinced that AI is beneficial in improving data-driven decision-making, workforce forecasting, and performance evaluation mechanisms (Tambe et al., 2019; Patel, 2023; Murugesan et al., 2023). In the UAE state sector, this technological direction is adjusted to the more general national digital transformation priorities and strategic human resource planning.

Nevertheless, a more intensive review of the literature shows that the correlation between AI adoption and HR effectiveness is not linear. Although many studies believe in the performance-enhancing capabilities of predictive analytics, some studies highlight the complexity of implementation, institutional barriers, and human resistance as limiting factors (Cappelli et al., 2018; Enholm et al., 2021). This is an inconsistency in results that implies that AI adoption by itself cannot be an adequate source of improvement in HR effectiveness. Instead, it seems performance outcomes would depend on organizational processes through which technological capability is converted into operational value.

The present conceptual model is clearly informed by this observation. The literature confirms that there is a direct correlation between AI practices and HR effectiveness (supporting H1 and H2), but at the same time there are process-based and people-centered conditions, which define the outcome. Thus, the model goes beyond

the simplistic adoption-performance assumptions because two of the mediating mechanisms are the implementation efficiency and employee readiness (H3-H6).

Moreover, despite the studies emphasizing the significance of the ethical AI, the cultural fit, and the regulatory adherence to the situation in the UAE (Kumar et al., 2022; AlNuaimi et al., 2022), such discussions are not analytical but descriptive. Modelling of the effects of these contextual dynamics on the effectiveness pathway between AI and HR outcomes is insufficiently empirically modelled. The current research paper overcomes this theoretical weakness by directly modeling internal organizational processes that help to comprehend how AI can be translated into quantifiable HR performance.

The literature offers convincing reasons as to why AI-driven HR systems should be studied, and it does not have a unified explanatory framework that explains the causal mechanisms at play. The paper at hand addresses this shortcoming by creating and validating a conceptual model of mediation within the UAE context of the public sector.

2.9.2 Identification of Research Gaps and Contribution of the Present Study

Although the academic interest in the field of AI-enabled HR systems is increasing, there are a number of gaps in the conceptual sense and empirical evidence. First, most of the available studies consider the adoption of AI on a macro or strategic level without operationalizing HR effectiveness as a measurable outcome variable adequately. Research usually presupposes positive organizational impact without modelling the processes in which AI creates value dynamically (Patel, 2023; Murugesan et al., 2023). The present research is a workaround for this issue since it empirically determines the direct impacts of predictive AI analysis and AI-measured KPIs on HR effectiveness (H1 and H2).

Second, a theoretical gap exists in regard to the internal processes through which AI-performance relations are contemplated. Despite more often than not recognizing the problems of implementation, little has been conceptualized formally as a mediating construct. The focus of the implementation efficiency as mediator (H3 and H4) makes

this study a progress on a process-based explanation rather than a mere adoption model.

Third, although employee preparedness and trust towards AI change are extensively debated in the technology acceptance literature, they are scarcely incorporated in HR performance models in the context of the public sector. The lack of mechanisms that focus on the employees brings a partial perception of the effectiveness of AI. This gap is filled in the current study because employee readiness is modeled as a mediating variable (H5 and H6), and thus, behavioral and organizational readiness dimensions are introduced into the explanatory model.

Fourth, there is a dearth of empirical studies with a narrow scope, namely the UAE public sector. Current literature tends to use global or corporate approaches, which do not take into account the institutional features, governmental frameworks, and nationalization of labor specific to the UAE setting. Since the conceptual model is placed in the context of the UAE public sector, this research yields contextualized evidence that is both relevant to the regional and international scholarship.

Lastly, literature does not present a unified framework that would study technological capability (predictive AI and AI-measured KPIs), organizational process (implementation efficiency), and human factors (employee readiness) in a single explanatory framework. The current study is novel to the extent that it combines all of these dimensions into a mediation-based framework that enhances the theoretical knowledge base and provides practical implications for HR transformation using AI.

2.10 Summary

The literature review on the integration of predictive AI analysis and AI-measured KPIs in the HR practices of the UAE public sector has led to significant insights, revealing a dynamic business environment shaped by technological advancements, cultural considerations, and strategic imperatives. This summary presents the key findings into several principal themes, highlighting the transformative potential, challenges, and unique characteristics of AI-driven HR practices in the UAE context.

The literature emphasises the key role of predictive AI analysis in enhancing HR efficiency within the UAE public sector. Advanced analytics, machine learning algorithms, and AI-driven platforms are brought together to streamline talent acquisition, optimise workforce planning, and elevate employee performance management. The integration of predictive AI emerges as a basis for organisations seeking to leverage data-driven insights for strategic HR decision-making. The emphasis on technological infrastructure reflects a global trend of embracing AI to navigate the complexities of modern HR management.

A significant disclosure from the literature is the emphasis on cultural integration of predictive AI solutions within the HR practices in the UAE public sector. By recognising the diverse and culturally rich workforce, organisations prioritise the customisation of AI technologies to align with local factors, language preferences, and societal norms. The cultural adaptability of AI emerges not merely as a technical requirement but as a strategic imperative for supporting employee acceptance and engagement. This insight underlines the importance of harmonising technological advancements with the cultural environment of the UAE to ensure the smooth and continuous integration of AI in HR practices.

Aligned with the national vision, the literature highlights the strategic utilisation of predictive AI to support Emiratisation initiatives and advance national workforce development goals. Predictive analytics proves helpful in forecasting workforce requirements, identifying skill gaps, and designing targeted recruitment and development programs for the local workforce. The integration of AI in HR emerges as a supportive factor for aligning HR strategies with broader national objectives, positioning HR as a key driver in achieving a skilled and empowered Emirati workforce.

Ethical considerations form a crucial dimension in the integration of predictive AI in HR, reflecting a commitment to responsible AI usage. The literature emphasises the need for ethical AI practices, ensuring fairness, transparency, and accountability in HR processes. Trust emerges as a critical factor in this regard, with the perception of ethical AI positively influencing employee trust in AI-driven HR practices. This insight

highlights the dual responsibility of organisations to connect with AI's potential while upholding ethical standards and maintaining employee trust in the technology.

Predictive AI emerges as a revolutionary in talent acquisition and retention strategies within the UAE public sector. The literature reveals that AI-driven insights facilitate the identification of high-potential candidates, predict turnover risks, and optimise recruitment efforts. KPIs related to talent acquisition and retention serve as measurable indicators of the effectiveness of predictive AI interventions. This insight positions AI as a strategic enabler for organisations aiming to gain a competitive edge in attracting and retaining top talent in a rapidly evolving job market.

Amid the transformative potential of AI, the literature acknowledges the importance of addressing privacy concerns and ensuring robust data security measures. Organisations recognise the need to safeguard employee data and adhere to ethical guidelines and regulatory frameworks. The effective handling of privacy concerns emerges as an influence on employee trust in AI-driven HR practices. This insight emphasises the significance of establishing a secure and ethical foundation for the implementation of predictive AI in HR.

The literature also points towards the distinct impact of predictive AI on employee well-being. While AI offers efficiency gains, there is a recognition of the need to consider long-term implications on job satisfaction and overall well-being. Effective communication about AI's role in HR practices emerges, mitigating potential negative impacts and supporting positive employee experiences over time. This insight reflects the need for a holistic approach that balances short-term gains with a sustainable and employee-centric perspective on AI integration.

A significant finding is the transformative effect of predictive AI on the roles of HR professional. The literature suggests that the integration of AI leads to a redefinition of HR roles, necessitating new skill requirements and responsibilities. HR professionals are positioned as key players in directing the evolving roles, requiring adaptability to embrace AI-driven changes. This insight highlights the importance of continuous professional development and upgradation for HR professionals to effectively navigate the changing environment of HR management.

To summarise, the literature review has shed light on a multifaceted environment where predictive AI and AI-measured KPIs redefine HR practices in the context of the UAE public sector. Technological advancements, cultural sensitivity, and strategic alignment with national goals have emerged as central themes. Ethical considerations, talent management strategies, and the evolution of HR professional roles have shaped the narrative, underlining the need for organisations to navigate this transformative journey with a holistic and adaptive approach. The insights that have been gathered from the literature review serve as a foundation for empirical research and practical applications, guiding organisations in realising the potential of predictive AI in HR within the unique context of the UAE.

Chapter 3: Conceptual Framework & Hypotheses Development

3.1 Introduction

The UAE has been a leading nation, in respect of adopting advanced technologies, and supporting its innovation across different business sectors. This includes the public sector as well, wherein the country increasingly focuses on utilising technological advances and tools to improve its services and make them more efficient. Here, it may be noted that the predictive AI analysis makes use of advanced algorithms and tools of machine learning applications, which allow analysis of vast amounts of data, predict trends of the future, to assess future possible business outcomes or performances (Mohture, 2023; Albassam, 2023; Li & Fox, 2023; Rohit & Ajit, 2016).

Considering the application of AI in HR, it is notably found that, traditional HR can be significantly transformed and revolutionised using predictive AI analysis. It has the potential to lead to more effective workforce planning in an organisation, making predictions on employee turnovers, identifying potential sources of recruitment, and developing optimal strategies for managing key talents in the organisation. With AI based analysis, it is possible to have key predictive insights on trends and performances, which in turn allows an organisation and its HR teams to make effective informed decisions (Sheshadri & Palivela, 2023; Prakash, 2019; Aparanji, 2023; Mikalef, et al., 2023).

Similarly, with the application of AI-measured KPIs, it is possible to engage a data-driven approach in assessing the performance of an organisation while also measuring organisational progress in effectively fulfilling the strategic objectives. In the context of the UAE public sector, the potential of the AI-measured KPIs lies in that these can enable evaluations of performance in an organisation, along with the effectiveness of the initiatives considered by the government. With AI, it is possible to have real time insights on the performance of an organisation which in turn can be used by the management to make organisational decisions that is proactive in nature. As a result, an organisation experiences the scope of continuous improvement in its

performances and delivery (Sheshadri & Palivela, 2023; Prakash, 2019; Aparanji, 2023; Mikalef, et al., 2023; Dias, et al., 2023).

There are a number of factors that are driving the adoption of AI-measured KPIs and predictive analysis in public sector organisations, which can be realised as applicable in the case of the UAE as well. Firstly, the UAE government has prioritised digital transformation and the integration of AI across all business sectors, which is aimed towards promoting the economic growth of the country as well as to enhance the overall quality of life. Secondly, the increasing amount of data that is produced within organisations, leads to both positive impacts and challenges in utilising the AI technologies to improve decision-making processes and obtain meaningful insights. It may be noted here that, the UAE public sector is in a favourable business environment for adopting AI, as it is supported by the availability of advances in AI technology, government support for innovation, and a qualified workforce.

3.2 Framework for the Research Variables

3.2.1 Overview of Predictive AI Analysis and AI-Measured KPIs

In the context of the contemporary business environment, the tools of predictive AI analysis, and AI-measured KPIs offer transformation in data-driven operations and decisions. This contributes to operational efficiency across the different business sectors as well, including the HR functions. Predictive AI analysis makes use of machine learning algorithms and statistical techniques, based on which data is analysed, and in the process, an organisation is capable of predicting trends of future operations, as well as business outcomes (Gandomi, et al., 2023; Maharana, et al., 2022).

Such data and technology-based assessments and analyses enable improved and informed decision-making wherein the role of the AI is crucial in offering predicted patterns in data. This therefore benefits the HR professionals in an organisation to predict their employee turnovers, or sources from where they can identify talented employees, while ensuring that they can optimise their workforce management

strategies as well (Mohture, 2023; Albassam, 2023; Li & Fox, 2023; Rohit & Ajit, 2016).

On another hand, the AI-measured KPIs make use of the AI tools to monitor, analyse and present analytical reports on key performance indicators of an organisation. With use of the AI systems, data is collected and analysed that allows performance analysis based on real-time insights. In the context of HR, this is AI-measured KPIs enable an organisation to study and analyse a number of metrics such as levels of employee productivity, employee engagement levels, effectiveness of training, and rates of compliance. This therefore offers a comprehensive analysis of the overall organisational performance and effectiveness of HR. When such AI-measured KPIs are integrated with predictive AI analysis, it leads to key advantages in terms of enhanced efficiency, accuracy, planning and decision making for an organisation (Sheshadri & Palivela, 2023; Prakash, 2019; Aparanji, 2023; Mikalef, et al., 2023).

3.2.2 HR Effectiveness in Public Sector Organizations

In the context of public sector organisation, the measure of HR effectiveness offers insights on how the HR department of the organisation is effective in achieving the organisational goals and objectives, by considering its specific HR related goals and actions. Effectiveness of HR functions can be realised as essential for public sector organisations, as the organisations must have strategic workforce planning, effective talent acquisition and management in place, and also ensure that employees are effectively engaged, which are key factors driving the overall performance of the organisation (Sarker & Rahman, 2020; Forstenlechner, et al., 2012).

With effectiveness of HR, it is possible for the public sector organisations to attract, develop, and retain skilled and motivated employees, who can be committed to their tasks that are necessary for excellence in public service deliveries. Thus, the factor of HR effectiveness is associated with developing and maintaining a positive workplace culture so that the factors of diversity, equality, and inclusion may be supported, and which in turn also engage employees effectively towards contributing to

overall innovation and improvement measures of the organisation as a whole (Al Awadhi & Muslim, 2023; Fahim, 2018; Sarker & Rahman, 2020; Fenech, et al., 2019).

Furthermore, in respect of the advances in digital technologies and data analytics, it may be noted here that the HR departments in public sector organisations have key benefits to experience, such as by gaining insights on trends related to employees and performances, or turnovers, staffing requirements, and also in measuring the impacts of HR initiatives considered. Such analytics has the potential to contribute to the overall HR effectiveness in the organisations. HR effectiveness thus may be realised the measure that can determine the impact of HR strategies, tools and actions towards being able to leverage the existing manpower for effectiveness of performance (Fenech, et al., 2019; Al Kassem, et al., 2017; Aarthi & Sahu, 2021).

3.2.3 Conceptualizing Independent and Dependent Variables

Conceptualising the independent and dependent variables is essential for the research as it would offer a direction to the study, while ensuring clarity in the steps that need to be considered. Here, independent variables are those that the study would examine to determine how they impact the dependent variables, wherein the dependent variable is the factor, the outcome of which is dependent on how the independent variables are operating. It is based on the relationship between the independent and dependent variables that, the hypotheses for the research have been developed, and would be tested. The hypotheses testing, in the context of the current research, will determine whether and how the independent variables are impacting the outcomes of the dependent variable, the data being focused on the case of the UAE public sector organisations.

In this study, the study is focused on assessing the impacts of implementation of predictive AI analysis in HR, and application of AI-measured KPIs, on the HR effectiveness of the organisations. Thus, here, the independent variables constitute two factors – one being the implementation of predictive AI analysis in HR, and second being the application of AI-measured KPIs; and the dependent variables here is the

factor of HR effectiveness (Mohture, 2023; Albassam, 2023; Rohit & Ajit, 2016; Sheshadri & Palivela, 2023; Aparanji, 2023; Mikalef & Gupta, 2021).

This study also examines the impacts of two additional variables—implementation efficiency and employee readiness—on the relationship between the independent and dependent variables (Vedapradha, et al., 2023; Pillai & Sivathanu, 2020; Sheshadri & Palivela, 2023; Prakash, 2019; Ezzaim, et al., 2023). By incorporating these variables, the research develops suitable hypotheses and aligns the methodology accordingly.

3.2.4 Conceptualizing Variables

Similar to the conceptualisation of the independent and dependent variables, the conceptualisation of the mediating variables of the study is also important. This is primarily essential as the mediating variables have a key role to play in defining or impacting the relationship between the independent and dependent variables of the study. This implies that while the independent variables may directly impact the dependent variable; however the mediating variables can further influence the relationship between the independent and dependent variables.

Here, it may be noted that a key difference that the mediating variables have from that of the independent variables is that the impacts of the mediating variables are not necessarily direct on the dependent variables. However, they can impact the level and direction of the relationship between an independent variable and a dependent variable, hence also making it important to assess such factors with key insights, while analysing the relationship between independent and dependent variables, as is being considered in this study.

In this study, the implementation efficiency, and employee readiness are the two mediating variables that are being studied, to determine whether and how these two factors influence the relationship between the predictive AI analysis in HR and HR effectiveness, and between AI-measured KPIs and HR effectiveness. Analysing the mediating variables alongside the key research variables would allow the study to have a more distinct understanding of the when and how the predictive AI analysis and AI-

measured KPIs impact HR effectiveness within the organisations, thereby offering insights into the necessary conditions that are required for maximising the benefits of AI in public sector HR management (Vedapradha, et al., 2023; Pillai & Sivathanu, 2020; Sheshadri & Palivela, 2023; Prakash, 2019; Ezzaim, et al., 2023).

3.2.5 Integration of Theoretical Concepts

Integrating key theoretical concepts can be said to have a major importance as it provides a basic framework for the research process to be conducted effectively. In the context of the current research two key theories are found to be relevant for integration to guide the analysis of the impacts of predictive AI analysis in HR, and AI-measured KPIs on HR effectiveness. These include the Technology Acceptance Model (TAM) and Diffusions of Innovations Theory.

According to the TAM, the acceptance of a technology significantly depends on the perceived usefulness of the technology among its users, and the ease of use which they perceive and consider. This theory therefore can be realised as critical in assessing the level of employee readiness and effective implementation of the AI technologies in HR (Mugo, et al., 2017). The Diffusion of Innovations Theory, on the other hand, provides insights on the speed, accuracy and ways in which technological advances and new ideas can disseminate within an organisation (Sahin, 2006).

Integration of these theories is important for the study to conceptualise the mediating variables of implementation efficiency and employee readiness. The theoretical integration may be stated as offering a foundational basis for analysing how the mediating factors influence or impact the AI implementation and applications in HR. the application of these theories therefore allows assessing both the direct impacts of the independent variables, as well as the indirect impacts of the mediating variables, on the dependent variable of HR effectiveness in the context of the public sector organisations (Mugo, et al., 2017; Sahin, 2006; Dearing & Cox, 2018).

3.3 Implementation of Predictive AI Analysis in HR

3.3.1 Definition and Overview

By the implementation of predictive AI analysis in HR, it implies the strategic implementation of AI advances and technologies to analyse existing data and be able to predict data trends for the future of performance in an organisation. This is an innovative approach based on the advances in AI, and is achieved through the applications of machine learning algorithms and data analytics, which enable forecasting trends and patterns in functions, operations, and outcomes within an organisation (Rustagi & Goel, 2022; How, et al., 2020). In the context of HR, these include assessments of employee turnover rates, employee performance levels, future staffing requirements, and potential gaps in employee skills (Maharana, et al., 2022; Qiao, et al., 2022).

With the adoption of predictive AI analysis in HR, an organisation is capable of experiencing a transformational shift towards data-driven actions and decisions. This allows HR professionals to be more proactive in their measures, strategies, and decisions, than only being reactive in their actions. As a result, the organisational effectiveness in the workplace tends to get positively influenced, while also positively impacting the satisfaction levels of employees (Rustagi & Goel, 2022; How, et al., 2020; Qiao, et al., 2022). With AI allowing an organisation to forecast its future trends, it becomes possible for the organisation to develop specific interventions that can be utilised to mitigate risks, make optimal usage of available opportunities, as well as to align effectively with the required workforce planning considering long-term goals of the business (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020).

Some of the key areas where predictive AI analysis has more significant impacts include acquisition of talented employees, wherein algorithms have the potential to predict success of candidates; employee retention, wherein the AI advances can help to analyse the possible turnover cases; and development of talents, wherein AI helps through development of advanced personalised learning and career development

recommendations (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020).

3.3.2 Importance of Predictive AI Analysis in HR

Predictive AI analysis has a crucial role to play in talent acquisition and employee retention within an organisation. By analysing patterns related to employee data specific to an organisation, AI advances can help the HR professionals to identify key characteristics of employees that are either high-performing or low-performing and predict the potential of success among the candidates. As a result, an organisation can consider more informed and effective recruitment strategies and retention programs that can be specifically targeted to employees as per requirement, thereby ensuring that the organisation can attract and retains the best talent (Mohture, 2023; Albassam, 2023; Rohit & Ajit, 2016).

Moreover, with predictive AI analysis it is possible to experience enhanced support for workforce planning and talent management in an organisation, as it allows forecasting the future staffing requirements along with identifying the skill gaps in employees. This foresight can guide organisations to prepare for changes and transformations within an industry and to also effectively adapt to technological advancements, while ensuring that their workforce can remain flexible and become more capable of addressing and fulfilling evolving demands in the business environment (Mohture, 2023; Albassam, 2023; Rohit & Ajit, 2016; Li & Fox, 2023).

Furthermore, predictive AI has the potential to enhance the engagement levels of employees in an organisation, while increasing their levels of satisfaction as it facilitates personalised career development plans and also identify the key factors that can impact employee morale in an organisation. This can be realised as a tailored approach applicable in HR management which can not only improve individual performance levels, but can also foster a positive organisational culture, which in turn results in an overall improved productivity and success of an organisation (Li & Fox, 2023; Gryncewicz, et al., 2023).

3.3.3 Factors Influencing Implementation

There are a number of factors that influence the successful implementation of predictive AI analysis in HR. These factors range from organisational culture and leadership support to technical capabilities and data quality a considered in an organisation. It is important to understanding these factors so that AI technologies can effectively be integrated into HR practices and their benefits can be maximised (Syed, et al., 2023; Mohammed, 2019; Diaz, et al., 2023).

The culture of an organisation has a significant role to play in how effectively an organisation can be ready to adopt AI technologies. Organisations that value innovation, experimentation, and continuous learning are generally more capable of embracing predictive AI analysis in HR. On the other hand, if a culture is resistant to change, then such resistances tend to cause hindrances in the implementation processes of such advances such as the predictive AI analysis in HR (Syed, et al., 2023; Mohammed, 2019; Diaz, et al., 2023; Shams, et al., 2023).

Strong support from organisational leadership is essential for driving AI initiatives. The role of leadership is essentially crucial to ensure that the change processes can effectively be achieved. The role of the senior leaders is important in this regard, who have the responsibilities to effectively make decision, allocate resources, and communicate the strategic importance of the technological advances so that organisational members and stakeholders can accept them and be aligned with the AI goals of the organisation (Syed, et al., 2023; Mohammed, 2019; Diaz, et al., 2023).

Another key factor is the prevalence of suitable technical infrastructure, such as including strong IT systems, data storage capabilities, and cybersecurity measures, so that the implementation of predictive AI analysis can be attained effectively. The success of predictive AI analysis also significantly relies on the quality and availability of data. This implies that the HR departments need to ensure that data sources available to them are reliable, accurate, and accessible for analysis. This may involve efforts on data cleansing so that inconsistencies or errors may be eliminated while also establishing data governance policies towards maintaining integrity of data (Diaz, et al., 2023; Li, et al., 2023).

Furthermore, HR professionals require the necessary skills and training so that they can effectively utilise the tools of predictive AI analysis in their tasks. It is also important here to implement training programs so that the technical competencies of organisational employees can be enhanced, enabling them to leverage AI technologies to their complete potential. Organisations also need to consider ethical and legal implications while implementing predictive AI analysis in HR. This includes measures such as ensuring transparency, fairness, and accountability in the AI-driven decision-making processes, as well as complying with regulations on data protection and privacy issues (Syed, et al., 2023; Mohammed, 2019; Diaz, et al., 2023; Shams, et al., 2023).

3.3.4 Challenges and Barriers

Predictive AI analysis in HR has certain key challenges and barriers in its implementation. One significant challenge occurs when there is a lack of quality data or insufficient data infrastructure, which can hinder the accuracy and effectiveness of AI algorithms. Additionally, if employees show resistance to change and if HR professionals fail to support the effective adoption, then the implementation of the technologies may not be effective. Furthermore, a key challenge is also that in implementing AI, the ethical and legal compliance factors must be taken into consideration, particularly regarding data privacy and overcoming biases which otherwise can impact the implementations significantly (Varsha, 2023; Navarro, et al., 2021).

Technical complexities, such as integrating AI systems with existing HR software and systems, also prove to be key barriers to the process of implementation. Moreover, the costs associated with acquiring and implementing AI technologies in an organisation are significantly high, which are also associated with key uncertainties such as related to the return on investment. Such challenges can discourage organisations from considering the implementation of predictive AI analysis in HR (Varsha, 2023; Navarro, et al., 2021; Johnk, et al., 2021; Felzmann, et al., 2019).

3.3.5 Opportunities and Benefits

Predictive AI analysis in HR offers key opportunities and benefits for organisations as well. Firstly, it allows organisations and HR professionals to make more informed decisions, as the AI systems can provide key insights into workforce trends, which helps the HR professionals to anticipate future staffing requirements more effectively and hence make the necessary plan accordingly. Predictive AI analysis can also enhance the process of talent acquisition and help an organisation to retain its talented employees by identifying high-performing candidates and predicting risks associated with employee turnover (Mohture, 2023; Albassam, 2023; Rohit & Ajit, 2016).

Moreover, with AI-driven predictive analytics, HR processes, such as performance management and training can effectively be optimised, which in turn leads to increased levels of efficiency and productivity. By leveraging upon AI technologies, HR departments can also personalise the experiences of employees, allowing customisation of employee development plans and career progressions, to individual needs and preferences (Mohture, 2023; Albassam, 2023; Rohit & Ajit, 2016; Gryncewicz, et al., 2023). Based on the above, the first hypothesis will be to test the positive impact of implementing predictive AI analysis in HR on HR effectiveness.

3.4 Application of AI in HR

3.4.1 Definition and Overview

AI solutions are employed in HR to automate and optimise diverse HR procedures. The systems help organisations make better decisions and manage their personnel more effectively. Several major applications are engaged in the implementation of AI in HR, which include recruitment of employees and onboarding, along with their performance management, talent development, and engagement at work (Gabcanova, 2012; Aparanji, 2023). Acquisition of talent and staff recruitment are two important areas where AI is being used in HR. HR professionals can analyse employee resumes, screen candidates, and also conduct initial interviews with the help

of AI-powered tools. This allows HR professionals to complete these activities faster and more affordably, while ensuring that the recruitment and selection process is carried out efficiently. Moreover, AI algorithms have the potential to identify potential biases while conducting evaluations on candidates or job descriptions, which in turn support inclusive hiring practices and diversity in the workplace (Aparanji, 2023; Prasad, et al., 2019).

Another area where AI technologies have a big impact is employee engagement and retention. Artificial intelligence (AI)-driven sentiment analysis systems may track staff opinions and evaluate their work engagement levels. This enables HR departments to proactively handle employee-related issues and maintain employee satisfaction. AI-powered chatbots and virtual assistants also give workers immediate assistance and direction on a range of HR-related questions, which improves workers' experiences at work even more. Additionally, AI algorithms can offer insightful analyses of past data and patterns into talent management strategies, enabling HR managers to make better decisions and optimise their HR operations (Aparanji, 2023; Prasad, et al., 2019; Sheshadri & Palivela, 2023).

3.4.2 Types of AI Applications in HR

In respect of AI applications in HR, significant evolutions have been witnessed leading to increasing transformations in traditional practices driving innovations and efficient operations within an organisation. These AI applications can be broadly categorized into several types that address various aspects of HR functionalities. Applications of AI technologies helps the recruitment process by automating the tasks such as screening of the resumes, and initial assessment of the candidates. AI has the potential to go through vast amounts of applications and identify those candidates who match the job specifications more suitably. This therefore helps in reducing the time as well as biases which are otherwise associated with individuals carry out these processes manually (Kaur, et al., 2023; Ahmed, 2018; Mikalef, et al., 2023).

Tools based on AI such as the sentiment analysis and employee feedback platforms tend to help HR departments to analyse morale and engagement levels of

employees, and their satisfactions in real-time. Predictive analytics can also forecast the risks of employee turnover by identifying patterns and factors that contribute to disengagement of employees. This in turn helps HR professionals to develop targeted interventions to retain top talent. Personalised learning experiences are also made possible through AI, which can assess individual learning needs and styles and help in recommending customised training programs for the employees (Sheshadri & Palivela, 2023; Aparanji, 2023; Dias, et al., 2023).

The AI tools have their implications in performance management as well. AI applications are found to assist in setting and monitoring performance goals, while providing real-time feedback and analytics that help employees and managers to monitor the overall progress in performances. Moreover, with chatbots and virtual assistants that are increasingly used for inquiries and conversations in HR, it is possible for employees to have 24/7 access to key information on policies, benefits, and processes related to the HR functions (Sheshadri & Palivela, 2023; Aparanji, 2023; Dias, et al., 2023; Gabcanova, 2012).

3.4.3 Impact of AI on HR Functions

With AI, it is possible to streamline the process of recruitment, making it more efficient and effective than what can be achieved with human capabilities. Tools that are powered with AI help to automate the screening of resumes, assess how suitable candidates would be for the organisation based on job requirements, and even predict success of candidates in respective roles. This reduces the overall time-to-hire and also improves the quality of the recruits, while also minimising biases as the assessments are based on objective analysis upon data (Soni, 2022; Kumar, et al., 2020; Ganatra & Pangya, 2023).

AI enables a more personalised approach to increasing the levels of engagement of employees. It achieves this by analysing data from across different departments, functions, and factors so that the trends in data can effectively be identified. This also contributes in predicting employee turnover rates, and provide actionable insights for improving the engagement levels of employees. Moreover, AI assists in customising

the learning experiences to individual needs of employees. This results in optimisation of the learning paths for the individuals, while facilitating their skills development as necessary (Malisetty, et al., 2017; Tambe, et al., 2019; Soni, 2022).

AI also contributes in transforming performance management into a more dynamic and continuous process within an organisation. As AI offers real-time feedback and predictive analytics, its tools help HR managers and employees to align more effectively on objectives, track their progress, while also identifying the key areas for development. This in turn helps in enhancing the overall performance and productivity of the employees in an organisation. Moreover, by automating the routine organisational and HR tasks, AI allows the HR professionals to involve themselves more effectively on strategic initiatives of the organisation (Malisetty, et al., 2017; Tambe, et al., 2019; Soni, 2022; Ganatra & Pangya, 2023).

3.4.4 Challenges and Opportunities

The application of AI in HR has both its opportunities as well as challenges for an organisation. It may be noted here that the AI advances are increasingly reshaping how organisations approach with their HR management practices, workforce planning, and employee engagement strategies. The key opportunities that are associated with the AI application in HR include enhanced decision making, gains in efficiency levels, personalised employee experiences, and predictive analytics. AI provides HR professionals with data-driven insights, which enable the HR teams to make more informed and effective decisions in respect of talent acquisition, retention of employees, and employee development plans. As I helps in automating the routine HR tasks, such as screening of resumes and responding to employee queries, these technologies allow the HR professionals to have more time to focus on more strategic priorities of their organisations (Sharma, 2021; Ferris, et al., 2004).

AI also enables customised learning and development programs for employees, which are focused on individual career requirements. These advances also in the process, allow the HR teams to conduct wellness checks on their employees proactively, thus improving the overall employee satisfaction and retention of key

talents. Moreover the ability of AI to forecast future trends helps HR professionals to effectively plan their workforce needs, while identifying potential employee turnover, and preparing for skill gaps, which in turn ensures that the organisation can stay competitive and adaptable in changing business environment (Sharma, 2021; Ferris, et al., 2004; George & Thomas, 2019).

However, there are certain key challenges that are also prevalent with the AI systems, such as related to data privacy and security, biases and ethical concerns, challenges with its integration, and the additional skills that members required to adapt to AI systems. When sensitive data have to be managed, it necessitates the presence of strict control measures, to ensure that there are no breaches on privacy or data relates issues. This therefore results in a challenge for the teams handling the AI implementations and usage. Moreover, with AI, there are chances of biases too, in their evaluations and decision-making processes. Organisations may even experience complexities in implementing the AI systems, which is another key challenge associated with the advances (Palos-Sanchez, et al., 2022; Saxena, 2020; Patel, 2023).

3.4.5 Ethical Considerations

Ethical considerations are crucial in the application of AI systems in HR owing to the potential impact that the systems can have on the opportunities, and rights that individuals can have within the workplace. One primary concern is the risk of biases that are inherent in historical data that are used to develop and apply the AI algorithms. This therefore results in discriminatory outcomes in the HR processes of hiring, promotion, and performance evaluation in an organisation. Thus, there is a need for continuous monitoring to ensure that fairness and equity are achieved, and that the I-based biases may be eliminated (Tuffaha, 2023; Matthew J & Aizenberg, 2022).

Another key ethical consideration is the factor of transparency, which is important because of the individual rights that employees hold, in an organisation. Employees have the right to know the details of technologies and their applications in driving the decisions in HR, which have a direct impact on their roles, performances, and sustenance in an organisation. Thus, it is important for organisations to provide

clear explanations of the processes and results to their employees, if AI is considered, which in turn would ensure enhanced trust and accountability between the employees and the management. Moreover, it is also important to protect the privacy and security of employee data to keep all sensitive information safe that are associated with individual employees, so that they cannot be accessed by unauthorized sources or misused in any way (Tuffaha, 2023; Matthew J & Aizenberg, 2022; Tinguely, et al., 2023). Accordingly, the second hypothesis will test the positive impact of applying AI in HR process on HR effectiveness.

3.5 HR Effectiveness

3.5.1 Definition and Overview

HR effectiveness offers a measure of how successfully the HR function within an organisation is capable of fulfilling its roles and responsibilities in ensuring the achievement of the strategic objectives of the business based on effective management of the employees of the organisation. There are key dimensions that define the concept of HR effectiveness such as recruitment, talent management, performance management, learning and development, employee relations, and legal compliance (Majowska & Austen, 2019; Schuler & Jackson, 2014).

A core function or purpose of the measure of HR effectiveness is to assess how effectively the HR strategies, policies, and practices of an organisation are aligned with the overall goals and values of the organisation. The alignment of the goals ensures that the initiatives in HR are not only focused on the needs of employees but also drive desired levels of performances and outcomes for the business, such as increased levels of productivity, innovation, and profitability (Majowska & Austen, 2019; Schuler & Jackson, 2014).

HR effectiveness can be realised in an organisation based on effective strategic alignment of goals, through efficiency levels and effectiveness of HR processes, through talent management functions, through enhanced engagement levels of employees as well as employee satisfaction levels, and through management of risks

and legal compliances (Majowska & Austen, 2019). Here, it may be noted that it is important for organisational HR initiatives to align effectively with organisational strategies and goals to ensure that the workforce planning and employee management efforts can match with the desired levels of performances. When the HR processes are efficient and effectively streamlined, they allow more effective and timely delivery of services. Thus HR teams need to work on their effectiveness to ensure that they can rightly attract and retain their talented employees for long (Alami, et al., 2015; Shehada & Alkhaldi, 2015).

3.5.2 Factors Affecting HR Effectiveness

The effectiveness of HR in an organisation is influenced by a number of factors, which affects the capacity of the organisation to support its strategic objectives and enhance the overall success of the business. Support from the leadership, HR strategy, organisational culture, HR technology and systems, employee relations, HR rules, and the external environment of the organisation are a few of the crucial elements that impact the HR effectiveness within a workplace.

For HR to be effective in a business, it is important for its senior leadership provide a strong support. It is evident that organisational leaders who prioritise HR projects and actively engage with HR experts uphold the significance of HR functions and guarantee their correspondence with the organisation's principal goals and objectives. The importance of an organisation's HR goals aligning with its overall goals and strategies is thus crucial (Okolie, et al., 2021; Mammadova, 2019).

HR effectiveness is also significantly influenced by the factor of organisational culture. A company needs to have a culture that values employee development, collaboration, and innovation in order for HR procedures to be successful and long-lasting. The culture must also be able to provide an encouraging environment for HR practices to flourish. Consequently, this enhances the overall effectiveness and productivity levels of the organisation. Furthermore, as HR technology and systems have the ability to improve employee satisfaction and HR operations overall, their

efficacy and availability inside an organisation also play a major role in HR effectiveness (Okolie, et al., 2021; Mammadova, 2019; Pawar, 2018).

The effectiveness of HR in an organisation also depends on positive employee relations such as driven by effective communication, conflict resolutions, and positive treatment of all employees at work. Moreover, well-defined policies in HR and streamlined processes are essential for HR effectiveness, as with clear policies it is possible to ensure that the HR practices are consistent, fair, and efficient in their service delivery. External factors such as legal and regulatory requirements, or labour market conditions, and industry trends that are experienced by a business, also impact the effectiveness of HR in an organisation, and hence it is important for the HR professionals to stay updated about external developments and adapt their HR practices accordingly (Maheshwari, et al., 2020; Samwel, 2018; Genc, 2014).

3.5.3 Measurement of HR Effectiveness

The measurement of HR effectiveness involves assessment of the impact and contribution of HR initiatives and practices on organizational goals and objectives. In the process, key performance indicators (KPIs) are required to be identified that reflect the outcomes and value of HR activities in driving success in a business. HR Metrics include quantitative measures such as measurements of the rates of employee, scores on employee engagement, vacancies and their filling times, hours of training per employee, and budget allocation in HR. It is feasible to learn more about many facets of HR effectiveness and performance by using these measures (Gabcanova, 2012; Aparanji, 2023).

Another technique for getting employee input on a range of HR-related topics, such as how satisfied they are with HR services, how they view the culture of the company, and how successful HR policies and procedures are, is to administer surveys. The results from employee survey provide valuable insights into both the positive areas of the HR functions as well as those wherein key improvements are necessary. Further, the measure of the performance management systems allows the HR professionals to

determine performance of individuals and teams compared against predetermined goals and objectives (Setiawan & Purba, 2020; Ulhaq & Febriansyah, 2023).

By assessing the alignment between employee performance and organizational objectives, HR can measure the effectiveness of performance management processes in driving success of the organisation. Another measure is possible through the ROI analysis, which evaluates the financial impact of HR initiatives. By comparing the costs of HR programs to the outcomes achieved (e.g., increased productivity, reduced turnover), organisations can assess the effectiveness and value generated by HR activities. Also, benchmarking involves comparing the metrics of HR performance and practices against industry standards, which helps organisations to identify areas of improvement for HR effectiveness (Setiawan & Purba, 2020; Ulhaq & Febriansyah, 2023; Gabcanova, 2012; Bhatti, et al., 2014).

3.5.4 Importance in Public Sector Organisations

Public sector organisations have a key responsibility to address and fulfil the needs of the public such as in respect of basic infrastructure, healthcare services, educational facilities, and overall public safety. Considering that in fulfilling these needs, the public sector organisations need their employees to be efficient and effective in their actions, hence effectiveness of HR practices is crucial for such organisation. Here, it may be noted that the public sector organisations are benefitted by effective HR practices to achieve enhanced levels of productivity, creativity, and quality of services, supported by attracting and retaining key talents in the workplaces. The role of the HR here may be realised as crucial in helping employees to develop their abilities, and supporting a happy work environment (Forstenlechner, et al., 2012; Sarker & Rahman, 2020).

For those involved in serving the interest of the public, a positive employee morale has been realised as essential to ensure that they are effectively aligned with the objectives of the organisation and hence strongly dedicated towards achieving effective practices in HR. In HR, this is possible to be attained through employee engagement initiatives, employee recognition programmes, and professional development

opportunities being offered to employees. In this context, it has also been realised that maintaining ethical standards and guaranteeing accountability within public sector organisations significantly depend on the efficacy of HR (Al Awadhi & Muslim, 2023; Fahim, 2018).

HR regulations and processes also support fairness and transparency in decision-making, hold leaders and employees accountable for their actions, and help to avoid wrongdoing inside a company. Effective HR practices help government organisations to gain and maintain the confidence of the general public. People are more inclined to believe that the government can accomplish its duties and act in the public interest when public sector organisations exhibit competency, fairness, and responsiveness in their HR procedures (Al Awadhi & Muslim, 2023; Fahim, 2018; Forstenlechner, et al., 2012).

3.5.5 Linkage with Predictive AI Analysis and AI-Measured KPIs

Predictive AI analysis and AI-Measured KPIs are related to HR effectiveness since they can improve HR procedures and results.

HR professionals may predict future workforce trends, identify possible risk factors, and make data-driven decisions that support organisational objectives with the help of predictive AI analysis. HR may monitor and evaluate KPIs in real-time based on AI applications, thus enabling preventive changes and continuous improvement activities, by utilising AI-measured KPIs. When combined, these AI solutions offer HR insightful information and predictive power that boosts overall performance and drives success in business through strategic workforce planning, enhanced employee engagement, and optimised personnel management (Mohture, 2023; Albassam, 2023; Mikalef & Gupta, 2021).

3.6 Mediating Variables

3.6.1 Implementation Efficiency

3.6.1.1 Definition and Overview

As a mediating variable, implementation efficiency describes how well and quickly AI technologies – like AI-measured KPIs and predictive AI analysis – are operationalised and incorporated into the HR department of an organisation. It includes the effectiveness of the methods, tools, and techniques applied to successfully carry out AI projects. A high degree of implementation efficiency signifies a quick and seamless integration of AI technology with little interference with ongoing HR processes (Sheshadri & Palivela, 2023).

This includes elements such as the efficacy of change management techniques, the clarity of implementation plans, and the accessibility of sufficient resources (such as technology infrastructure and qualified labour). The association between AI adoption and HR effectiveness is mediate by implementation efficiency, since firms with higher implementation efficiency are more likely to gain from AI technologies in the form of better HR procedures, more efficient operations, and increased organisational performance. On the other hand, inefficient implementation can prevent AI from reaching its full potential as well, which would result in less than ideal results and a slower pace of achieving HR goals (Sheshadri & Palivela, 2023; Prakash, 2019).

3.6.1.2 Role in Predictive AI Analysis and AI Applications

For predictive AI analysis and other AI applications to be successfully deployed and used in the HR area of businesses, implementation efficiency is essential. It highlights on how quickly and effectively these AI technologies can be incorporated into the current HR procedures and systems. Implementation efficiency in the context of predictive AI analysis makes sure that procedures for data gathering, model creation, and deployment are carried out quickly and efficiently. This involves employing resources – such as data infrastructure and analytical knowledge – efficiently in order

to extract insightful conclusions and forecasts from HR data (Sheshadri & Palivela, 2023; Prakash, 2019; Mikalef & Gupta, 2021)..

Similar to this, implementation efficiency in AI applications for KPIs guarantees that the systems and tools required to gather, process, and display KPI data are used efficiently. This enables HR professionals to make wise decisions by gaining real-time information into the functioning of the organisation. The acceptance and utilisation of AI applications in HR, such as predictive analytics, are generally accelerated by the factor of implementation efficiency. This results in better decision-making, improved operational effectiveness, and ultimately, increased HR effectiveness inside organisations. Effective implementation procedures make it easier for AI technologies to be seamlessly included into HR procedures, maximising their potential to promote organisational success (Sheshadri & Palivela, 2023; Prakash, 2019; Mikalef & Gupta, 2021).

3.6.1.3 Factors Influencing Implementation Efficiency

The efficacy and speed at which the AI technologies are embraced and operationalised inside the HR function in an organisation is referred to as implementation efficiency when considering the integration of predictive AI analysis and AI applications into HR operations. It includes the effectiveness of the methods, materials, and techniques employed to successfully carry out AI projects (Sheshadri & Palivela, 2023; Prakash, 2019; Mikalef & Gupta, 2021)..

Efficiency of implementation is influenced by several aspects. The effective application of AI technology in HR is facilitated by well-defined goals, objectives, and implementation strategies.

Thus, for implementation to be successful, adequate funding, technological infrastructure, and qualified staff must be allocated. Stakeholder involvement, communication, and training are all effective change management techniques that assist in reducing opposition and promoting the seamless implementation of AI technologies (Mikalef & Gupta, 2021).

In order to successfully adopt AI technologies and overcome implementation issues, it is imperative to have access to technical expertise and support. For AI projects to be successful, high-quality and easily accessible data is necessary. Ensuring data quality and availability advances the deployment processes and enhances the accuracy of AI-driven insights. An atmosphere that is favourable to the effective application of AI technology in HR is created by a culture that values creativity, cooperation, and constant progress (Sheshadri & Palivela, 2023; Prakash, 2019; Mikalef & Gupta, 2021).

3.6.1.4 Implications for HR Effectiveness

Implementation efficiency is found to have direct impacts on HR effectiveness as it influences the speed, quality, and success of integrating AI technologies into HR processes. Efficient implementation ensures that the tools of AI, such as predictive AI analysis and AI-measured KPIs, are smoothly and effectively deployed, which in turn helps to minimise any disruptions that may occur to HR operations. This allows HR professionals to effectively leverage the capabilities of AI to consider decisions based on data, optimise workforce planning, and enhance the overall experiences of employees (Sheshadri & Palivela, 2023).

Moreover, efficient implementation facilitates timely access to AI-driven insights, which in turn enables HR to address organisational challenges more proactively, while also capitalising on emerging opportunities. Eventually, by enhancing the speed and effectiveness of adoption of the AI systems, the factor of implementation efficiency directly contributes to improved HR effectiveness, driving organisational success and competitiveness in the contemporary business performance (Sheshadri & Palivela, 2023; Prakash, 2019; Mikalef & Gupta, 2021).

Therefore, the next hypotheses will examine how implementation efficiency mediates the relationship between implementation of predictive AI analysis as well as application of AI in HR process and HR effectiveness.

3.6.2 Employee Readiness

3.6.2.1 Definition and Overview

The desire and ability of employees within an organisation to accept and adjust to changes is referred to as employee readiness. In the current context, this is being focused particularly on respect of integrating predictive AI analysis and AI applications within HR processes. It involves aspects such as skills of employees, their understanding of AI technologies, and their attitudes towards innovation and change. A high degree of employee readiness is evident when a workforce is found to possess or develops the necessary competencies to work effectively with the tools of AI (Ezzaim, et al., 2023).

It may be noted here that employee readiness significantly influences the effectiveness of implementing AI in HR. When employees are ready, they are more likely to engage with new technologies, participate in the required training programs, and apply AI-driven insights in their work. This proactive engagement can lead to more effective transitions, faster rates of adoption, and more effective utilisation of the AI systems to achieve objectives in HR. On the other hand, low employee readiness can pose major challenges to AI implementation, thus resulting in resistance to change and underutilisation of AI capabilities, which can impact HR effectiveness negatively then (Ezzaim, et al., 2023).

3.6.2.2 Importance in AI Adoption

The effective integration of AI in organisations, especially in the HR domain, is dependent upon the factor of employee readiness. It represents the general readiness of the workforce, their receptivity, and capacity to interact with and make good use of the AI technologies. This preparedness is essential because the deployment of AI requires substantial adjustments to organisational culture, workflows, and roles of the personnel in addition to changes in technology (Ezzaim, et al., 2023).

Employee preparedness for AI adoption is critical since it directly affects how well these technologies are incorporated into regular business processes and key HR

responsibilities. An agile attitude, a culture of lifelong learning, and a solid foundation in digital literacy define a workforce that is well-prepared for AI. Employees need these qualities in order to successfully navigate the complexities of AI tools, comprehend their advantages, and use them to improve productivity, decision-making, and overall HR efficacy (Ezzaim, et al., 2023; Joshi, 2023).

Organisations may fully utilise AI when employees are ready and willing to adopt the technology, which result in creative HR procedures, better decision-making, and enhanced organisational outcomes. On the other hand, a lack of staff preparation can hinder the adoption of new technology, hinder the application of AI, and reduce its potential benefits, highlighting how important it is to create an AI-ready culture (Ezzaim, et al., 2023; Joshi, 2023).

3.6.2.3 Factors Influencing Employee Readiness

There are several factors that impact how willing and ready employees are to accept new technologies and approaches. These elements are essential for enabling a seamless shift to AI-driven procedures and guaranteeing that workers can use AI tools to enhance productivity and make better decisions. Employee comfort and familiarity with digital tools and technology has a big influence on how prepared they are to adopt AI. More preparedness is correlated with higher digital literacy. By interpreting technology and fostering competence, access to thorough training and educational materials on AI applications and their advantages improves employee readiness. Employees are more likely to adopt AI and other future technologies in a workplace where creativity, continual learning, and adaptability are valued (Joshi, 2023; Rajeshwari, et al., 2023).

Employee expectations can be managed and change resistance can be decreased with the aid of effective change management techniques, which include clear communication, leadership support, involvement, and assistance. Employee adoption of new technologies can be influenced by their understanding of how AI might improve their work and support organisational goals.

Organisations may achieve improved HR performance and facilitate a more seamless integration of AI into HR operations by addressing these factors and improving employee preparedness for AI adoption (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

3.6.2.4 Impact on HR Effectiveness

Key impacts are felt on HR effectiveness, by the factor of employee readiness, considering their role in accepting the integration and use of AI in the HR processes. Since employee readiness implies the level of their preparedness and willingness to accept the AI systems and their utilisation, hence this factor determines how effectively AI may be implemented and used in the HR related activities. When a workforce is ready and willing to accept and use the AI systems effectively, then it can be expected that the use of AI in routine tasks can be achieved more effectively, while also having its key implications in the decision-making processes. This in turn can improve the adoption of the AI systems and make optimal use of its benefits as reflected in enhanced decision making, improved data analysis, and more efficient HR practices. The higher the proficiency levels that employees may gain with AI tools, the higher is the level of effectiveness that may be achieved by the HR departments to fulfil the strategic goals of the organisation (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

On the other hand, if the employee readiness is not adequate, then it may negatively impact the integration of AI technologies, which in turn may result in negative impacts on the overall effectiveness of the HR systems as the available resources would not be affected utilised then. Encouraging employee readiness is therefore essential to realise the complete benefits offered by AI systems in HR and resulting in more strategic, data-driven, and effective HR procedures that allow the organisational objectives to be fulfilled (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

To this extent, the hypothesis will study how employee readiness mediates the relationship between implementation of predictive AI analysis as well as application of AI in HR process and HR effectiveness.

3.7 Conceptual Framework Development

3.7.1 Overview of the Proposed Conceptual Framework

Understanding the dynamics between the implementation of advanced AI technologies in HR, the resulting HR effectiveness, and the role of mediating variables such as implementation efficiency and employee readiness forms the basis of the proposed conceptual framework for examining the impact of predictive AI analysis and AI-measured KPIs on HR effectiveness in the UAE public sector organisations, which is the particular context of this research. This approach considers the crucial elements that affect the success of such technological adoption and aims to clarify how the strategic integration of AI into HR processes can change HR operations, improve decision-making, and strengthen the overall performance of the organisations.

The study has two independent variables – the application of AI and the implementation of predictive AI analysis in HR – which form the foundational basis of this research. Predictive AI analysis allows HR managers within an organisation to make proactive decisions based on analysis of existing data and patterns to forecast future HR demands and outcomes. The application of AI, on the other hand, implies the broader use of AI technologies for a variety of HR functions, such as in hiring, performance management, and employee engagement activities (Rustagi & Goel, 2022; How, et al., 2020; Gabcanova, 2012).

These independent variables are believed to have a direct impact on the dependent variable in this study, which is the factor of HR effectiveness. The degree to which HR operations can fulfil the organisational goals, improve satisfaction levels of employees, and support the overall performance of an organisation, is implied by the factor of HR effectiveness. Two mediating variables – implementation efficiency and employee readiness – are also integrated into the framework. The effectiveness and speed with which AI technologies are embraced and operationalised inside the HR

department is realised by the factor of implementation efficiency. It includes aspects such as how well-resourced, how well-planned the implementation strategies are, and how successful the change management techniques are that are considered by the HR professionals in the organisations.

On another hand, employee readiness refers to how ready and eager the HR division and the larger workforce are to adopt the AI technologies (Sheshadri & Palivela, 2023; Prakash, 2019; Ezzaim, et al., 2023).

According to the conceptual framework, HR effectiveness may be significantly influenced by implementing predictive AI analysis and using AI more broadly, but the degree of these advantages may further be influenced by how well the process is handled and how willingly staff members are ready to accept the new tools. It is thus predicted that high implementation efficiency and favourable staff readiness will enhance the beneficial effects of AI on HR effectiveness, whereas low efficiency and readiness may reduce the expected advantages. This framework offers a thorough foundation for examining the revolutionary potential of AI in the HR function of public sector organisations in the United Arab Emirates. It emphasises the significance of organisational and human factors in addition to technological capabilities that impact the effective adoption and application of AI in enhancing HR effectiveness.

3.7.2 Relationship between Variables

A more complex comprehension of how AI technologies can change HR functions is provided by the relationship between the independent, dependent, and mediating variables within the framework of this proposed study on the effect of predictive AI analysis and AI-measured KPIs on HR effectiveness in UAE public sector organisations. This investigation is predicated on the idea that although integrating AI into HR (independent variables) should increase HR effectiveness (dependent variable), employee readiness and implementation efficiency have a major impact on how much these factors impact the relations.

The application of AI and the implementation of predictive AI analysis in HR are the independent variables of the study, and they are essential to understand as to

how contemporary technologies may be effectively incorporated into HR procedures. Predictive analytics can be used to create proactive workforce planning, talent management, and other crucial HR strategies by using AI to forecast future HR events and requests (Rustagi & Goel, 2022; How, et al., 2020; Gabcanova, 2012). More broadly, applying AI means utilising AI tools for various HR tasks such as recruiting, onboarding, employee engagement, performance evaluations, and retention strategies, having key implications to improve these processes significantly.

Through the automation of repetitive tasks, enhancement of decision-making procedures, and provision of data-driven insights, these technologies have the capacity to revolutionise the organisational HR practices (Rustagi & Goel, 2022; How, et al., 2020; Gabcanova, 2012; Li & Fox, 2023).

The outcome of incorporating AI into HR operations is reflected in the dependent variable of HR effectiveness. Many factors are considered when examining it, including the efficiency of the hiring procedures, rates of employee retention, levels of employee satisfaction, and the general alignment of HR practices with the major goals of a corporation. The ability of an organization's HR department to best utilise its technology and human resources to maximise their contribution to the accomplishment of organisational objectives is reflected in the factor of HR effectiveness. An increase in HR effectiveness is anticipated in the context of this study as a direct outcome of the thorough integration of AI technology and predictive analytics into HR procedures (Setiawan & Purba, 2020; Ulhaq & Febriansyah, 2023; Bhatti, et al., 2014; Gabcanova, 2012).

The two mediating variables that this study has aimed to analyse are the – implementation efficiency, and employee readiness – towards determining how these two factors can further influence or impact the relationship between the independent variables on the factor of HR effectiveness. Implementation efficiency implies the analysis on how well the AI technologies are implemented within the HR processes in an organisation. This includes the speed and accuracy of the implementation of the systems, the adequacy of the available resources that are allocated, the clarity and execution of the plan of the implementation, and the effectiveness of the change management strategies as well which may be realised as necessary to support the

changes that are required while implementing the AI systems in existing processes. A high level of implementation efficiency is expected to enhance the positive impact of AI on HR effectiveness by ensuring that the technologies are utilised to their complete potential and capacities, and hence would also accelerate the realisation of the key features and aspects of AI such as improved decision-making, efficiency, and improved levels of employee engagement (Sheshadri & Palivela, 2023; Prakash, 2019; Ezzaim, et al., 2023).

Employee readiness represents the preparedness and willingness of organisational employees to adapt to and embrace AI technologies. This includes factors such as the digital literacy as held by the employees, their attitudes towards necessary change processes to support the AI systems, and their perception of the benefits of AI integration in their HR systems and decisions. Here it may be noted that the factor of employee readiness is crucial because, irrespective of the technological superiority of the AI tools, the ultimate utility and impact of these technologies on HR effectiveness significantly depend upon the willingness of the organisational employees and their ability to effectively engage with such advances so that their utilisation can be effective and optimal for the team. Thus, a workforce that is ready for AI systems is more likely to advance the process of AI adoption, reduce the chances of resistance, and enable the full capabilities of AI to be utilised towards enhancing the practices in HR (Sheshadri & Palivela, 2023; Prakash, 2019; Ezzaim, et al., 2023).

In respect of the interplay or interconnections between these variables as considered for this study, it may be noted that the interrelations offer a complex yet comprehensible description on how the AI applications in HR can prove to be transformative for the organisations. While the independent variables (Implementation of Predictive AI Analysis and Application of AI) are hypothesised to have direct impacts on the factor of HR effectiveness (dependent variable of the study); it is also highlighted as to how the strength and direction of this relationship can significantly be mediated by the factors of implementation efficiency and employee readiness (which are the mediating variables considered for the study). For instance, even if an organisation integrates the most advanced AI tools within its HR processes, the enhancement in HR effectiveness that may be expected, might not be fully attained if

the implementation process is inefficient or if the employees are resistant or unprepared for the change.

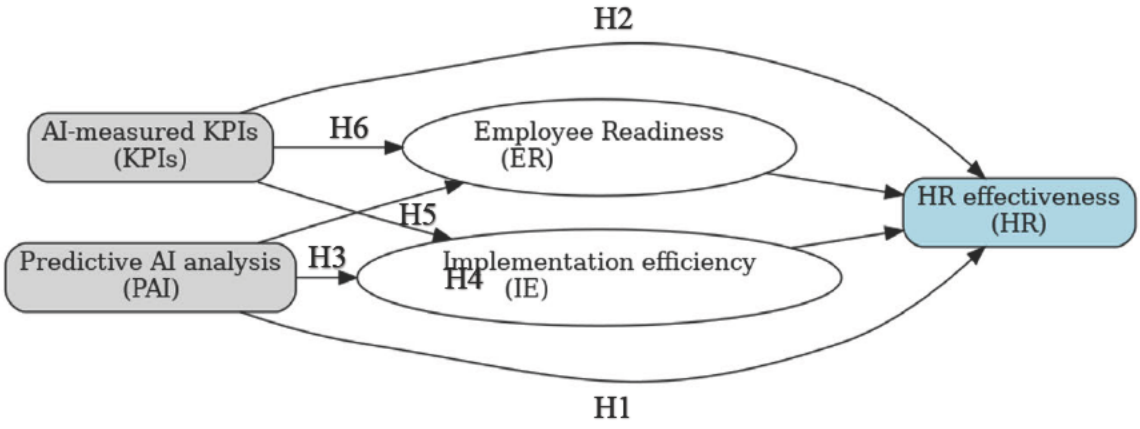
This therefore suggests that the effects of the predictive AI analysis implementation or application of AI in HR on HR effectiveness, would further be dependent on whether the employees are ready for the changes, and if the processes of AI implementation are achieved effectively.

Thus, while analysing the relationship between the independent and dependent variables may be realised as crucial, similarly it is important to understand the roles played by these two mediating variables as well. This complex framework essentially suggests that the effective use of AI technologies in HR, which results in increased HR effectiveness, is strongly related to how these technologies are adopted and deployed within an organisation. This all-inclusive strategy emphasises how crucial it is to consider both the factors of technology and human elements in order to maximise the benefits of AI for HR performance.

3.7.3 Diagrammatic Representation of the Conceptual Framework

The following is a diagrammatic representation of the conceptual framework that has been developed for the study.

Figure (3- 1): Conceptual Framework of the Study



Sources: developed by author

The conceptual framework illustrated in Figure (3-1) was developed using SmartPLS and visually represents the relationships among the key variables of this study. As shown, the independent variables consist of the Implementation of Predictive AI Analysis (PAI) and the Application of AI-Measured HR KPIs (KPIs). These variables are hypothesized to directly influence the dependent variable, HR Effectiveness (HR).

Additionally, two mediationg variables – Implementation Efficiency (IE) and Employee Readiness (ER) – are incorporated into the framework. These mediators are expected to affect the strength and direction of the relationships between the independent and dependent variables. Specifically, the model tests whether higher levels of efficiency in implementation and readiness among employees enhance or alter the impact of predictive AI and KPI applications on HR effectiveness. This framework therefore provides the basis for the study's hypotheses testing, guiding the analysis of both direct and mediated relationships among the variables under investigation.

3.8 List of Hypotheses

The following are the hypotheses that are developed based on the conceptual framework of the research and would be tested in the research.

Table (3- 1): List of hypotheses

Hypothesis	Statement	Expected Relationship
H 1	Implementation of Predictive AI Analysis in HR positively impacts HR effectiveness	Positive direct effect
H 2	Application of AI-measured KPIs in HR processes positively impacts HR effectiveness	Positive direct effect

H 3	Implementation efficiency mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness	Mediation effect
H 4	Implementation efficiency mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness	Mediation effect
H 5	Employee readiness mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness	Mediation effect
H 6	Employee readiness mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness	Mediation effect

Sources: developed by the authors

3.9 Summary

The conceptual framework of the current study integrates a comprehensive approach to understand how technical advances in AI might revolutionise HR practices within an organisation. The implementation of predictive AI analysis in HR and the application of AI are the two independent variables of the study, wherein the factor of HR effectiveness is the dependent variable of the research. Two mediationg variables (implementation efficiency and employee readiness) have also been considered in the study to determine their impacts on the relationship between the independent and dependent variables of the study.

By forecasting future HR needs and trends, predictive AI analysis in HR can improve the ability of the HR teams in organisations, to make more effective decisions by leveraging AI tools and systems, which support the key HR operations linked to forecasting and strategic planning of a business. HR effectiveness is determined by how well the processes of HR can enhance the overall satisfaction levels of employees,

fulfil the organisational goals, and support the primary strategic objectives of the business. It is expected here that the integration of AI technologies can directly affect the performance of HR in an organisation by streamlining procedures, improving decision accuracy, and creating a more motivated and effective workforce.

The effectiveness of the AI implementation process including its speed, resource allocation, and change management techniques, is addressed by the factor of implementation efficiency, which is one of the two mediationg variables considered for analysis in the study. The ability and willingness of the workforce to accept and modify AI technologies is referred to as employee readiness, which is the other mediationg variable considered in this study. The conceptual framework as has been developed for the study, emphasises that although AI applications and predictive analysis have the potential to greatly improve HR effectiveness, their realisation depends on how well the implementation process is handled and how willingly employees accept these changes.

Chapter 4: Methodology

4.1 Introduction

Significant transformations and major changes have resulted from the evolution of technology in the field of human resources management (HRM). These developments have been supported and enhanced by innovations like predictive artificial intelligence (AI) and AI-measured key performance indicators (KPIs). With the advent of innovative approaches and measurements that offer the potential to assess and improve overall organisational performance, these technological advancements are evolving and transforming the realm of HRM as it exists currently.

In the context of the UAE public sector, this specific study has concentrated on evaluating the possible advantages and difficulties of incorporating AI-measured KPIs and predictive AI into HR processes. This chapter provides a comprehensive overview of the research methodology has been presented, as has been employed in this study. It provides the details the philosophical underpinnings, research design, data collection methods, sampling strategy, and analytical techniques that have been used to investigate the impact of predictive AI and AI-measured KPIs on HR activities within the UAE public sector. The methodology has been designed to ensure the reliability and validity of the findings, thereby enabling the study to make a significant contribution to the academic and practical understanding of AI in HRM.

4.2 Research Philosophy

Research philosophy determines the basis of the ontological and epistemological aspects of the methodological decisions that are made. Instead of offering a highly philosophical exposition, this section concentrates on the most suitable philosophical orientation to explore the causal relationship as put forward in this study.

Positivism, interpretivism, critical realism, postmodernism, and pragmatism are research philosophies that have been widely used in social sciences (Bergmann, 2023). Each of them has variations in terms of assumptions about reality and knowledge

production. Nevertheless, the choice of a philosophical position should be consistent with the research purposes, design, and analytical methodology of the research.

This study follows a positivist philosophy. Positivism presupposes the objectivity, measurability, and invariance of reality to the researcher and the opportunity to study the relationships between variables by using empirical observations and statistical tests (Park et al., 2020). The present research aims at proving the hypothesis of causal links between predictive AI analysis, KPIs assessed by AI, and implementation efficiency, as well as staff preparedness and HR efficacy. The nature of such objectives involves the quantifiable measurement of constructs and hypothesis testing of the form of structured statistical methods.

The alternative philosophies were taken into consideration and were not as aligned with the study design. Supposedly, more suitable to investigate employee perceptions in depth with the help of qualitative inquiry would be interpretivism that focuses on subjective meaning and social construction (Junjie and Yingxin, 2022). The current study, however, does not seek to create interpretive narratives, but the study seeks to test a theoretically based mediation model.

Critical realism is a more objective and less contextual approach to interpretation (Zhang, 2023); still, mixed-methods research designs that seek to reveal more generative processes are generally supported by critical realism. The existing research gives precedence to statistical modelling of observable constructs over multi-layered ontological analysis, although this is relevant conceptually.

Pragmatism enables flexibility in methodology (Kaushik and Walsh, 2019), but the methodological pluralism is not necessary in this study because the desired results are clearly in line with the quantitative explanatory study design. The approach of postmodernism to reject universal truth (Sudartini, 2024) is inconsistent with the aim of the study, which is to formulate generalizable causals. The positivist position is hence suitable since:

1. The research is done to test a set of predetermined hypotheses (H1-H6).
2. Measurable survey indicators are used to construct.
3. The study focuses on cause-and-effect relationships.

4. In evaluating the direct and mediating effects, statistical modelling (PLS-SEM) is used.

The positivist orientation is further supported by the fact that the method of testing structural relationships between latent variables and the determination of mediation effects is possible with the help of Partial Least Squares Structural Equation Modelling (PLS-SEM). The cognitive approach presupposes quantifiable constructs and objective relationships that are calculable and can be statistically proved.

Through the positivist approach, the research guarantees objectivity, replicability, and empirical rigor of the research in determining the influence of predictive AI analysis and AI-measured KPIs on HR efficiency in the organizations of the UAE public sector. Simultaneously, the recognition of the other philosophical approaches proves the level of methodological attentiveness and supports the appropriateness of the need to adopt the quantitative explanatory design as an effective method to realize the research goals..

4.3 Research Design

There are three key research designs applicable in a study – qualitative, quantitative, and mixed-methodology. The three research methods have been reviewed and analysed to determine the most suitable design and methodology for the study.

- **Qualitative research design**

A qualitative research design is a methodological approach that is used for investigating and comprehending complicated events, experiences, or behaviours from the viewpoint and experiences of human beings. Understanding the context and meaning of human interactions and their actions is the key focus of qualitative research (Ugwu & Eze Val, 2023). In-depth insights into social, cultural, or psychological phenomena are frequently obtained using this methodology, which are otherwise difficult to quantify or measure. Investigating the "how" and "why" of specific

phenomena is the main objective of the qualitative research, instead of focusing on "what" or "how much" (Ugwu & Eze Val, 2023; Busetto, et al., 2020).

By adopting this research design, it is possible for researchers to comprehend the individualised experiences, motives, and viewpoints of people or groups. Participant observation, focus groups, in-depth interviews, and content analysis are some of the most frequently used methods to accomplish the data collection for this research design (Ugwu & Eze Val, 2023). With the use of these techniques, researchers are able to accumulate exhaustive, and rich data that can offer a thorough understanding of the research topic. When an investigation on a subject involves researching on complicated, dependent upon context, or unpredictable events that are insufficiently understood, the qualitative research design proves to be highly significant (Tomaszewski, et al., 2020).

It is frequently used to generate theories or hypotheses in the early phases of research so that they can be subsequently tested with quantitative techniques (Tomaszewski, et al., 2020). This strategy is also helpful in disciplines where understanding personal experiences, cultural norms, and the social interactions of individuals or communities is the main goal, such as in sociology, anthropology, psychology, education, and health sciences. It works especially well for researching phenomena like attitudes, emotions, and social interactions that are generally difficult to quantify or measure. However, qualitative research also has its major limitations. The results of such research are frequently specific to the contexts of the research and could be difficult to generalise to broader demographics.

The research method can also take a lot of time as it involves gathering and analysing a significant amount of data and frequently necessitates close participation from individuals as well (Ugwu & Eze Val, 2023; Tomaszewski, et al., 2020; Busetto, et al., 2020).

- **Quantitative research design**

The quantitative research design is a methodological technique that emphasises on gathering and analysing numerical data in order to measure research variables, test

the research hypotheses, and identify patterns or relationships between the variables of a study (Ghanad, 2023). It is distinguished by its focus on accuracy, impartiality, and consistency, and it frequently makes use of organised instruments such as experiments, surveys, and statistical analysis, which enhances the reliability and validity of the research findings. Quantitative research aims to quantify the collected information and generalise the findings of the study, based on data collected from a sample to a broader population (Barella, et al., 2024).

Constructing a research topic or hypothesis based on the generally accepted theories is usually the first step in the process of developing a quantitative research design. Following that, the researcher chooses which variables have to be examined and how to assess them (Barroga, et al., 2023). Standardised and highly structured data collection techniques are used in this methodology to guarantee dependability and consistency of the findings. Methods such as standardised assessments, observational checklists, and questionnaires with closed-ended questions are commonly used for the purpose. Once the data collection is complete, statistical analysis is performed on the data, which can involve basic descriptive statistics or more sophisticated inferential methods such as regression analysis or hypothesis testing (Ghanad, 2023; Barella, et al., 2024).

When the aim of a study is to test hypotheses, demonstrate the cause-and-effect correlations between variables, or forecast future outcomes, in such cases, the quantitative research design proves to be particularly helpful. It is frequently applied in areas wherein the identification of trends, evaluation of the effectiveness of interventions, or assessment of the degree of correlations between variables are the main objectives that are focused, such as in psychology, economics, education, health sciences, and marketing (Barroga, et al., 2023; Barella, et al., 2024).

As it utilises large, representative samples and statistical analysis to allow researchers to form more comprehensive findings, this approach is also recognised for its capacity to yield results that can be generalised to larger populations. Furthermore, the great degree of objectivity and precision that is offered by quantitative research reduces the possibility of bias in the collection and analysis of data (Barella, et al., 2024). However, this research design also has its limitations. As it frequently simplifies

occurrences and human experiences to numerical values, it may ignore the depth and complexity of such individual experiences. Furthermore, it might not be appropriate for investigating new or unexplored topics when there is a lack of theory or information at the moment (Barroga, et al., 2023). The key differences between the qualitative and quantitative research have been tabulated as follows:

Table (4- 1): Differences between qualitative and quantitative research

Factors	Qualitative Research	Quantitative Research
Purpose	To quantify data and generalise the outcomes based on target populations	To explore deep insights, and understanding the perspectives of research participants
Type of data	Numerical and statistical	Non-numerical, descriptive and narrative
Nature of the study	Objective, structured, and driven by hypotheses	Subjective, exploratory, and flexible
Collection of data	Through methods such as surveys, experiments, and structured interviews	Through methods such as unstructured interviews, focus groups, observations
Sample size	Large and representative of the target population	Small and purposive
Data analysis	Use of statistical analysis such as correlation and regression	Methods such as thematic analysis, content analysis, and discourse analysis
Results	Generalizable findings, and predictions	Rich, in-depth understanding, with contextual insights

Sources: developed by the authors

- **Mixed methodology design**

A mixed methods research design is a methodology that combines both the qualitative and quantitative research approaches, to provide a more thorough understanding of a research problem (Doyle, et al., 2009).

Mixed methods research combines the strongest aspects of both the methodologies to provide quantifiable and broadly applicable conclusions obtained from quantitative data as well as the contextual insights from qualitative data which therefore enable researchers to investigate complicated phenomena at a deeper level. This approach is especially useful when there are research problems that cannot be adequately addressed by a single method (Doyle, et al., 2009; Dawadi, et al., 2021).

Researchers usually begin by determining the research questions or objectives that are necessary for both the qualitative and quantitative investigation when using a mixed methods methodology. There are two ways that the research can be carried out in this case – first is concurrently, in which both methods are carried out simultaneously and the data is integrated during the analysis phase, and second is sequentially, in which one method is carried out after the other (for example, a qualitative study is done to explore a topic followed by a quantitative study to test specific hypotheses). The objectives of the study and the type of issue being investigated tend to determine which order would be most appropriate for research (Dawadi, et al., 2021).

A mixed methods research design can be especially helpful when a research subject is complex and requires a variety of data sources to be fully addressed. It is frequently applied in areas where complex human interactions and behaviours are examined, including business, social sciences, healthcare, and education (Dawadi, et al., 2021). This strategy works effectively for interdisciplinary research as well, since a thorough understanding of the research subject requires the integration of several viewpoints and methodologies. On the other hand, in comparison to utilising a single method, mixed methods research might be more intricate and time-consuming. To guarantee that the qualitative and quantitative aspects are successfully combined and

that the results from each strategy strengthen and supplement one another, careful consideration is necessary (Sharma, et al., 2023).

Research Design Chosen for the Current Research

For the current research, the quantitative research design has been employed. Considering the nature of the research objectives, the quantitative methodology complying with the positivist philosophy, and the requirement for empirical analysis of measurable variables of the research, this research design has been selected for the study (Barroga, et al., 2023; Ghanad, 2023). The methodical collection and examination of numerical data, which enables the identification of trends, connections, and causality between variables, is what defines a quantitative research plan, and hence the technique has been found to be especially appropriate in this context of research to examine how predictive AI analysis and AI-measured KPIs affect HR operations in the public sector organisations in the UAE.

The primary justification behind utilising the quantitative research approach in this study originates in the objectives of the study, which focus on assessing the degree to which HR effectiveness is impacted by predictive AI and AI-measured KPIs. Studies that seek to quantify variables and use statistical methods to analyse the correlations between them have been found to be naturally suitable for quantitative research. In the context of this research, the study aims to evaluate how predictive AI and AI-measured KPIs are being applied in HR procedures and how it affects the effectiveness of HR, from the viewpoint of the workforce. The study has been able to methodically gather data from a significant proportion of respondents and analyse it to make inferences about the general population by employing the quantitative technique (Barella, et al., 2024).

The suitability of the quantitative design for the deductive research methodology used in this study has also been a key factor in making the choice for this research design. As has been discussed earlier, the deductive approach uses empirical observation to examine assumptions that are based on established theories. The instruments required for this hypothesis testing are provided by quantitative research,

which has therefore enabled the researcher to use statistical techniques to ascertain if the observed data confirms or contradicts the theoretical claims (Barella, et al., 2024; Barroga, et al., 2023). In this study, the developed hypotheses have been able to be tested by examining the survey data, based on the quantitative research design.

In making the choice for this design, the advantages and disadvantages of the technique have also been reviewed and taken into consideration. The potential of a quantitative research approach to generate unbiased, trustworthy, and broadly applicable results has been noted as one of its main benefits. Quantitative research reduces the possibility of researcher bias and guarantees that the findings are supported by empirical evidence as it is based on numerical data and statistical analysis (Ghanad, 2023; Barroga, et al., 2023). The utilisation of a structured survey instrument in this study has made it possible to obtain standardised data that have been examined to determine trends and patterns in analysing how the AI technologies are affecting HR-related tasks. The results can then be said to be applicable to a larger group of the public sector organisations in the UAE, thereby offering major insights that are both theoretically and practically significant.

The ability of the quantitative research to deal with large datasets is another benefit of the quantitative research design that has been realised in using this technique in this research. Since the focus of the research has been on the public sector employees in the UAE, the collection of data has been necessary to be obtained from a significant amount of sample to guarantee the validity and trustworthiness of the findings. Surveys and other quantitative research techniques are ideal for gathering information from large numbers of respondents in a reasonably quick and economical way. As a result, the researcher has been able to gain a thorough understanding of the variables being studied and draw conclusions about their associations that are statistically significant (Barroga, et al., 2023; Ghanad, 2023).

The use of the advanced statistical methods has also supported the research and helped to obtain greater depth and strength in the analysis of the findings. The PLS-SEM technique has been used to analyse the data gathered for this study, which has been found to be especially helpful for assessing the complicated correlations between the independent, dependent, and mediating factors of the research. As a result of this

research design, the study has been able to offer a more distinct picture of how predictive AI and AI-measured KPIs affect HR effectiveness in the public sector organisations in the UAE.

However, the design has been found to have its limitations as well. Disregarding the background and complexity of the phenomenon being studied has been found to be one of the primary drawbacks of this method. Although the quantitative research has proven to be effective in determining patterns and connections between the variables, it has not suitably been able to completely explain the underlying causes or mechanisms of these connections. While it has been able to show connections between the implementation of AI and HR effectiveness in the context of this study, it has not been possible for the method to provide thorough knowledge of how employees actually perceive and use these technologies on a daily basis (Barroga, et al., 2023; Bergmann, 2023).

4.4 Research Approach

There are three key types of research approaches that are applicable in studies. These include the inductive research approach, deductive research approach, and abductive research approach. For choosing the suitable approach in the current research, the three approaches have been reviewed and analysed to determine which could most effectively address the objectives of the current research.

I. Inductive research approach

The process of investigating that initiates with particular facts or observations and then progresses towards more generalisations and ideas is referred to as an inductive research approach. When research considers an inductive technique, it becomes possible to deduce patterns, themes, and relationships from the data that is collected in the study. This is different from the deductive approach, which begins with a theory and then tests it using actual evidence. The inductive approach can be said to be more exploratory in nature as it leads to be development of new theories or insights

from the data that is collected in the study, rather than initiating the research based on predetermined idea (Woiceshyn & Daellenbach, 2018).

The use of the inductive research approach is more common in conducting qualitative research with the goal of understanding complicated social processes, behaviours, or experience. In utilising this methodology, researchers generally gather data through observations, focus groups, interviews, and content analysis (Woiceshyn & Daellenbach, 2018). After that, they examine the data to identify and assess repetitive themes or patterns, which may lead to the development of fresh hypotheses or conceptual frameworks. As the process is progressive in its application, researchers can improve the way in which they gather and analyse data as they come across new information, and hence can lead to a more advanced understanding of the subject (Azungah, 2018).

This approach is especially more suitable when there is limited information available about a research topic or when the phenomena being studied cannot be sufficiently explained by the existing theories. It enables the researchers to be more adaptable and open-minded in their research approach and steps, thereby allowing the facts to determine the course of the investigation (Azungah, 2018). An inductive technique, for instance, could be used in the social sciences to investigate as to how a particular society views and reacts to a current societal issue that may have been raised. Also, with this technique, it may be possible that researchers can identify ideas and thoughts that were previously not known, by applying methods such as in-depth interviews, which could result in the development of fresh theoretical understandings (Woiceshyn & Daellenbach, 2018).

II. Deductive research approach

The approach of investigation that is referred to as the deductive research approach begins with a fundamental concept or hypothesis and then tests it by gathering and examining facts for its truth and actuality as relevant to the current research topic. This approach operates in a top-down manner, thus, starting with an abstract, general theory or theories and then working down to determine more

specialised findings or inferences. The positivist philosophy, which emphasises upon the testing of pre-existing theories, and confirming hypotheses, followed by establishing cause-and-effect relationships between research variables, is frequently related to the deductive research approach (Azungah, 2018; Woiceshyn & Daellenbach, 2018).

Identification of pre-existing theories that are relevant to the research subject, and formulation of hypotheses or research questions based on them are the usual initial stages in the deductive research approach. Subsequently, these theories undergo thorough and monitored empirical testing, frequently utilising quantitative data. Surveys, experiments, or secondary data analysis, where the variables are precisely described and quantified, are generally used as the main data collection techniques. The conclusions drawn from such evidence are then used to validate, modify, or invalidate the underlying theory by supporting or contradicting the initial premise (Azungah, 2018).

This method is frequently applied in areas where testing and validation of theoretical conceptions is the main objective, such as in social sciences, psychology, economics, and natural sciences (Woiceshyn & Daellenbach, 2018). A researcher may begin, for instance, with a theory claiming that a certain training program improves employee productivity. The validity of the idea would then be tested by gathering and analysing data from employees who had received the training to determine whether there has been a statistically significant increase in productivity. The deductive technique is especially helpful while testing hypotheses derived from established concepts, and in generating findings that can be used broadly, or expanding on earlier research. It makes it possible to conduct a better organised, and controlled investigation with precise instructions on data collection and analysis methods. The findings are thus more credible and reliable when this approach is used, since the results are frequently easier to duplicate and more objective in nature (Azungah, 2018).

III. Abductive research approach

Abductive research approach involves developing ideas or hypotheses based on the most reasonable explanation for a collection of observations that a study obtains. The abductive approach begins with an incomplete set of observations and attempts to explain them by identifying the most likely or acceptable explanation, which therefore contrasts with the deductive approach, which evaluates hypotheses, and the inductive approach, which develops theories from evidence. This approach is frequently explained as offering reasoning towards the most probable explanation for a study (Awuzie & Mcdermott, 2017).

This approach particularly proves to be helpful in dealing with unexpected or unexplained phenomena that are otherwise difficult for current theories to explain. After identifying an anomaly or unexpected occurrence, the researcher investigates into several potential causes for the unusual occurrence. Even if the hypothesis is not immediately obvious or evident, the objective remains to find the hypothesis that most effectively explains the observed data (Conaty, 2021). As it involves reviewing several options and improving the hypothesis based on new facts, this method is by its very nature proves to be creative and dynamic.

The abductive methodology is frequently employed in qualitative research, especially in areas such as criminology, sociology, and anthropology where deductive or inductive approaches may not be sufficient to fully understand complex social phenomena (Conaty, 2021).

Abductive reasoning is also frequently used in diagnostic medical settings, as physicians often must make quick judgements based on insufficient data and determine the most likely diagnosis from the symptoms of the patient. Similar to this, abductive reasoning can be applied in the business world to help organisations to modify their strategy by assisting in the understanding of consumer behaviour that is found to deviate from established patterns (Awuzie & Mcdermott, 2017). However, the abductive approach has drawbacks despite its flexibility and capacity for the discovery of fresh insights. This is so because, the outcomes obtained through abduction may not always be final and could need to be verified again using deductive or inductive

reasoning. Furthermore, abduction might be subjective as it depends on the judgement of the researcher for selecting the most feasible response (Awuzie & Mcdermott, 2017; Conaty, 2021).

Research Approach Chosen for the Current Research

The current research has considered the deductive research approach to guide the methodology of the study. Selecting a deductive approach for the study has been a carefully considered choice that matches with the overall methodological framework of this research, the nature of the inquiry, and the research objectives. Deductive reasoning, which is frequently connected to positivist philosophy, has focused on developing hypotheses based on theories and then arriving at a plan of action for carrying out empirical research to test these hypotheses. This method has worked especially well for this study that has used observation and data analysis to test theoretical hypotheses while developing specific correlations between the research variables (Azungah, 2018).

The deductive approach that has been used in this study has been initiated with the identification of theories and concepts that are associated with the effects on HR activities of predictive AI analysis and AI-measured KPIs.

The study has made use of previously published researches, which have examined the incorporation of AI into HR procedures and its effects on the performance of organisation (Woiceshyn & Daellenbach, 2018). The study has formulated specific hypotheses to anticipate the interactions between the independent variables (predictive AI and AI-measured KPIs), the mediating variables (employee readiness and efficiency), and the dependent variable (HR effectiveness) based on this theoretical framework. After that, these theories have been empirically tested using quantitative research techniques.

The systematic and structured aspect of the deductive research approach is the primary reason for choosing it for this research, as it has been found to align well with the objectives of the study (Woiceshyn & Daellenbach, 2018). A general theory or set of principles have been the starting point for the deductive approach, which have

enabled the researcher to make progress towards more focused observations and conclusions for the study. The broad hypothesis in the context of this study has been concerned with how the AI technology might improve HR management. The specific observations, on the other hand, have been concentrated on the ways in which these technologies affect the efficacy of HR in the public sector in the UAE. The deductive approach has guaranteed that the research stays focused and clear by adhering to its rational direction, whereby each stage of the process is clearly linked to the previous theoretical framework.

Furthermore, when testing the hypotheses that have been derived from established theories, the deductive technique has been found to be especially beneficial. The hypotheses of the study are grounded upon established concepts of AI integration and HR management. An example of a hypothesis might be that the use of predictive AI in HR procedures enhances decision-making, which in turn increases HR effectiveness. An alternative theory can be said to propose that the correlation between AI adoption and HR performance is mediated by employee preparedness, whereby higher levels of readiness correspond to more favourable outcomes. With the help of quantitative data and the deductive technique, these assumptions have been thoroughly evaluated, thereby generating empirical evidence that have confirmed or contradicted the theoretical claims.

The objectivity and dependability of the research have further been improved by the deductive method. As the study has been driven by predetermined hypotheses, data collection and analysis have been done using organised methods by the researcher. In addition to ensuring that the research conclusions are supported by impartial, and verifiable evidence, this approach has also reduced the possibility of bias (Azungah, 2018). A survey instrument has been considered to evaluate the variables of the study, including the degree of AI implementation in HR, the efficacy of AI-measured KPIs, and employee experiences of AI in the workplace, which have been used to collect data for this study. By enabling the researcher to verify the assumptions methodically and thoroughly, statistical tools like partial least squares structural equation modelling (PLS-SEM) have further strengthened the deductive approach.

The alignment of the deductive method with the objective of this research to generate findings that can be used broadly has been another major factor driving the decision to adopt this approach. Deductive reasoning begins with a general theory and examines it in a particular environment, wherein if the hypotheses are validated, the results are generally transferable to other research and applicability settings (Azungah, 2018). Although the focus of this research has been on the public sector organisations in the UAE, its findings can be said to have implications for other industries or geographic areas as well, where the AI technology is being incorporated into HRM. Thus, this research, which has employed a deductive methodology, has also advanced the theoretical knowledge of AI in HR and has offered useful recommendations that may influence HR procedures across a range of organisational contexts.

Moreover, the deductive methodology has been consistent with the practical and administrative consequences of the study. Informed decisions about AI adoption can be made by policymakers and HR professionals working in the UAE public sector with the use of the practical insights of this research. Based on this approach, this study provides precise, and fact-based guidance on how to integrate AI-measured KPIs and predictive AI into HR procedures in an efficient and effective manner by testing particular assumptions. These useful insights can be said to be essential in order to guarantee that the research has a noticeable influence on HR management practices (Woiceshyn & Daellenbach, 2018).

4.5 Population and Sample

Population and sampling are fundamental components in research methodology that have significant effects on the accuracy and applicability of the findings of research. Comprehending these ideas is essential to develop strong investigations using mixed, qualitative, or quantitative methodologies. Population and sampling have been a major part of the research methodology of this study as well and to make the right choice for the study, the existing concepts and strategies have initially been reviewed and analysed, and then the final choice has been considered.

In research, the term population refers to the complete set of people, things, or components that the researcher is interested in and that have similar qualities. This group stands for the larger set that a researcher tries to infer relationships from. The population can be limited and focused, or big and comprehensive (Willie, 2024). The target population and the accessible population are the two primary categories into which a research population is divided. While the target population comprises all individuals or elements to whom the researcher seeks to generalise the findings, the accessible population is made up of those members of the target population who are truly available to engage in the study (Willie, 2024; Thacker II, 2020).

The process of choosing a subset of people, items, or components from the population to take part in a research project is known as sampling. Sampling is used to make research more manageable and economical by allowing generalisations about the entire population to be made from the analysis of this smaller group. Sampling is required since it is frequently impractical or impossible to examine the entire population owing to limitations in terms of time, resources, and accessibility in research (Makwana, et al., 2023). A sample in research must be representative of the target population for the findings to be generally applicable. A sample is considered representative when it accurately represents the characteristics of the population from which it has been taken. The parameters of a representative sample are its size, the method of sampling that is used, and the degree to which the sample represents the diversity of the population (Makwana, et al., 2023; Lee, et al., 2010).

Population and Sampling for the Current Research

Considering the current research, the target population and the sampling strategy have been focused upon with due care, to ensure that they are aligned with the objectives of the research, and findings based on the participants could enable fulfilling the objectives towards drawing the suitable conclusions for the study. For this research, the target population has included employees currently working in the public sector organisations in the UAE, since this sector is the core focus of the research. Thus, the

chosen population can be said to be relevant to the research context and has allowed focusing on analysing the impacts of AI in HR effectiveness.

The federal government sector of the UAE has been the key focus in this research for purpose of data collection, which is a sector where many employees are currently employed in different operational and functional roles across different departments, organisations and agencies. Several factors have influenced this choice of the target population in this study. Firstly, the federal government sector in the UAE is actively implementing digital transformation programs, such as implementation of AI technologies to improve productivity and decision-making. As a result, employees in this sector can be said to be more interactive with AI-driven HR solutions more frequently, which makes them a relevant population to study the effects of predictive AI and AI-measured KPIs on HR effectiveness. Secondly, the uniform HR procedures and structured environment of the UAE public sector tend to offer a consistent framework for researching the effects of AI, while ensuring that the results may be applied to the entire industry.

The study has used a stratified sampling method to choose a representative sample of 379 respondents considering the target population. This has been based on the recommendations and instructions offered by the Krejcie and Morgan (1970) model, following which the sample size has been determined in this case (Krejcie & Morgan, 1970). There are various factors that have been considered in the selection of the stratified sampling method. The stratified sampling is a method based on which the target population has been divided into distinct subgroups, or strata, which have shared common characteristics in relevance to the subject of this research. In the context of the study, the strata have included different job levels, departments, and employee demographics within the federal government of the UAE.

After dividing the population into these strata, the sample has been drawn proportionally from each subgroup to maintain the diversity of the entire population. By using the stratified sampling technique, this study has aimed to obtain a balanced view of how the predictive AI analysis and AI-measured KPIs impact the various employee related aspects and segments. This has been particularly valuable considering the focus of the research on the public sector, where the roles and responsibilities of the

employees tend to vary widely, and the perspectives on AI integration in HR also differ significantly across the different groups.

The stratified sampling has particularly been useful here because it has allowed the researcher to determine the potential differences in the attitudes of the individuals towards the AI-driven HR practices among the diverse groups of the employees within the sector. For example, the senior management have had their distinct perspectives on AI for HR decision-making in comparison to the other frontline employees. The structured sampling approach thus has ensured that the viewpoint of each subgroup has been proportionally represented, thereby, providing a comprehensive understanding of the impact of predictive AI and AI-measured KPIs across the sector. By enhancing the inclusiveness and accuracy of the sample, the stratified sampling has supported the objectives of the study of making informed, and generalisable conclusions about the influence of AI on the HR strategies within the UAE public sector.

Sampling Design

A stratified sampling design was employed to ensure that the study sample adequately represents HR managers and professionals working within UAE federal public sector organizations involved in AI integration in HR practices. This method was chosen to capture the diversity of the population in terms of work experience, job roles, and departmental affiliations, thereby ensuring balanced representation across different strata. To determine the required sample size, Krejcie and Morgan's (1970) model was applied using the study population parameters, which indicated a target of 379 respondents. Ultimately, 271 valid responses were obtained, reflecting a response rate of approximately 71.5%. This sample is considered sufficient to support reliable analysis of perspectives on the implementation of predictive AI analysis and AI-measured KPIs across varying levels of HR management.

A systematic approach is considered for designing the sample of this study, to ensure that the selected sample can rightly represent the target population of the research, which comprises of the HR professionals and policymakers operating within the public sector organisations in the UAE. A stratified sampling technique has been

considered essentially to address the diverse nature and characteristics of the population such as the varying levels of their work experiences, job roles, and the departments in which they are currently operating. This method has been expected to ensure that the different strata or groups of HR individuals can be effectively represented for the sample selection. Here, it may be noted that this sampling design has been focused on aligning with the specific objectives of the research so that the selected sample participants can shed light effectively on the implementation of predictive AI analysis and AI-measured KPIs across various levels of HR management, based on which the analysis of the study is done. The Krejcie and Morgan's model has further enabled the selection of the sample size to ensure that a significant number of the participants are included for the purpose of the data collection.

4.6 Data Collection

The procedure for collection of data can be considered as the most important aspect of the methodology of this research. Firstly, the various strategies have been studied and evaluated to establish which would be the most appropriate and effective technique for the current research, thus considering the goals of the study, and putting it into practice accordingly aligned with the chosen technique. As data collection directly affects the validity and trustworthiness of findings and conclusions of a study, hence it is a crucial step in any research process. There are various approaches available that can be used for the data collection in research, depending on whether the research is qualitative or quantitative. Considering that every approach has a different set of applications, benefits, and drawbacks, it is important for researchers to carefully assess which technique is best for their specific research objectives.

○ Quantitative data collection

Measuring the research variables based on collection and analysis of numerical data to test for the research hypotheses are the primary objectives of quantitative research. Standardised and structured data collection methods are used in quantitative

research to enable statistical analysis and to make the results more broadly applicable to larger populations. A few of the main methods for gathering quantitative data are observational studies, experiments, surveys, and questionnaires, along with secondary data analysis (Ghanad, 2023; Barella, et al., 2024).

Surveys and questionnaires are the most often used methods for obtaining quantitative data for research projects. These kinds of survey questionnaires consist of a series of closed-ended questions that are designed to gather data from many respondents. Surveys can be conducted in a few methods, including online method, by mail, over the phone, or in person. Researches in areas such as public policy, health research, marketing, social sciences, are found to commonly use this technique for their data collection (Rathi & Ronald, 2022).

Data from a large sample can be gathered through surveys, which offers a major benefit of this technique, and therefore increases the generalisability of the results. Also, surveys can be smoothly administered and are generally more cost-effective. However, as some respondents may not always offer their completed responses, hence the responses could also be superficial at times. Moreover, if the sample is not representative or the questions are poorly constructed, then bias may also result from the technique (Rathi & Ronald, 2022; Taherdoost, 2022).

In an experiment, the process functions by altering one or more independent variables to determine how they affect a dependent variable. This method is frequently used in natural sciences, psychology, and medical areas where it is focused upon to establish the cause-and-effect relationships between the variables. Experiments can be carried out in natural settings or in controlled conditions such as in laboratories. A major advantage of this technique is that the researchers can prove causation and account for insignificant factors or variables undertaken in research. Also, if the experiences are designed well, they can yield highly reliable results. However, conducting the experiments often prove to be expensive as well as more time-consuming. Moreover, there may be ethical issues associated with the technique, particularly when working with human subjects. The applicability of the research outcomes to actual situations may also be limited by the artificial nature of some of the studies (Taherdoost, 2022).

Observational studies involve methodically documenting actions or occurrences as they happen in their natural settings, without any kind of control on them. This technique is more applicable and suitable in research disciplines such as psychology, social sciences, and epidemiology. Studies that use the observation method can be classified as longitudinal (where the observation is done over a longer period of time) or cross-sectional (where the observation is done on a single point in time) (Smritirekha, 2019). Observational research can be done in environments where experimental manipulation is not possible and where the study can offer real-world insights. The observations prove to be helpful for researching trends and natural behaviours. However, the absence of control over variables has a disadvantage in that the causality of the variables can be difficult to prove or establish.

Another possibility is the biases from the observer, in which the expectations of the researcher can strongly influence the observations and hence the research outcomes (Taherdoost, 2022).

The secondary data analysis involves utilising pre-existing data, such as government records, statistical data, medical records, or surveys, that have been gathered by other researchers or organisations in relevance to a current research subject. This method proves to have strong impact and potential for researches in social sciences, public health, and economics. As the secondary data is already available in existing sources, it is possible to gather the same and analyse the data more quickly and at a lower cost for the research as well. It eliminates the requirement for original data collection and enables academic researchers to investigate fresh issues or hypotheses. However, the accuracy and quality of the data may not be in the control of the researcher. There may be limits in the analysis and interpretation if the data do not precisely match the subject of the research (Barella, et al., 2024; Taherdoost, 2022).

o Data Collection for the Current Research

In the current research, a primary data collection method based on quantitative surveys has been considered. The quantitative data collection has been characterised by the use of standardised tools, such as surveys or questionnaires, to gather numerical

data that has been subjected to statistical analysis for determining the correlation between the research variables. The survey approach has been chosen as the key method to collect data for this investigation (Rathi & Ronald, 2022). Considering that surveys enable faster and efficient collection of data from many respondents, this method has been found to be significantly useful in quantitative research as applied in this study towards analysing how predictive AI and AI-measured KPIs affect HR effectiveness in the public sector of the UAE.

The purpose of the survey that has been employed in this study has been to gather information on multiple aspects of HR effectiveness as they relate to AI technologies. Precisely, the survey has focused on asking the respondents about using AI-measured KPIs, using predictive AI analysis in HR procedures in their public sector organisations, and to obtain the perceptions of employees on the efficacy of the AI tools in the federal government sector of the UAE.

The survey can be said to have made it possible to gather consistent and comparable data from a significant sample of respondents by employing a structured questionnaire with predetermined response options (Taherdoost, 2022).

The decision of considering the survey strategy for this research has been based on analysing several key factors. First, considering the emphasis of the study on the federal government sector in the UAE, surveys have been found to be a suitable and productive means of obtaining information from a significant large and widely distributed population. It has been necessary for this research to reach a large number of participants in order to ensure that the sample is representative of the target population, which has in turn helped to improve the generalisability of the conclusions of the research (Rathi & Ronald, 2022).

Secondly, surveys have been found to be a suitable way to obtain the self-reported behaviours, attitudes, and views of the respondents, all of which can be said to have been crucial to achieve and fulfil the objectives of this research. Opinions of the employees on the usefulness of predictive AI and AI-measured KPIs in HR operations have been focused upon and realised in this study through the surveys. Since these opinions are individualised and subjective, the survey approach has been considered

and believed to be a suitable means of recording the variedness among the respondent opinions (Rathi & Ronald, 2022).

Thirdly, the organised format of surveys has made it possible to gather information that is simple to quantify and then evaluate the data using statistical methods. This has been especially crucial in using the quantitative research design in this study as it has allowed the researcher to test the research hypotheses, find correlations between the research variables, and make conclusions supported by actual data (Taherdoost, 2022). To investigate the associations between the independent and dependent variables in this instance, the survey data have been analysed using partial least squares structural equation modelling (PLS-SEM) and descriptive statistics.

The survey for this research has been carefully developed to guarantee that relevant and trustworthy data would be collected while also fulfilling the objectives of the investigation. A number of closed-ended questions has been included in the survey questionnaire, most of which had Likert scale ratings. This scale has been selected as it has been found to enable the survey respondents to indicate how much they agree or disagree with a range of assertions that have been developed to as them regarding the application and efficacy of AI technology in HR-related operations in their public sector organisation.

A stratified sampling technique has been considered based on which 379 employees from the federal government sector in the UAE have been selected and included as part of the survey sample. As the survey has been provided electronically to all the participants, they have had the opportunity to finish it as per their convenience of time and location. This strategy has therefore guaranteed an efficient and cost-effective way to collect the data for the research (Taherdoost, 2022).

The survey method has been found to be most practical and feasible considering the context of this study. The UAE federal government sector is a large and geographically dispersed population, making it more challenging to collect data through methods that require face-to-face interaction, such as interviews or focus groups. The use of electronic surveys instead has allowed the researcher to reach out to a large number of respondents quickly and efficiently, thereby ensuring that the data collection is completed within the required timeframe.

o Questionnaire Development Process

The development of the questionnaire for this study has followed a structured approach to ensure accurate measurement of the research variables and their relationships. Initially, key themes from the literature review have been identified, including predictive AI analysis, AI-measured KPIs, and HR effectiveness. These themes have guided the development of measuring items that reflect the objectives of the research. The questionnaire consists of multiple sections, each addressing a specific variable. The items that have been developed for measuring the effectiveness of AI integration have been focused on asking the HR managers to evaluate whether and how the AI tools have improved their decision-making and performances of their employees.

The key steps of the questionnaire development are based on – defining the objectives, review of the literature, drafting of the initial questions, pilot testing, and finalisation. The first stage is to precisely outline the goals of the questionnaire and align them with the key focus of the study. In the instance of this study, the specific goals are to analyse the degree of AI integration in the HR processes, evaluate the efficiency of the KPIs that are assessed by AI, and to comprehend the challenges that are associated with implementing the predictive AI in the public sector. The questionnaire is designed to collect information specifically based on these characteristics while ensuring that it is relevant to the goals of this research.

The selection of the key concepts and themes for the questionnaire can be said to be assisted through the review and analysis of the existing literature available on KPI measurement, AI in HR, and HR technologies. The development of the themes and the constructs for the questionnaire, which ensure that it is thorough and accurately reflects the current academic debates as well as the potential practical issues, is significantly supported and guided by the literature on AI-measured KPIs, predictive AI, and HR practices in the UAE public sector.

The third phase involves developing the draft questions for the initially developed themes that are identified. In this instance, the questions are created based on the fundamental concepts of the AI integration in HR, the KPI efficacy, the workforce development, and the challenges in AI adoption. In order to obtain insightful

data from the participants, the questionnaire is aimed to include both the open-ended and close-ended questions based on the Likert scale, and hence supporting adequate and effective data collection for the study.

Further adjustments in the questionnaire are considered based on the feedback that is obtained after conducting the pilot research with a small sample size to test the suitability of the questionnaire for effective data collection. Thus, the final version of the questionnaire is developed after the pilot test and further modifications. It has key sections that are dedicated to each of the study objectives, thus, ensuring that the information gathered is thorough and useful. Additionally, the questions are considered to be properly ordered, initiating from broader enquiries about HR procedures in the UAE public sector to more focused enquiries about the integration of AI, its challenges, and the efficacy of KPIs.

Respondents have been required to rate these items on a Likert scale ranging from "1 = Strongly Disagree/Very appliable" to "5 = Strongly Agree/Not applicable." In addition, the items measuring the training methods in AI-based HR functions have asked the respondents to rank the relevance of specific AI tools that are used for training within their organisations, using a scale from "1 = Not Applicable" to "5 = Very Applicable." The measuring items and scales used have been pre-tested and validated in pilot research to ensure their reliability and appropriateness for this study.

○ Questionnaire with Table of Measurements

The questionnaire for this study is designed to measure the key constructs of the research, with each of the sections being focused on aligning with the specific objectives of this research. Each part of the questionnaire is developed based on a 5-point Likert scale to effectively obtain the agreement or disagreement of the respondents with the given statements, which are measured based on the response options ranging from Strongly Disagree (1) to Strongly Agree (5). Following is an example of how each section of the questionnaire is structured along with tables of measurements.

Section 1: AI Integration in HR

This section focuses on assessing the level of AI integration within the activities in HR, focusing on automation, decision-making, and predictive capabilities.

Table (4- 2): Measuring items for AI integration in HR

Question	Measurement	Scale	Source
AI tools are integrated into our HR recruitment processes.	AI Integration in Recruitment	1 (Strongly Disagree) to 5 (Strongly Agree)	(Ahmed, 2018)
Predictive AI helps in forecasting needs of the workforce.	AI Forecasting	1 (Strongly Disagree) to 5 (Strongly Agree)	(Al Marri, et al., 2018)
AI-based systems have reduced the administrative tasks in HR.	AI Efficiency	1 (Strongly Disagree) to 5 (Strongly Agree)	(Alsaif & Aksoy, 2023)
AI analysis has improved decision-making in talent management.	AI-driven Decision Making	1 (Strongly Disagree) to 5 (Strongly Agree)	(Bujold, et al., 2023)

Sources: developed by the authors

Section 2: Effectiveness of AI-Measured KPIs

This section focuses on how the AI-measured KPIs impact the HR practices, particularly in evaluation of performance and in decision-making.

Table (4- 3): Measuring items for effectiveness of AI-measured KPIs

Question	Measurement	Scale	Source
AI-measured KPIs provide more accurate performance evaluations.	KPI Accuracy	1 (Strongly Disagree) to 5 (Strongly Agree)	(Kaur, et al., 2023)

AI-based KPI data is used in our strategic HR decision-making.	Strategic Decision Impact	1 (Strongly Disagree) to 5 (Strongly Agree)	(Sentamilselvan, et al., 2023)
AI tools have improved the transparency of our employee assessments.	KPI Transparency	1 (Strongly Disagree) to 5 (Strongly Agree)	(Soni, 2022)
Our HR department relies on AI-driven KPI data for workforce planning.	Workforce Planning	1 (Strongly Disagree) to 5 (Strongly Agree)	(Sharma, 2024)

Sources: developed by the authors

Section 3: Challenges in AI Integration

This section aims to gather insights in respect of the challenges that are faced by the public sector organisation in integrating AI into their HR practices.

Table (4- 4): Measuring items for challenges in AI integration

Question	Measurement	Scale	Source
Resistance to change among employees is a barrier to AI adoption.	Employee Resistance	1 (Strongly Disagree) to 5 (Strongly Agree)	(Basnet, 2024)
Our HR department lacks the technical skills to manage AI systems.	Skills Gap	1 (Strongly Disagree) to 5 (Strongly Agree)	(Menaka, 2023)
There is a lack of budget in our organisation for AI implementation in HR.	Budget Constraints	1 (Strongly Disagree) to 5 (Strongly Agree)	(Haak-Saheem, et al., 2017)
AI systems are not customised to the specific needs of our HR department.	AI Customisation Issues	1 (Strongly Disagree) to 5 (Strongly Agree)	(Mikalef & Gupta, 2021)

Sources: developed by the authors

Section 4: Employee Readiness for AI Integration

This section measures the level of readiness among the employees to adopt and work with AI-driven tools within the HR framework.

Table (4- 5): Measuring items for employee readiness for AI integration.

Question	Measurement	Scale	Source
Employees are provided with adequate training to work with AI systems.	Training Adequacy	1 (Strongly Disagree) to 5 (Strongly Agree)	(Tambe, et al., 2019)
Employees are comfortable using AI tools in their daily HR activities.	Employee Comfort with AI	1 (Strongly Disagree) to 5 (Strongly Agree)	(Sari, et al., 2020)
There is a strong culture of innovation that supports AI integration in our organisation.	Innovation Culture	1 (Strongly Disagree) to 5 (Strongly Agree)	(Basnet, 2024)
Employees view the AI as a valuable tool for improving HR functions.	Perceived Value of AI	1 (Strongly Disagree) to 5 (Strongly Agree)	(Rodgers, et al., 2023)

Sources: developed by the authors

4.7 Data Analysis

The analysis of collected data can be said to be an important phase in the research process as it transforms the raw data into relevant insights that can help to answer the key research questions and support or refute the hypotheses of the study. The methodologies that are available and utilised for data analysis in different researches tend to differ according to the specific objectives of a study, and whether the research follows a qualitative or a quantitative research approach. Each of these techniques has its unique uses, benefits, and limitations that need to be carefully considered to achieve valid and accurate analysis of research findings. In the current research context, the choice of the data analysis method has been considered after thoroughly reviewing the existing analysis methods, and then the most suitable method has been employed in this study.

The method of data analysis that has been chosen for this study is the Partial Least Squares Structural Equation Modelling (PLS-SEM), which is a statistical approach that is especially suitable and effective for analysing complex interactions between variables in research models. This technique is ideal for examining the possible relationships and mediating effects of multiple independent and dependent variables (Magno, et al., 2024), thus making it highly relevant to this study, which investigates the impact of predictive AI analysis and AI-measured KPIs on HR effectiveness in UAE public sector organisations.

The PLS-SEM is a variance-based structural equation modelling approach that enables researchers to estimate and analyse the complex cause-and-effect relations between its variables. It is especially effective when the research aims to predict and explain the variability in its key target constructs and focuses on establishing correlations between the studied research variables. PLS-SEM can handle models with a large number of components, markers, and interactions, thus, making it ideal for exploratory or predictive research. Furthermore, PLS-SEM does not require a large sample size or the assumption of normal data distribution, which is sometimes a limitation in other SEM techniques (Magno, et al., 2024).

Data Cleaning, Data Coding, Data Presentation

The first crucial stage in the data analysis procedure in this study is data cleaning. It involves finding and correcting any errors or discrepancies in the data that is gathered. The information gathered from the questionnaires is carefully reviewed in this study to look for any missing values or duplicate entries that might have an adverse effect on the findings. If missing data is determined to be important, it has been either ignored or filled in using statistical techniques like mean substitution. In order to take the data into account for the study, actual variances or errors in data collection have also been assessed. This procedure has guaranteed the accuracy, dependability, and integrity of the dataset under analysis for the study.

Data coding has been done to convert the unprocessed data into useful categories for analysis once it has been cleaned. For the sake of convenience of statistical analysis, the responses collected in this study have been coded by giving numerical values (1 = Strongly Disagree, 5 = Strongly Agree) to the Likert scales. The obtained responses have been categorised according to recurrent themes, and variables have been sorted into relevant groups such as employee performance, HR effectiveness, and AI integration. This phase has been crucial for organising the data so that statistical analysis utilising analysis software like SPSS may be done successfully.

To effectively and concisely communicate the results, the data in this study has been systematically organised and summarised. Descriptive statistics such as means, frequencies, and percentages have been applied to provide an overview of the sample characteristics and responses. For hypothesis testing and model evaluation, the study has employed Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS software. This approach has enabled the assessment of measurement models (validity and reliability of constructs) and the structural model (relationships among variables). The use of SmartPLS allowed for testing path coefficients, R^2 values, effect sizes, and predictive relevance, ensuring robust insights into the role of predictive AI analysis and AI-measured KPIs in enhancing HR effectiveness. This structured method of data presentation ensures that the findings are both clear and aligned with the research objectives.

4.8 Research Variables

- **Variable 1: Implementation of Predictive AI Analysis in HR (Independent variable)**

The application of predictive AI analysis in HR is the first independent variable in this research. The variable indicates the level at which predictive AI tools and approaches are currently incorporated into the HR procedures and functions within the UAE public sector organisations. Predictive AI analysis essentially involves the use of sophisticated algorithms and machine learning models which function to forecast

future trends, behaviours, and results based on past data (Bajwa, et al., 2021; Haleem, et al., 2022; Ersoz, et al., 2023; Al-Blooshi & Nobanee, 2020). It can be used in HR to improve talent management strategies, forecast demands in employee staffing, anticipate turnover situations among employees, and optimise recruitment procedures (Raghupathi & Raghupathi, 2021; Sghir, et al., 2023).

The focus of the research to emphasise upon predictive AI analysis as a crucial factor was motivated by the increasing significance of data-driven decision-making in HR operations. It has increasingly become critical to accurately forecast results and to be able to identify potential challenges in HR as businesses depend more and more on data and informed decisions to guide their HR strategies. It is therefore possible for HR employees to make better judgements with the support of predictive AI analysis, which enhances the general efficacy and efficiency of the HR operations in an organisation (Sghir, et al., 2023; Al-Blooshi & Nobanee, 2020). By evaluating patterns in employee behaviours, performance indicators, and other relevant data, the predictive AI can offer valuable insights that would otherwise be challenging to obtain and realised based on the conventional HR techniques (Lalitha, 2019; Kakulapati, et al., 2020; Mohammed, 2019).

In this study, the extent to which these technologies are incorporated into various HR processes within the selected organisations in the UAE public sector, serves as an indicator for the implementation and effectiveness of predictive AI analysis in HR. The availability of predictive AI technologies, how frequently they are used in decision-making in HR, and the perceived value that they provide to HR operations are some of the major aspects that influence the degree of application of the technology as has been focused in the study. Thus, this variable proves to be the starting point for investigating how AI affects HR effectiveness in the UAE public sector, considering that it has a direct impact on the outcomes of HR operations and the capacity of an organisation to meet its strategic objectives.

- **Variable 2: Application of AI in HR (Independent variable)**

The application of AI in HR processes is the second independent variable in this research. This variable reflects the level at which the AI technologies are utilised and are necessary to streamline and enhance the different processes in HR, such as in considering hiring processes for new employees, their onboarding, training, performance management, and to ensure higher engagement levels of the employees (Sheshadri & Palivela, 2023; Mikalef & Gupta, 2021). A wide range of tools and technologies based on AI are currently applicable and utilised in HR processes, which enable the functions to be automated and optimised more effectively. This is in contrast to the predictive AI analysis wherein the focus is more conducting forecasts and predictions on data to determine future trends and patterns (Sheshadri & Palivela, 2023; Prakash, 2019).

This variable has been focused upon in this study considering the increasing levels of application and use of the AI technologies in HR processes, across different business sectors. Applications of AI in HR enable enhancing the potential of organisations and their HR functions to be able to better manage their workforce as these technologies allow processes to be automated, while also ensuring that human errors can be minimised and that employees can be provided with more personalised experiences in their workplaces (Aparanji, 2023). For example, with the implementations of AI-powered chatbots it is possible for an organisation to more effectively handle the routine employee investigations, which in turn can allow the HR members to have their focus on more important responsibilities and activities at work.

Similarly, recruitment methods supported by AI systems have the potential to analyse large volumes of data relevant to applicants, which in turn can help the organisation to determine which candidates would be most suited to the specific job role and culture of an organisation (Mikalef & Gupta, 2021; Aparanji, 2023).

In this study, the implementation of AI in HR operations has been evaluated based on the variety and complexity of AI technologies used by the researched organisations. This involves assessing how well AI is incorporated into specific HR activities, how frequently the AI technologies are used, and how these technologies are considered to impact the HR operations in the sector. The aim of the research has been

to investigate this variable to better understand how the use of AI in HR procedures affects the overall HR effectiveness and performance of the researched organisations in the UAE public sector.

- **Variable 3: Implementation Efficiency**

The third variable – implementation efficiency, acts as a mediating element in this research. Implementation efficiency here, relates to how successfully AI technologies are incorporated into the HR processes and used throughout the organisation. This variable can be said to be critical since the benefits of AI in HR are not only based on the presence of the AI tools and systems, but also on how effectively they are implemented and maintained, and measured in terms of their impacts on the HR effectiveness in the organisations (Sheshadri & Palivela, 2023; Prakash, 2019).

Efficiency in AI implementation is determined by various aspects, including the willingness of an organisation to adopt the new technologies and advances, the adequacy and effectiveness of the training provided to HR employees, the compatibility of the AI tools with the current HR systems, and the level of support from organisational leadership (Sheshadri & Palivela, 2023; Prakash, 2019). An efficient implementation process guarantees that AI technologies are not only installed, but also efficiently used to accomplish the desired results. It addresses potential issues such as employee resistance to change, technical challenges, and the necessity for continuous monitoring and enhancement of AI applications (Mikalef & Gupta, 2021).

This research has focused on evaluating the implementation efficiency of AI in HR in the UAE public sector organisation, using surveys that have enabled measuring several key aspects of the AI integration process, such as inputs and efforts of the employees on the ease of use of the technological advances, the effectiveness of the training programs, and the overall levels of satisfaction with the AI tools that have been applied. The objective of the research in examining these aspects has been to establish an understanding on the level of effective implementation that has the potential to mediated the association between AI use in HR and HR effectiveness.

- **Variable 4: Employee Readiness**

Employee readiness is the fourth variable addressed in this study, and which has been studied as the mediating variable to determine its impacts on the association or correlation between AI and HR effectiveness in the UAE public sector organisations. Employee readiness is defined as the preparedness, willingness, and ability to adopt and adapt to AI-driven changes in the HR operations of an organization, among its employees (Ezzaim, et al., 2023). It includes analysing the attitudes of employees towards AI tools and their applications, their levels of comfort with the new technologies, and their perceived capacity to efficiently learn and use the AI tools in their daily work (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

Employee readiness can be understood as a crucial factor in effecting the use of AI in HR, since the effective application of AI in the organisational HR operations can be determined not only by the availability of the technology, but also by the employees and their engagement with the systems who utilise the advances (Joshi, 2023; Ezzaim, et al., 2023). Factors such as employee resistance to change, a lack of critical skills, or uncertainty about the implications of AI for their jobs can all have a substantial impact on the effectiveness of AI implementation in HR. However, when the employees are ready and willing to accept AI, they can be expected to be effective in their contributions and engagement with the system for its adoption, thereby resulting in smoother implementation of the systems and better outcomes in HR (Rajeshwari, et al., 2023; Shree V & Krishnan, 2023).

In this research, the factor of employee readiness has been measured through surveys that have examined the attitudes of employees towards AI in HR processes, their degree of training and understanding of the AI tools, and their general confidence in using these technologies. The goal of the research in examining these characteristics has been to identify how employee readiness influences the relationship between AI application in HR operations and HR effectiveness.

- **Variable 5: HR Effectiveness (Dependent variable)**

The fifth variable of this research – HR effectiveness, serves as the dependent variable of the study. HR effectiveness refers to the capacity of an organisation to achieve its goals and to contribute to the overall success of an organisation. This variable constitutes a wide range of factors related to HR operations such as HR efficiency in employee recruitment and selection, employee retention strategies and efficiency, employee performance management, employee satisfaction levels, and the alignment of the overall HR strategy with the goals of the organisation (Rotich, 2015; Lee, 2021; Bas, 2012).

The variable of HR effectiveness can be considered as a key indicator of the success in HR operations within an organisation considering it allows measuring the performance and effectiveness of the HR practices in attaining the goals of an organisation. It may be noted here that an effective HR management has the potential to lead to a variety of favourable outcomes for a business, such as in respect of increased employee engagement, increased employee productivity, effective talent acquisition, and favourable employee retention (Panneerselvam & Balaraman, 2022; Johnson, et al., 2016). In contrast, if the HR approaches prove to be inefficient, they can result in increased turnover rates among employees while also lowering their morale at work, and can also affect the alignment between HR priorities and the goals of an organisation (Rotich, 2015; Lee, 2021).

In the context of this research, HR effectiveness has been evaluated as the outcome of implementing and applying AI technologies in HR processes in the UAE public sector organisations. The study has focused on determining as to how the integration of AI-driven tools and techniques has influenced HR effectiveness, and how the efficiency of implementation and employee readiness has mediated this relationship. By examining HR effectiveness as a dependent variable, the research has aimed to provide major insights into the practical implications of AI adoption in HR and its potential to transform the HR functions in UAE public sector organisations.

4.9 Ethical Considerations

Ethical considerations are of utmost importance in this research. By adhering to ethical guidelines, researchers can ensure that their outcomes uphold higher levels of dignity and rights of the participants, while preserving the objectivity of the research process, and in the process the research can be advanced.

Obtaining the informed consent from each participant in this research has been one of the most crucial ethical criteria that has been considered. Prior to agreeing to participate in the study, potential responders have been completely informed about the objectives, methods, potential risks, and rewards associated with the research (Gupta, 2013). Participants in this study are employees in the federal government sector of the UAE. They have been made aware that their participation in the study would be entirely voluntary and that they could leave or withdraw from the process at any time without facing any repercussions. The procedure of taking consent from them has respected the autonomy of the participants in choosing whether or not to participate and has also guaranteed that they are fully informed about the nature of their involvement (Taherdoost, 2022; Gupta, 2013).

Confidentiality and anonymity are further essential elements of ethics in research, especially when sensitive subjects like workplace dynamics and the application of AI in HR procedures are being studied.

In considering data from participants, this research has therefore ensured that the identities of the participants remain anonymous. To avoid identification of specific participants, no personal information has been gathered. Moreover, confidentiality of all data has been ensured by safely storing the collected data and limiting the access to the research team exclusively (Dougherty, 2021). By taking these precautions, participants can be said to have been protected from any form of adverse effects that could have occurred if their identities would be revealed, such as biased hiring practices or other changes in workplace dynamics (Kang & Hwang, 2023).

In ensuring the ethical practices in the study, another core factor that has been taken care of is the minimisation of harm to all participants. Care has been taken in this study to ensure that the participants do not suffer any physical, psychological, or emotional harm as a result of the research or their participation in it. Invading or

misleading questions that could cause any form of discomfort or suffering to the participants, have been completely avoided while designing the developing the survey process and the questionnaire. The study has also ensured that the collected data has not been misinterpreted or utilised to draw any inaccurate conclusions; rather, it has been used exclusively for the purpose of the research and to address the specific objectives of the study (Gencten, 2021).

Transparency and adherence to data integrity have also been necessary for conducting this research ethically. Strict guidelines for data collection, processing, and reporting have therefore been followed in this study. Objective data collection and analysis have been conducted without the use of manipulation so that the desired outcomes could effectively be obtained. Maintaining transparency has required precise documentation of the data collection procedures, analytical methods, and the overall methodology that has been considered in this research (de Lucena Alves & da Costa, 2021).

4.10 Chapter Summary

This methodology chapter has described the systematic technique that has been used to examine the effects of predictive AI analysis and AI-measured key performance indicators (KPIs) on HR effectiveness in the UAE public sector. The chapter has offered a complete description of the research design, data collection methods, sampling strategy, and analytical methodologies that have been designed and employed in this study, hence supporting the decisions made in alignment with the context of the research objectives.

The chapter started by establishing the research philosophy, with positivism being considered as the fundamental research paradigm to support and guide the methodology of the study. Positivism has been chosen as it emphasises visible, measurable events and is consistent with the objectives of the research to objectively assess the influence of AI on HR effectiveness based on quantitative research. This methodology has thus allowed for the application of quantitative approach, which has ensured that the conclusions are empirically supported and hence been able to be generalised to the broader research population.

Following the explanation of the research philosophy, the chapter has then expanded on the deductive research approach that has been used in this study. Deduction has been chosen as it makes it easier to examine pre-existing theories by formulating hypotheses that are then empirically tested. This technique has been found to be consistent with the positivist approach of the study and has aimed to evaluate the relationship between AI implementation and HR effectiveness, while also reflecting on the mediating influences of the factors of implementation efficiency and employee readiness.

The use of a quantitative research design has then been described, emphasising its suitability for the objectives of this research. A quantitative design has been employed as it produces measurable and statistically significant data that can be used to derive broad generalisations. The design has allowed for the use of organised surveys to collect the research data, which has then been analysed to evaluate and test the hypotheses. This method has been considered as most appropriate considering the focus of the research on determining the scope and impact of AI integration in HR operations among a large sample of UAE public sector.

In terms of data collection, the study has used standardised, closed-ended questionnaires which have been distributed to the selected group. This method has been chosen as it has been found to be efficient at collecting large volumes of data in a standardised format, thereby allowing for easier statistical analysis later. The questionnaires have been created based on the knowledge gained from existing literature and has been customised to the specific context of AI adoption in HR. Finally, the collected data has been analysed using the PLS-SEM technique which has been found to be most suitable to establish the correlations between the research variables.

Chapter Five: Data Analysis

5.1 Introduction

This chapter is an in-depth review of the data collected to test the model and hypotheses of the study. The analysis is done in multiple steps to guarantee the quality of the dataset as well as the strength of the statistical findings. The chapter starts with a review of the demographic structures of respondents, which is necessary to understand the findings. This is then followed by a comprehensive data preparation and screening procedure, which takes care of missing data, suspicious response patterns, outliers, the assumption of the normal distribution, linearity, and singularity. Such steps are required to ensure that the dataset can be subjected to high-level multivariate analysis.

Then, descriptive statistics are provided to summarize the answers to the survey questions and provide an initial understanding of how the participants perceive the main constructs: Predictive AI Analysis (PAI), AI-measured KPIs, Employee Readiness (ER), Implementation Efficiency (IE), and HR Effectiveness (HR). In this section, general trends and the ranking of responses are identified. To increase the reliability of the results, the possibility of a common method bias (CMB) is analyzed before the evaluation of the model. The measurement model is then tested to assess reliability, validity, convergent and discriminant validity, to ensure that the constructs are appropriately measured.

The prognostic (structural) model is then evaluated to identify the strength and significance of the relationships among the constructs and the power of the model. Lastly, the bootstrapping method of hypothesis testing in SmartPLS is applied to determine the direct and indirect (mediating) effects to have a clear picture of the relationship between PAI and KPIs and HR effectiveness via ER and IE. This chapter logically advances the first stage of data screening to more sophisticated stages of hypothesis testing, which assures both that the results are statistically sound and pertinent to the study goals. The discussion and interpretation in Chapter Six are based on these results.

5.2 Demographic Profiles

Table (5 - 1): Socio demographic details

Question	Category	Frequency	Percent
Q1. What is your gender?	Male	84	31.0%
	Female	187	69.0%
Q2. Which age group do you belong to?	Less than 25 years	57	21.0%
	25–35 years	80	29.5%
	36–45 years	86	31.7%
	46–55 years	34	12.5%
	More than 55 years	14	5.2%
Q3. What is your educational qualification?	High School	52	19.2%
	Graduate	80	29.5%
	Diploma	63	23.2%
	Post-graduate	44	16.2%
	PhD	1	0.4%
	Others	31	11.4%
Q4. How long have you been working in your current organisation?	Less than 3 years	37	13.7%
	3–5 years	94	34.7%
	6–8 years	56	20.7%
	More than 8 years	84	31.0%
Q5. What is your current role in HR?	Junior employee	5	1.8%
	Supervisor	58	21.4%
	Manager	80	29.5%
	Senior management	44	16.2%
	Leadership	84	31.0%
	Total	**271**	**100%**

Sources: developed by the authors

The demographic profile of the respondents reveals that the majority were female (69%), and the rest were male (31%). In terms of age, the largest group was

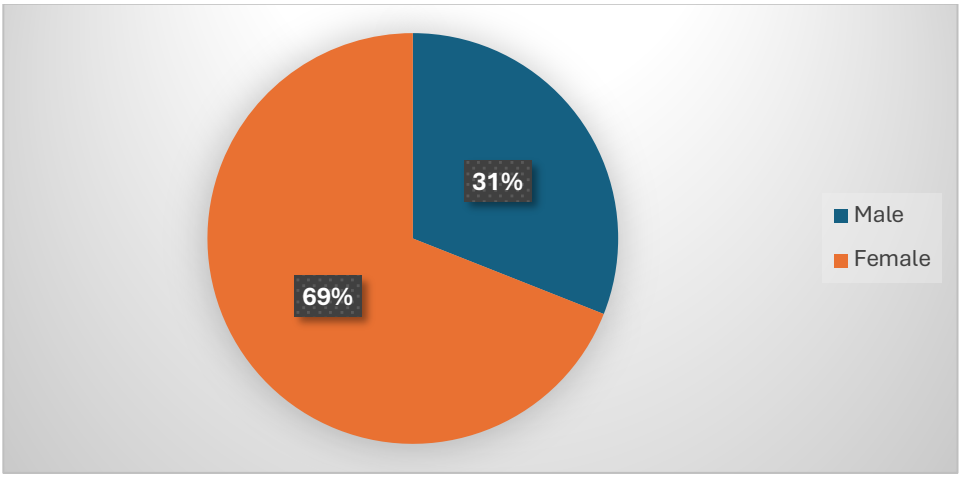
those aged 36–45 years (31.7%), followed by respondents aged 25–35 years (29.5%) and those aged less than 25 years (21%). A smaller proportion of participants were in the 46–55 age group (12.5%), while only 5.2% were above 55 years.

In terms of educational level, the most common was a graduate degree (29.5%), followed by diploma holders (23.2%) and high school graduates (19.2%). Respondents with postgraduate-level qualifications constituted 16.2%, and only 0.4% held a PhD; 11.4% reported having other qualifications.

In terms of work experience in their current organisation, the largest number of respondents had been employed for 3–5 years (34.7%), followed by those with more than 8 years of experience (31%). Meanwhile, 20.7% had been working for 6–8 years, and 13.7% for less than 3 years.

The biggest groups regarding HR job roles were leadership roles (31 %) and managers (29.5 %), and then supervisors (21.4 %). The senior management represented 16.2%, and only a small portion of it included junior employees (1.8%).

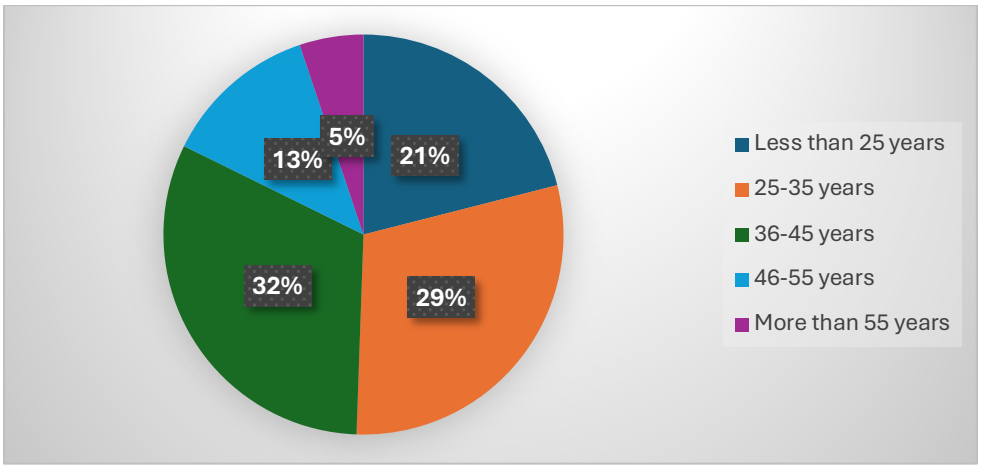
Figure (5- 1): Gender of Respondents



Sources: developed by the authors

The gender distribution shows that most of the respondents were females (69%), whereas only 31% were male. This demonstrates greater involvement of women in the sample of the study.

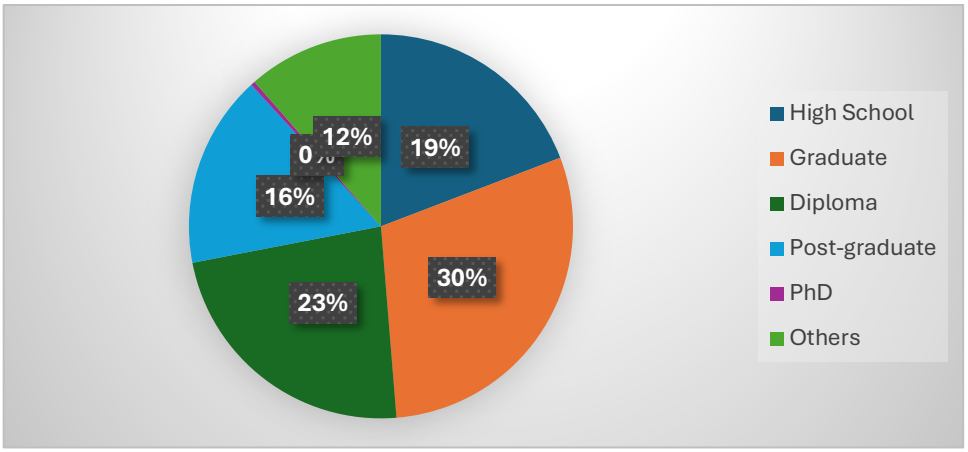
Figure (5- 2) : Age Group of Respondents



Sources: developed by the authors

Most of the respondents were between the ages of 36 - 45 years (31.7%), then those between 25 - 35 years of age (29.5%). A notable proportion were less than 25 years (21%), while smaller groups were aged 46–55 years (12.5%) and more than 55 years (5.2%).

Figure (5- 3): Educational Qualification of Respondents

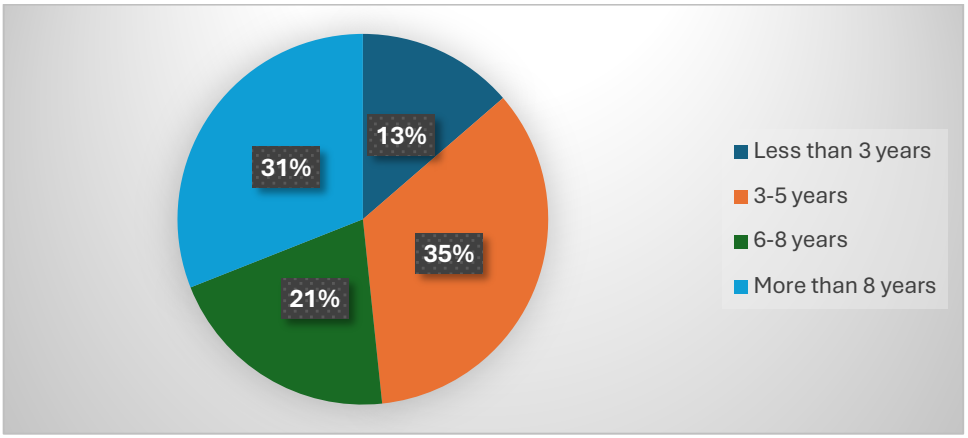


Sources: developed by the authors

In terms of Educational Qualification of Respondents, the largest group were graduates (29.5%), then diploma holders (23.2%) and high school graduates (19.2%).

Also, 16.2% had post-graduate qualifications, 0.4% held a PhD, and 11.4% had other qualifications.

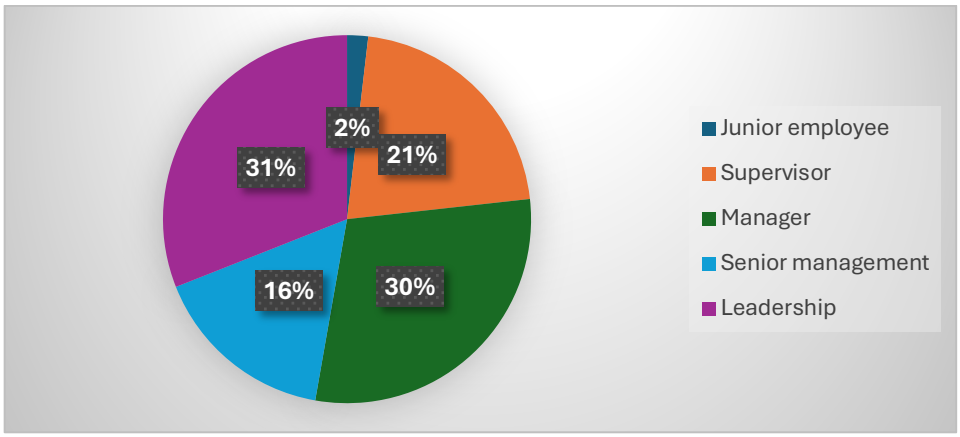
Figure (5- 4): Work Experience in Current Organisation



Sources: developed by the authors

Regarding Work Experience in Current Organisation, the highest proportion of respondents had been working for 3–5 years (34.7%), then those with more than 8 years of experience (31%). Others reported 6–8 years (20.7%) and less than 3 years (13.7%) in their current organisation.

Figure (5- 5): Current Role in HR



Sources: developed by the authors

Most of the respondents, when asked about their role, most respondents identified as being in leadership (31%) or managerial roles (29.5%). A significant percentage were supervisors (21.4%), and 16.2% were senior management. Only a small percentage were junior employees (1.8%).

5.3 Data Preparation and Screening

Before making any statistical calculations, screening, editing, and preparing the data are all important steps of quantitative research. These steps are made to keep the dataset devoid of significant mistakes, inconsistencies, and irregularities that can affect the reliability and validity of the findings. Data preparation is crucial for minimizing bias and enhancing the validity of future findings, thereby strengthening the credibility of the study (Hair et al., 2010).

Data screening is a critical stage in identifying possible breaches of assumptions that lie behind statistical methods. The absence of data, outliers, anomalous response patterns, and atypical data distributions needs to be addressed before implementing advanced statistical models. These issues, as Kline (2005) points out, can merely bias the estimates of parameters and negatively affect the ability to interpret the findings. Proper data preparation is the systematic process of organizing, cleaning, and analyzing the data to verify that the data satisfies the assumptions of statistics and protects the integrity of the results.

In the present research, particular focus was made on defining any missing data, verifying the presence of careless or suspicious response patterns, identifying outliers, and verifying the normality assumption. All these procedures were performed in a systematic way with the help of the statistical software (SPSS) and with references to the pre-existing guidelines in the methodological literature (Kline, 2005; Hair et al., 2010). The research laid a strong ground base on the successive analyses and strengthened the research findings by scrupulously attending to the data preparations and screening.

5.3.1 Missing Data

Missing data is one of the most prevalent problems in quantitative research and can have a detrimental impact on the validity, accuracy, and applicability of findings (Little and Rubin, 2019). Data can be missing due to a variety of reasons, which include participant non-response, non-responses on specific questions, attrition, or errors in data entry (Schafer and Graham, 2002). The lack of information reduces the power of statistics, introduces biases to the parameter estimates, and may provide incorrect conclusions, unless adequately considered (Sterne et al., 2009).

Researchers have designed various methods of dealing with missing data. One classic approach is the list-wise deletion, also known as complete-case analysis, in which any observation with a missing value is removed from the analysis. It is easy to apply, but the method reduces the effective size of the sample and may produce biased estimates in cases where the data is not missing at random (Little, 2019). Imputation is also another popular strategy in which missing values are filled in with reasonable estimates. These techniques include mean imputation, regression imputation, and other advanced techniques like multiple imputation that produce a series of impounded data sets to assist in explaining the uncertainty created by the missing values (Sterne et al., 2009). The more accurate parameter estimates can also be obtained by using model-based procedures, including Maximum Likelihood Estimation (MLE) and Expectation-Maximisation (EM) algorithms with the missing data explicitly included in the statistical model.

The methodology to be used in research must be based on the nature, mechanism, and pattern of missing data (Schafer and Graham, 2002). List-wise deletion was used in the current study as a method of dealing with missing data; thus, only complete cases were analyzed. Although this method was feasible and comparatively easy to implement, its limitations are also acknowledged; in particular, it can reduce the statistical power and even be biased in the case when the missingness assumption is not satisfied and there is a violation of the randomness assumption. However, the method was considered appropriate since the missing data were relatively low in the dataset.

5.3.2 Suspicious Response Patterns

Another important problem that may affect the quality and reliability of quantitative data is the patterns of suspicion. Such trends are often due to careless or insensitive reactions, wherein the respondents do not meaningfully interact with the survey instrument (Meade and Craig, 2012). Cases may include straight-lining (the same option on an item-by-item basis), random answering, inconsistent answering to logically related questions, or answering in excruciatingly short times. Such reactions are very risky as they can introduce systematic errors to the data set and conceal actual associations between variables (Huang et al., 2012).

Several approaches are typically used to identify suspicious response patterns. A time-based check, e.g., clicking a response that is filled out in an unnaturally short period of time, is a signal of shallow engagement. Consistency checks can be used to demonstrate which responses contain contradictions and uniformity, suggesting a straight lining can be developed based on statistical tests such as the longstring analysis or response variance (Johnson, 2005). Attention-check questions incorporated in the survey may also be used by researchers to identify respondents who are not paying attention and those who are.

Meade and Craig (2012) conclude that patterns of suspicious response compromise the reliability of research findings because they create noise and artificial variance. So, it is necessary to detect and eliminate such cases to preserve the integrity of data. In the present study, data were critically analyzed to find indicators of careless responding. Uniform answer pattern. Responses whose pattern of answers showed uniformity or whose time to answer was well below the expected threshold were marked suspicious and not further analyzed. This was intended to safeguard the quality of the data and make the results more reflective of what the real participants thought.

5.3.3 Outliers

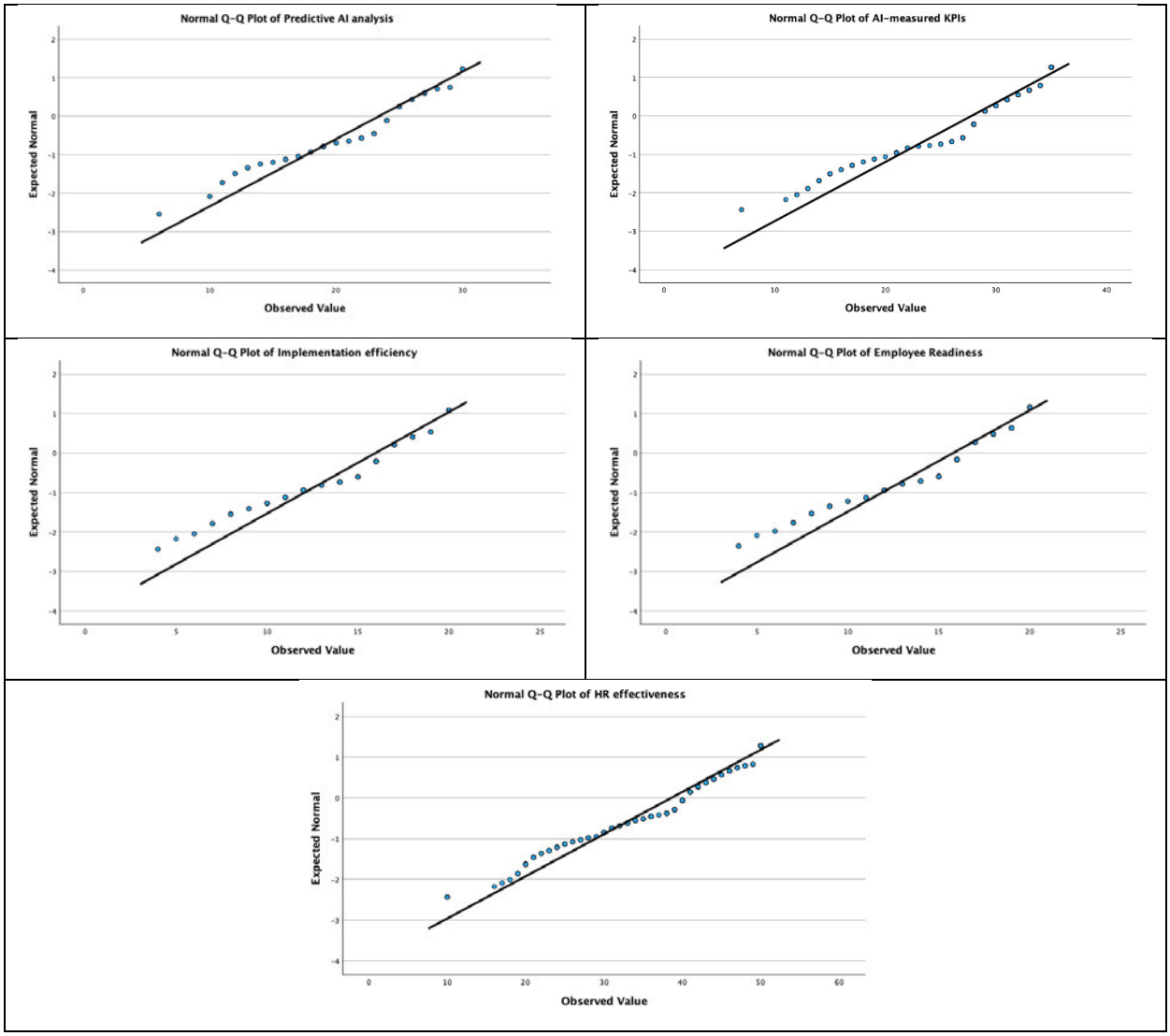
Another factor that should be considered when screening data is the existence of outliers. According to Barnett and Lewis (1994), outliers are defined as observations

that do not represent the general behavior of the data. There are several sources of outliers, such as data entry mistakes, measurement error, or real but extreme values in the population. When outliers are not attended to, they will distort the statistical tests, inflate error values, bias the parameter estimates, and violate the normality and homoscedasticity (Osborne and Overbay, 2004). Therefore, they should be detected carefully and treated as a key part of the data preparation.

Various strategies can be used to determine outliers. Graphical approaches can present visual evidence of extreme values as boxplots, histograms, and scatterplots, and more formal tests can be expressed as statistical values, e.g., z-scores and Mahalanobis distance (Tabachnick and Fidell, 2013). The selection of the method of detection is determined by the nature of the analysis and the assumptions underlying the statistical methods that have been applied. When found, outliers can then be treated in a variety of ways: they may be retained as valid but extreme cases; the data may be rescaled to minimize their impact; or the outliers can be dropped because they are deemed to be due to error, or they have an unduly large impact on the result.

The decision to include outliers will have to be made with care and transparency, as Osborne and Overbay (2004) argue that it is necessary to balance the risk of protecting data integrity against the risk of losing valuable information that can be helpful. In the present research, we have identified the outliers using both the graphical and standardized z-scores. Other outliers were kept maintaining the natural variability of the dataset, where they were considered true extreme values. But when they seemed to be caused by entry errors or artificial trends, they were removed to avoid unnecessary bias in the following analyses.

Figure (5- 6): Normal Q-Q Plot of Predictive AI analysis, AI-measured KPIs, Implementation efficiency, Employee Readiness, HR effectiveness



Sources: developed by the authors

Figure (5-6): Normal Q-Q Plots represent the quantile-quantile plots of the study variables: Predictive AI Analysis, AI-measured KPIs, Implementation Efficiency, Employee Readiness, and HR Effectiveness. Q-Q plots are a visual representation approach to determine whether the distribution of a variable is close to a normal distribution, whereby the observed quantile values are plotted on the horizontal axis and the quantile values expected in a normal distribution appear on the vertical axis (Ghasemi and Zahediasl, 2012).

The data points for the five variables tend to follow the diagonal reference line in each plot, but there is some slight deviation at the tails. These deviations show minor deviations from absolute normality, especially at the ends of the distributions. These minor deviations, however, are typical in a social science study and do not necessarily imply a problem, particularly when working with PLS-SEM, which does not require adherence to strict normality (Hair et al., 2017).

The Q-Q plots are used to complement the statistical tests of normality (Kolmogorov-Smirnov and Shapiro-Wilk), as it is possible to evaluate the distributional features with the help of the numerical color. Although the tests showed a large degree of non-normality, the Q-Q plots show that most of the data is located relatively near the expected normal distribution line, indicating that the data does not have extreme skewness or kurtosis that would bias the PLS-SEM analysis.

Overall, the Q-Q plots indicate that the data can be used in the PLS-SEM analysis because the insignificant non-compliance with the normality is unlikely to influence the estimation of the path coefficients or the validity of bootstrapped confidence intervals adopted to test the hypothesis.

5.3.4 Normality

Data preparation involves testing whether data is normally distributed, as a lot of parametric statistical tests, like regression analysis and structural equation modeling, are all based on the assumption that data is normally distributed (Kline, 2005). A test of hypotheses may be affected by an aberration of normality, which increases type I or type II errors, which will invalidate the conclusions (Hair et al., 2010). Normality assessment thus aids in deciding whether the parametric assumptions are satisfied or otherwise, alternative processes like transformations of data or non-parametric processes need to be applied.

There are quite a few ways of measuring normality. The Shapiro-Wilk and Kolmogorov-Smirnov statistical tests are often applied to test deviations from a normal distribution (Ghasemi and Zahediasl, 2012). The skew and kurtosis values are additional indicators of descriptive statistics, and the values within the range of ±2 can

be acceptable as indicators of normality in large samples (Kline, 2005). Visual techniques such as histograms, P-P plots, and Q-Q plots provide additional information about the form of the distribution and can serve to supplement statistical tests.

Hair et al. (2010) also note that the use of statistical tests is problematic, especially when dealing with a large amount of data, as any small anomaly is pronounced as significant. Therefore, statistical and graphical approaches should be used together most of the time. In the current research, both descriptive (skew and kurtosis) and visual plots were used to determine normality. The findings showed that most of the variables were within acceptable ranges, but there were some slight deviations. Since parametric tests are resistant to small to medium degrees of norm violations in large samples, no transformations were considered essential, and the data were stored in their raw form to be analyzed later.

Table (5- 2): Normality Tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Predictive AI analysis	.196	271	<.001	.895	271	<.001
AI-measured KPIs	.207	271	<.001	.883	271	<.001
Implementation efficiency	.208	271	<.001	.870	271	<.001
Employee Readiness	.219	271	<.001	.875	271	<.001
HR effectiveness	.155	271	<.001	.916	271	<.001

a. Lilliefors Significance Correction

Sources: developed by the authors

Table (5-2): Normality Tests shows the outcome of both the Kolmogorov-Smirnov and Shapiro-Wilk tests performed to determine whether the variables of the study are normally distributed. The tests are widely used in quantitative studies when the assumption of normality, on which many parametric statistical procedures are based, is to be tested (Ghasemi & Zahediasl, 2012).

The findings show that all five variables of Predictive AI Analysis, AI-measured KPIs, Implementation Efficiency, Employee Readiness, and HR Effectiveness all produced significant values ($p < .001$) in the Kolmogorov-Smirnov v Shapiro-Wilk tests. The null hypothesis of normality is rejected, since the significance level of all the variables is lower than the traditional value of 0.05, which indicates that the distributions of these variables are significantly non-normally.

These findings suggest non-normality; however, it is worth mentioning that with large samples, as in this case ($N = 271$), normality tests are highly sensitive and can be used to declare even minor deviations as significant (Tabachnick and Fidell, 2013). In turn, the use of these tests can only result in the overestimation of the normality violation. Thus, it is frequently suggested that these findings should be supplemented with descriptive values of skewness and kurtosis, and visual analyses using histograms and Q-Q plots should be carried out to give a more balanced interpretation (Kline, 2005).

In such a large sample as in this study, and as is standard in Hair et al. (2010), the small violations of normality should not have a significant impact on the strength of parametric tests, including regression and structural equation modelling. In that way, even with the statistical significance of the normality tests, the data were considered acceptable in terms of further parametric analyses without any transformations.

5.3.5 The Importance of Linearity and Singularity in Multiple Variable Analysis

When analyzing relationships among constructs in a research model, it is necessary to follow the principle of linearity, especially when analyzing the results of multiple variables. Linearity is an assumption that shows that a straight-line trend can accurately model the relationships among the variables, and the researchers can make reliable interpretations of the direction and the intensity of the association (Tabachnick and Fidell, 2007). On the other hand, singularity (or extreme multicollinearity) may pose an analytical problem, because it does not allow the model to identify the

distinctive effect of strongly correlated variables, triggering an unstable coefficient and inflated standard errors (Hair et al., 2010).

The evaluation of linearity is done based on the correlations of the independent variables. Where correlations are strong, the relationship may be meaningful, but where the correlation is too large, it is possible that multicollinearity is present, and the results of regression-based analysis are less stable and interpretable. Although the approach is less sensitive to multicollinearity than the normative regression in PLS-SEM, it is still crucial to make sure that highly correlated predictors do not skew the estimation of path coefficients.

Linearity and possible singularity were also assessed in the current study with the bivariate correlation matrix in Table 5-3. The correlation coefficients calculated by Pearson were tested to define whether two variables were above the suggested value of 0.90 to define multicollinearity. It is found that all the correlations are found to be strong and significant at the 0.01 level and are observed to be between 0.680 to 0.881, and none surpasses the value of 0.90. Particularly, the strongest connections can be traced between HR Effectiveness and Predictive AI Analysis (r = 0.807) as well as AI-measured KPIs (r = 0.749), Implementation Efficiency (r = 0.684), and Employee Readiness (r = 0.680). The strongest correlation between independent variables is between Implementation Efficiency and Employee Readiness (r = 0.881), which is not above the critical threshold.

These results suggest that positive and significantly correlated but non-singular study variables do exist. Thus, the assumption of linearity can be deemed as met, which in turn confirms the stability and reliability of the multiple variable analyses that were performed in SmartPLS. These findings give confidence that independent variables can be incorporated in the structural model without fear of high multicollinearity and, therefore, valid path estimates that can be interpreted.

Table (5 - 3): Bivariate correlations between variables

	HR effectiveness	Predictive AI analysis	AI-measured KPIs	Implementation efficiency	Employee Readiness
HR effectiveness	1				
Predictive AI analysis	.807**	1			
AI-measured KPIs	.749**	.835**	1		
Implementation efficiency	.684**	.795**	.876**	1	
Employee Readiness	.680**	.789**	.849**	.881**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Sources: developed by the authors

Table (5-3) includes the bivariate correlations between the study variables: HR Effectiveness, Predictive AI Analysis, AI-measured KPIs, Implementation Efficiency, and Employee Readiness. The table indicates strong correlations between the constructs as all of them are statistically significant at the 0.01 level (2-tailed).

In particular, the strongest correlations are between HR Effectiveness and Predictive AI Analysis ($r = 0.807$, $p < 0.01$); AI-measured KPIs ($r = 0.749$, $p < 0.01$); Implementation Efficiency ($r = 0.684$, $p < 0.01$); Employee Readiness ($r = 0.680$, $p < 0.01$). These results indicate that the increase in predictive AI stability, using KPIs to measure performance, effective implementation practices, and employee preparedness, are all interconnected with high levels of HR effectiveness.

The associations between the independent variables are also very strong. As an example, Predictive AI Analysis has a correlation with AI-measured KPIs ($r = 0.835$, p under 0.01), Implementation Efficiency ($r = 0.795$, p under 0.01), and Employee Readiness ($r = 0.789$, p under 0.01). Likewise, the highest correlation can be observed between Implementation Efficiency and Employee Readiness ($r = 0.881$, $p < 0.01$), indicating that the workforce is well prepared to implement AI-based strategies and that these strategies yield the highest outcomes.

These large and strong correlations reflect the theoretical predictivity that the measured variables are related and may jointly contribute to HR effectiveness.

Nevertheless, the high correlations also suggest that multicollinearity may occur, and it needs to be evaluated in the further PLS-SEM analysis to derive the credible path coefficients. Comprehensively, the findings demonstrate the existence of significant correlations between the variables and offer a solid foundation to test the hypotheses of the study with the help of SmartPLS.

5.4 Descriptive Statistics

In this section, the measurement scales adopted in the study are described in the way they were perceived by the respondents in relation to the main constructs of the research model, such as HR Effectiveness, Employee Readiness, Implementation Efficiency, AI-measured KPIs, and Predictive AI Analysis (PAI). The data were gathered through a form of survey, the questions were measured on a five-point Likert scale, where 1 refers to strongly disagree and 5 strongly agree.

The descriptive analysis gives an account of the perceptions and attitudes of the participants in the study on the constructs being studied. The mean scores show the average score of all responses to each of the items and represent the central tendency of the opinions of the respondents. Standard deviations (SD) indicate the variability of responses, which indicates the extent of differences among the views of the participants as compared to the mean. Combined, these statistics present a clear view of the general orientation and agreement in the dataset.

In order to further interpret the results, the level of agreement of each item is categorized according to the following scale: 1-1.79 = Very Low, 1.8-2.59 = Low, 2.6-3.39 = mediate, 3.4-4.19 = High, and 4.2-5 = Very High. By introducing the descriptive statistics and this degree classification, the reader can see not just the average answers, but the degree to which the participants agree or disagree with the idea of adopting AI and its effect on the HR practices. To illustrate, better mean scores on those items, which relate to task automation, performance management, and employee engagement, mean that respondents believe AI is especially useful in advancing operating and strategic HR roles, which are rated as a “High” or “Very

High" degree. On the other hand, elements of AI revolutionizing HR processes have slightly lower mean scores, which are considered more mediates areas of perception.

The descriptive analysis provides a base of understanding of the dataset, which illuminates the attitudes of the participants toward the use of AI in HR practice and contextualizes the further analysis, such as the measurement and structural model analyses. In the tables below, the mean, SD, rank, and degree values of all questionnaire items in the constructs studied were summarized.

Table (5- 4): Items Mean Scores of HR effectiveness.

Statements	Mean	Std. Deviation	Rank	Degree
1. AI is revolutionising HR processes in your organisation.	3.64	1.224	10	High
2. The role of AI is highly important in the HR effectiveness in your organisation.	3.81	1.192	8	High
3. AI is highly effective in streamlining and automating HR activities in your organisation.	3.87	1.18	6	High
4. AI is highly effective in enhancing employee engagement through HR activities in your organisation.	3.83	1.166	7	High
5. HR strategy management is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.89	1.115	5	High
6. Employee engagement is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.9	1.111	4	High
7. Performance management is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.93	1.113	3	High
8. Learning and development is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.94	1.124	2	High
9. Task automation is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.98	1.064	1	High
10. Employee retention is the most significant benefit of AI in enhancing HR effectiveness in your organisation.	3.81	1.134	9	High
General mean	**3.86**	**1.14**		

Sources: developed by the authors

The table (5-4) shows the perception of the respondents regarding the effect of AI on HR effectiveness. The general mean of 3.86 with a standard deviation of 1.14 indicates that the participants largely agree on whether AI is a positive contribution to HR processes. The highest-rated statement, “Task automation is the most significant benefit of AI in enhancing HR effectiveness in your organisation,” indicating the respondents see AI as most effective at automating routine HR tasks. The second-ranked statement, “Learning and development is the most significant benefit of AI in enhancing HR effectiveness in your organisation,” had a mean of 3.94, hich was a fair reflection of the acknowledgment by respondents of how AI has contributed to employee training and development programs.

The third-ranked item, “Performance management is the most significant benefit of AI in enhancing HR effectiveness in your organisation,” scored 3.93, which shows that AI is also appreciated as an enhancement of HR performance evaluation procedures. Next in rank came the fourth-ranked statement, “Employee engagement is the most significant benefit of AI in enhancing HR effectiveness in your organisation,” received a mean of 3.90, revealing that AI is seen as promoting engagement in response to HR programs. The fifth-ranked statement, “HR strategy management is the most significant benefit of AI in enhancing HR effectiveness in your organisation,” scored 3.89, showing the strategic importance of AI in aiding HR planning and decision-making.

The sixth and seventh-ranked items, “AI is highly effective in streamlining and automating HR activities in your organisation” (3.87) and “AI is highly effective in enhancing employee engagement through HR activities in your organisation” (3.83), reinforce the view that AI improves both operational efficiency and employee experience. The eighth-ranked statement, “The role of AI is highly important in the HR effectiveness in your organisation,” scored 3.81, indicates a mediately strong (with consistent scores) perception of the importance of AI in HR, overall. Similarly, “Employee retention is the most significant benefit of AI in enhancing HR effectiveness in your organisation” also scored 3.81, indicating that AI is somewhat less associated with retention compared to other HR outcomes.

Finally, the lowest-ranked item, "AI is revolutionising HR processes in your organisation," received a mean of 3.64, indicating that although the respondents recognise the importance of AI in enhancing the HR processes, they believe that the transformative effect is a little bit less strong. Overall, these findings suggest that the overall perception of AI impact on HR effectiveness is quite favorable, and the most noticeable areas of this impact are task automation, learning and development, and performance management.

Table (5- 5): Items Mean Scores of Predictive AI analysis (PAI)

Statements	Mean	Std. Deviation	Rank	Degree
1. Predictive AI is highly effective in enhancing HR effectiveness in your organisation.	3.82	1.219	6	High
2. Employee data analysis is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?	3.94	1.092	1	High
3. Talent acquisition is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?	3.94	1.029	2	High
4. Forecasting employee performance is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?	3.94	1.082	3	High
5. Strategic workforce planning is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?	3.85	1.123	5	High
6. There are significant challenges faced from the employees and HR teams in your organisation to undertake Predictive AI Analysis in HR.	3.9	1.069	4	High
General mean	**3.90**	**1.10**		

Sources: developed by the authors

The table (5-5) shows the perception of the respondents regarding the impact of Predictive AI (PAI) on HR effectiveness. The general mean of 3.90 with a standard deviation of 1.10 demonstrate a high degree of consensus among the participants in the

question of the positive role of Predictive AI in improving HR processes. The highest-ranked statements, “Employee data analysis is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation,” “Talent acquisition is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation,” and “Forecasting employee performance is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation,” all received a mean of 3.94, which means that the respondents saw these areas as the most effective use of Predictive AI in HR functions.

Next, the fourth-ranked statement, “There are significant challenges faced from the employees and HR teams in your organisation to undertake Predictive AI Analysis in HR,” scored 3.90, indicating that, although Predictive AI is widely appreciated, there is some awareness by respondents of the challenges that may be encountered in implementing it. The fifth-ranked item, “Strategic workforce planning is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation,” received a mean of 3.85, indicates the perceived usefulness of Predictive AI in helping HR be more effective in your organisation over the long term. The sixth-ranked statement, “Predictive AI is highly effective in enhancing HR effectiveness in your organisation,” scored 3.82, which shows a slightly lower, but still good agreement on the overall effectiveness of Predictive AI.

In general, these findings indicate that respondents overall hold a positive view of Predictive AI in HR, and the analysis of employee data, talent acquisition, and performance forecasting are seen as the main areas where Predictive AI is viewed as adding value. Simultaneously, the issue of implementation is also identified, and the perspective on both the advantages and the issue of practicality is reflected.

Table (5- 6): Items Mean Scores of AI-measured KPIs (KPIs)

Statements	Mean	Std. Deviation	Rank	Degree
1. AI-measured KPIs are highly effective in enhancing HR effectiveness in your organisation.	3.89	1.144	7	High
2. Performance management is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.	3.93	1.069	6	High
3. Real-time data analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.	4.03	1	2	High
4. Employee satisfaction is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.	4.04	1.046	1	High
5. Data-driven decision making is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.	4.03	1.052	3	High
6. Unbiased employee analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.	3.95	1.06	4	High
7. There are significant challenges faced from the employees and HR teams in your organisation to follow AI-measured KPIs in HR.	3.92	1.094	5	High
General mean	**3.97**	**1.07**		

Sources: developed by the authors

The table (5-6) shows the perception of the respondents regarding the impact of AI-measured KPIs on HR effectiveness. The general mean of 3.97 with a standard deviation of 1.07 indicates that there is a high degree of consensus among participants with respect to the positive impact of AI-measured KPIs on improving HR processes. The statement with the largest score, "Employee satisfaction is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation," received a mean of 4.04, indicating that the respondents see AI-measured KPIs as an effective way to achieve employee satisfaction. Closely following, the second-ranked

statement, “Real-time data analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation,” scored 4.03, indicating that the respondents have recognised the importance of timely and accurate data in decision-making regarding HR in their organisation. The third-ranked statement, “Data-driven decision making is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation,” also scored 4.03, indicating that AI-measured KPIs are considered essential for supporting informed HR decisions.

The fourth-ranked item, “Unbiased employee analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation,” received a mean of 3.95, which emphasised the importance of AI in fostering impartiality and objectivity in HR measurements. The fifth-ranked statement, “There are significant challenges faced from the employees and HR teams in your organisation to follow AI-measured KPIs in HR,” scored 3.92, which indicates that the respondents realise that there are certain practical issues with the implementation of these metrics. The sixth-ranked item, “Performance management is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation,” received a mean of 3.93, supports the significance of AI-measured KPIs in measuring employee performance. The seventh-ranked statement, “AI-measured KPIs are highly effective in enhancing HR effectiveness in your organisation,” scored 3.89, indicating that there is a consensus about the effectiveness of these KPIs in maximising HR improvements.

Overall, these findings indicate that respondents have a positive outlook on AI-measured KPIs in HR, and the areas that have the strongest impact were determined to be employee satisfaction, real-time data analysis, and data-driven decision-making. Concurrently, the recognition of difficulties highlights the realities that organisations need to consider ensuring that they are getting the most out of AI-measured KPIs.

Table (5- 7): Items Mean Scores of Implementation efficiency (IE)

Statements	Mean	Std. Deviation	Rank	Degree
1. The role of implementation efficiency is highly important in AI for HR effectiveness in your organisation.	3.98	1.145	3	High
2. The role of implementation efficiency is highly important in Predictive AI Analysis for HR effectiveness in your organisation.	4.01	1.068	1	High
3. The role of implementation efficiency is highly important in AI-measured KPIs for HR effectiveness in your organisation.	3.96	1.088	4	High
4. The role of implementation efficiency is highly important for effective decision- making in HR.	4.01	1.059	2	High
General mean	**3.99**	**1.09**		

Sources: developed by the authors

The table (5-7) shows the perception of the respondents regarding the role of implementation efficiency (IE) in enhancing HR effectiveness. The general mean of 3.99 with a standard deviation of 1.09 indicates that there is a high consensus among the participants on the significance of implementation efficiency in various AI applications in HR. The highest-ranked statements, "The role of implementation efficiency is highly important in Predictive AI Analysis for HR effectiveness in your organisation" and "The role of implementation efficiency is highly important for effective decision-making in HR," both scored means of 4.01, indicate that the respondents had a strong perception that implementation efficiency is crucial to maximise the benefits of AI in HR decision-making processes.

The third-ranked statement, "The role of implementation efficiency is highly important in AI for HR effectiveness in your organisation," received a mean of 3.98, while the fourth-ranked item, "The role of implementation efficiency is highly important in AI-measured KPIs for HR effectiveness in your organisation," scored 3.96, which represents slightly less, yet high agreement.

Overall, these findings indicate that respondents always view implementation efficiency as an essential component of utilizing AI technologies to enhance HR effectiveness, which is of strategic importance in both predictive analytics and KPI-based performance management.

Table (5- 8): Items Mean Scores of Employee Readiness (ER)

Statements	Mean	Std. Deviation	Rank	Degree
1. The role of employee readiness in AI is highly important for HR effectiveness in your organisation.	3.91	1.146	4	High
2. The role of employee readiness is highly important in Predictive AI Analysis for HR effectiveness in your organization.	3.92	1.084	3	High
3. The role of employee readiness is highly important in AI-measured KPIs for HR effectiveness in your organisation.	4.01	1.056	1	High
4. The role of employee readiness in AI is highly important for effective decision- making in HR.	3.96	1.072	2	High
General mean	3.95	1.09		

Sources: developed by the authors

The table (5-8) shows the perception of the respondents regarding Employee Readiness (ER) in relation to enhancing HR effectiveness through AI initiatives. The general mean of 3.95 with a standard deviation of 1.09 shows that participants were in high agreement about the significance of employee readiness when it comes to supporting the HR process using AI. The highest-rated statement, "The role of employee readiness in AI-measured KPIs for HR effectiveness in your organisation," received a mean of 4.01, indicating that the participants consider readiness to be more important in the effective implementation of AI-based performance measurement systems.

The second-ranked item, "The role of employee readiness in AI is highly important for effective decision-making in HR," scored 3.96, indicating that respondents acknowledge the importance of readiness as a tool in making an informed

and efficient HR decision. Following this, the third-ranked statement, “The role of employee readiness is highly important in Predictive AI Analysis for HR effectiveness in your organisation,” had a mean of 3.92, suggesting its importance in the applications of predictive HR analytics. The fourth-ranked item, “The role of employee readiness in AI is highly important for HR effectiveness in your organisation,” scored 3.91, indicates that although it is generally important, it is seen as less essential than the role it plays in certain AI applications.

Overall, these findings indicate that employee preparedness is viewed as a high-priority aspect of AI-based HR programs, specifically KPIs and decision-making processes.

5.5 Common Method Bias (CMB)

To ensure the validity and reliability of the data, which will be collected, the researchers have taken both statistical and procedural remedies to prevent the influence of the common method bias (CMB) that may occur when the difference in responses can be attributed to the measurement method used and not to the measures being measured. Procedurally, respondents were guaranteed anonymity and confidentiality, which minimized the chances of socially desirable responses anuation apprehension. The items in the questionnaire were also randomized, and varied question formats were used to measure variables to reduce systematic response patterns, which may artificially increase correlations between constructs. At the statistical level, Harman's single-factor test was used as a diagnostic test to determine whether there was a single dominant factor that might be an indication of shared method variance. Results of this test indicated that the variance that the first factor explained was significantly less than the critical value of 50, which implied that CMB was not a major issue in the data set. In addition, to enhance data integrity, outliers and extreme cases were found and eliminated on a conservative significant level of $p < 0.001$, according to the recommendations of Tabachnick and Fidell (2019). These procedural and statistical safeguards ensured that the perceived relationships between the study variables were actual theoretical relationships, and not mere artifacts of the measurement process, thus

increasing the strength and validity of the follow-up analyses performed with the SmartPLS.

5.6 Measurement Model

The measurement model was assessed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique, focusing on the constructs of Employee Readiness (ER), HR Effectiveness (HR), Implementation Efficiency (IE), AI-Measured KPIs (KPIs), and Predictive AI Analysis (PAI). As indicated in the following Table, standardized loadings of all measurement items were satisfactory with scores between 0.771 and 0.884, exceeding the usually recommended standard of 0.70 (Hair et al., 2017). This means that the items are good predictors of their specific latent constructs and that they add value to the scale of the underlying concepts.

Cronbach's Alpha (α) and Composite Reliability (CR) were used to check internal consistency reliability. The Cronbach Alpha of all constructs was above 0.90, and the CR (rho a and rho c) were also above the recommended cut-off point of 0.70. As an example, HR Effectiveness has a value of 0.956 and 0.962 in terms of alpha and CR, respectively; Predictive AI Analysis has a value of 0.932 and 0.947 in terms of alpha and CR, respectively. These findings confirm that the constructs are highly reliable and thus the indicators will always be measuring the target latent variables.

Additional measurement of convergent validity was done using the Average Variance Extracted (AVE). The values of AVE were 0.717 to 0.800, above 0.50 (Fornell and Larcker, 1981). This shows that both constructs explain over half of the variance of their indicators, and hence, convergent validity is confirmed. It is interesting to note that Employee Readiness had an AVE of 0.800, which indicates that its items strongly reflect the underlying construct.

Also, the Variance Inflation Factor (VIF) was used to investigate a problem of multicollinearity. The VIF values were all between 2.016 and 2.992, which is much lower than the conservative cut-off value of 5.0 (Hair et al., 2017). This implies that the issue of multicollinearity does not exist in the measurement model, and every measure does not show any substantial redundancy with the other indicators.

A combination of these findings supports that the measurement model has high levels of indicator reliability, internal consistency reliability, convergent validity, and no multicollinearity. Consequently, the measurement model satisfies the requirements to continue with the assessment of the structural model.

Table (5- 9): Summarization of Composite Reliability, Average variance extracted, Variance inflation factor.

Constructs	Items	Loadings	Cronbach's alpha (a)	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	variance inflation factor (VIF)
Employee Readiness (ER)	**ER1**	0.88	0.917	0.918	0.941	0.8	2.747
	ER4	0.884					2.881
HR effectiveness (HR)	**HR1**	0.771	0.956	0.957	0.962	0.717	2.357
	HR10	0.845					2.992
	HR2	0.819					2.817
Implementation efficiency (IE)	**IE1**	0.849	0.915	0.916	0.941	0.798	2.303
AI-measured KPIs (KPIs)	**KPIs1**	0.775	0.948	0.948	0.957	0.762	2.016
Predictive AI analysis (PAI)	**PAI1**	0.839	0.932	0.933	0.947	0.748	2.473
	PAI2	0.855					2.708
	PAI4	0.868					2.878
	PAI5	0.87					2.874

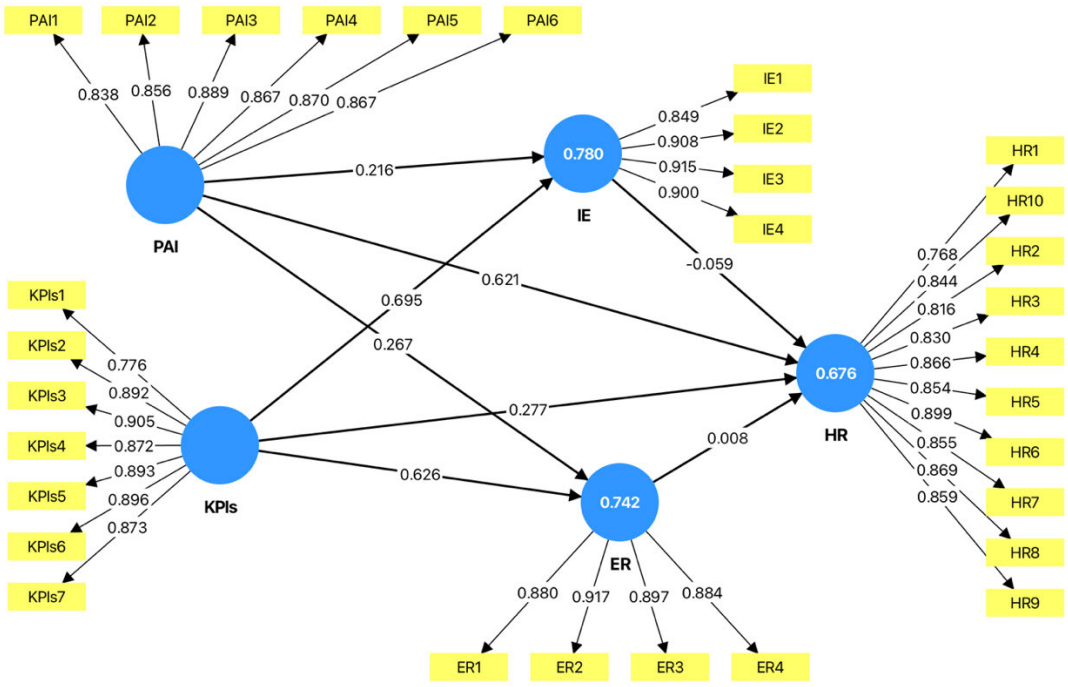
Sources: developed by the authors

Table (5- 10): Outer loading matrix and Variance Inflation Factor (VIF) Values of Measurement Items

Constructs	Items	Factor Loading	VIF
Employee Readiness (ER)	**ER1**	0.88	2.747
	ER2	0.917	3.535
	ER3	0.897	3.121
	ER4	0.884	2.881
HR effectiveness (HR)	**HR1**	0.771	2.357
	HR10	0.845	2.992
	HR2	0.819	2.817
	HR3	0.829	3.137
	HR4	0.865	3.863
	HR5	0.853	3.553
	HR6	0.898	5.269
	HR7	0.853	3.841
	HR8	0.869	3.593
	HR9	0.859	3.558
Implementation efficiency (IE)	**IE1**	0.849	2.303
	IE2	0.908	3.662
	IE3	0.915	4.106
	IE4	0.9	3.188
AI-measured KPIs (KPIs)	**KPIs1**	0.775	2.016
	KPIs2	0.891	4.152
	KPIs3	0.904	4.362
	KPIs4	0.872	3.227
	KPIs5	0.893	4.539
	KPIs6	0.896	4.278
	KPIs7	0.873	3.297
Predictive AI analysis (PAI)	**PAI1**	0.839	2.473
	PAI2	0.855	2.708
	PAI3	0.888	3.432
	PAI4	0.868	2.878
	PAI5	0.87	2.874
	PAI6	0.867	3.035

Sources: developed by the authors

Figure (5- 7): Measurement Model



The factor loading of all measurement items, including their Variance Inflation Factor (VIF) values, is shown in the table. The factor loadings show to what degree each of the observed variables captures its underlying latent construct. In this research, all loadings were greater than the suggested value of 0.70, which validates that the indicators are a good measure of their respective constructs. The internal consistency among the constructs was high with employee Readiness (ER) items loading between 0.880 and 0.917 and HR Effectiveness (HR) items loading between 0.771 and 0.898. Implementation Efficiency (IE) showed excellent loadings of 0.849 to 0.915, and AI-measured KPIs were also reliably loaded with 0.1458 above the cutoff and Predictive AI Analysis (PAI) measurements.

The coefficients of multicollinearity were tested using the values of VIF. All the values fell below the generally accepted value of 5, and therefore, multicollinearity is not a problem in this measurement model. HR6 was the largest at 5.269, which is slightly over the suggested limit, but is acceptable, with all other items clearly under the limit. Taken together, these findings not only support the reliability but also the

discriminant validity of the constructs and offer a strong basis to further examine the structural model.

5.7 Discrimination and validity

The Fornell-Larcker criteria and the Heterotrait-Monotrait ratio (HTMT) were used to determine the level of discriminant validity (as recommended in the PLS-SEM literature), respectively (Fornell and Larcker, 1981; Henseler et al., 2015). The establishment of discriminant validity is an important step in testing a measurement model, where each latent construct is empirically different and measures phenomena that other constructs in the model do not measure. In the absence of discriminant validity, structural analyses could be confounded because it would be unclear as to whether apparent relationships between constructs are real or mere artifacts of measurement overlap. One of the most used methods of evaluating discriminant validity is the Fornell-Larcker criterion, which compares the square root of the average variance extracted (AVE) of each construct with the correlates that construct has with the other constructs in the model. When the square root of the AVE is higher than the inter-construct correlations, the construct is said to share greater variance with its own indicators as compared to the other latent variables, thus proving discriminant validity. nevertheless, owing to certain limitations of the method, including its relatively low sensitivity to identify discriminant validity problems, researchers have stressed the significance of combining it with the HTMT ratio. The HTMT is a more recent and more robust criterion that computes the ratio of between-construct correlations (heterotrait-heteromethod) to within-construct correlations (monotrait-heteromethod) and offers a tighter measure of discriminant validity. When HTMT is under 0.90 (or 0.85 with more stringent criteria), the results are usually acceptable and mean that constructs are different. The combination of the Fornell-Larcker criterion and the HTMT ratio provides more methodological rigor to the analysis to ensure that the constructs of the measurement model have theoretical meaning, are empirically discrete, and can subsequently be tested to examine the structural relationships in the study.

Table (5- 11): Discrimination and validity - Fornell-Larcker Criterion

	ER	HR	IE	KPIs	PAI
ER	0.894				
HR	0.681	0.847			
IE	0.880	0.685	0.893		
KPIs	0.849	0.749	0.875	0.873	
PAI	0.789	0.811	0.795	0.833	0.865

Sources: developed by the authors

The table shows the results of the Fornell-Larcker criterion. The square root of the average variance extracted (AVE) of each construct is provided on the diagonal, and off-diagonal values depict the correlations between the constructs. As per the criterion, the AVE square root should be larger than the correlation to other constructs. In the study, all constructs met this condition. Indicatively, Employee Readiness (ER) provided AVE square root of 0.894, exceeding the predicted square root with its correlated variables: (HR Effectiveness: 0.681), (Implementation Efficiency: 0.880), (AI-Measured KPIs: 0.849), and (Predictive AI Analysis: 0.789). Correspondingly, the square root of the AE of HR Effectiveness (HR) was 0.847, compared to 0.294158 with the other constructs. These findings affirm the discrimination of validity in that each construct has a higher share of variance with its indicators than with the other constructs.

Table (5- 12): Discrimination and validity - Heterotrait - Monotrait Ratio (HTMT)

	ER	HR	IE	KPIs	PAI
ER					
HR	0.726				
IE	0.960	0.730			
KPIs	0.910	0.786	0.940		
PAI	0.852	0.857	0.860	0.886	

Sources: developed by the authors

To further test discriminant validity, the Table was examined using the HTMT ratio. The HTMT is used to determine the level of similarity in constructs, and a value of less than 0.90 (and more conservatively 0.85) is adequate discriminant validity (Henseler et al., 2015). In the present research, the majority of the HTMT values were lower than 0.90, e.g., ER-HR (0.726) and HR-KPIs (0.786), which indicated that there was no discrimination between these two constructs. Nonetheless, there were also other HTMT values close to or slightly above the threshold, e.g., ER -IE (0.960) and KPIs - IE (0.940). Nevertheless, although these values are higher than the conservative cut-off, recent methodological advice states that such discriminant validity can still be accepted when justified by the Fornell-Larcker results and cross-loadings (Hair et al., 2022).

In general, the combination of the Fornell-Larcker criterion and the outcomes of the HTMT creates an acceptable amount of evidence of discriminant validity within the measurement model. Some HTMT ratios were large, but the Fornell-Larcker analysis has ensured that all constructs are related more strongly to their measures than to the other constructs, which ensures that the latent variables are conceptually and empirically different.

5.8 Prognostic Model Assessment

The prognostic power of the structural model was evaluated using both the coefficient of determination (R^2) and cross-validated predictive relevance (Q^2), along with the associated error metrics of Root Mean Square Error (RMSE) and Mean Absolute Error (MAE). All these measures are in addition to the explanatory and predictive power of the model to ensure that, in addition to the variance in the endogenous constructs, the model should show sufficient predictive relevance (Hair et al., 2017).

Table (5- 13): Prognostic Mode Assessment

	RMSE	MAE	R-square	R-square adjusted	Q^2predict	Q2 Effect
ER	0.519	0.320	0.742	0.741	0.736	
HR	0.585	0.366	0.676	0.671	0.664	Large
IE	0.481	0.269	0.780	0.779	0.773	Large

Sources: developed by the authors

Table (5-14) shows the prognostic evaluation of the structural model, which indicates the predictive validity and explanatory capacity of the endogenous variables, that is, Employee Readiness (ER), HR Effectiveness (HR), and Implementation Efficiency (IE). The R^2 values reveal substantial explanatory strength, with Implementation Efficiency demonstrating the highest R^2 of 0.780 (adjusted R^2 = 0.779), indicating that approximately 78% of the variance in IE is explained by the model's predictors. Employee Readiness also showed strong explanatory power with an R^2 of 0.742 (adjusted R^2 = 0.741), indicating that the model is very effective in explaining the factors that affect employee preparedness towards AI-driven HR practices. HR Effectiveness exhibited a mediately high R^2 of 0.676 (adjusted R^2 = 0.671), confirming that the combined influence of ER, IE, and AI-related variables together explains a considerable share of the variation in HR results.

The strength of the proposed framework is also supported by the predictive relevance of the model, which was assessed with Q^2 predict. All the Q^2 values were positive, with the biggest being 0.664, which is the value of HR Effectiveness, and the smallest being 0.773, which is the value of Implementation Efficiency, as the thresholds of large predictive relevance defined by Hair et al. (2022) are 0.35 and below. More specifically, the Q^2 value of both Implementation Efficiency and HR Effectiveness fell in the large effect range, establishing the model as having the ability to make accurate predictions on both constructs.

The modeling reliability is also supported by the evaluation of predictive accuracy based on the value of the RMSE and MAE. Employee Readiness had the next lowest prediction error (RMSE = 0.519; MAE = 0.320), then Implementation Efficiency (RMSE = 0.481; MAE = 0.269), which reflected very stable predictions.

Although with marginally higher error terms (RMSE = 0.585; MAE = 0.366), HR Effectiveness demonstrated satisfactory levels of prediction accuracy.

The findings support the idea that the suggested model has a high explanatory power and has high predictive relevance. The high R^2 and Q^2 values, along with comparatively value MAE, indicate that the model is effectively applicable to explaining and predicting the results associated with adopting AI in HR practices. These results support the theoretical connections supposed within the study and indicate a belief in the practical utility of AI-supported HR interventions in terms of employee preparedness, implementation effectiveness, and overall HR performance.

5.9 Hypothesis Testing

Direct and indirect effects were also used to test the hypothesized relationships in the structural model using PLS-SEM bootstrapping of 5,000 resamples. The analysis was aimed at determining the importance and the strength of the KPIs and Predictive AI Analysis (PAI) to HR Effectiveness, both directly and indirectly via the mediator variables of Employee Readiness (ER) and Implementation Efficiency (IE).

The mediation analysis shows that the structural relationships between predictive AI and KPIs and HR Effectiveness are not only direct but also indirect through the enhancement of employee preparedness and implementation efficiency. The high T-statistics and p-values of bootstrapping offer a high level of empirical evidence on the proposed mediating relationships, which underlines the role of ER and IE as the primary channels through which the predictive analytics leads to improved HR performance. Together, these findings support the theoretical framework and show both the direct and indirect ways in which technology-supported HR measures and predictive AI projects lead to HR performance in companies. The results of the direct path coefficients and mediating effects are summarized in the following tables, which show that the proposed relationships are significant and the mechanisms according to which AI-driven metrics can affect HR outcomes are real.

Table (5- 14): Direct Path Coefficients of Structural Model (Bootstrapping Results)

Direct Effect	Path Coefficient	Standard deviation (STDEV)	T statistics	P values	Hypothesis Status
ER -> HR	0.008	0.106	0.072	0.943	Not Supported
IE -> HR	-0.059	0.111	0.530	0.596	Not Supported
KPIs -> ER	0.626	0.088	7.140	0.000	Supported
KPIs -> HR	0.277	0.126	2.197	0.028	Supported
KPIs -> IE	0.695	0.081	8.567	0.000	Supported
PAI -> ER	0.267	0.089	2.999	0.003	Supported
PAI -> HR	0.621	0.105	5.893	0.000	Supported
PAI -> IE	0.216	0.079	2.724	0.006	Supported

Sources: developed by the authors

Table (5-15) presents the direct path coefficients for the proposed structural model, derived from bootstrapping results. These coefficients give us in-depth observation of the direct impact of the study constructs Employee Readiness (ER), Implementation Efficiency (IE), AI-measured Key Performance Indicators (KPIs), and Predictive AI Analysis (PAI) on the HR Effectiveness (HR), as well as the relationship between the predictor variables themselves. The path coefficients, standard deviations, t-statistics, and p-values are all included in the table, which is critical in determining the statistical significance and strength of the hypothesized relationships.

The analysis reveals that AI-measured KPIs significantly influence both Employee Readiness ($\beta = 0.626$, $t = 7.140$, $p < 0.001$) and Implementation Efficiency ($\beta = 0.695$, $t = 8.567$, $p < 0.001$). Such robust positive outcomes suggest that companies that use AI-based performance indicators can significantly increase employee readiness to AI-powered operations and streamline the effectiveness of HR programs implementation. The t-values and particularly the p-values are very small, indicating that not only are these relationships statistically significant, but also their ability to explain the variance in ER and IE is robust. This helps to emphasize the core nature of KPIs in operationalizing AI in HR functions, and their two-fold effect on human and process-related results.

Similarly, Predictive AI Analysis (PAI) demonstrates significant direct effects on ER ($\beta = 0.267$, $t = 2.999$, $p = 0.003$) and IE ($\beta = 0.216$, $t = 2.724$, $p = 0.006$), as well as a strong impact on HR Effectiveness ($\beta = 0.621$, $t = 5.893$, $p < 0.001$). The results suggest that predictive analytics can not only make employees more willing to interact with AI-powered processes but can also increase the effectiveness of HR implementation strategies. Above all, the fact that PAI has a substantial direct impact on HR Effectiveness indicates its strategic importance as a tool to support evidence-based HR decision-making, workforce planning, and overall HR performance outcomes. This shows that predictive analytics is a powerful facilitator of attaining an organizational HR goal using data to make informed decisions.

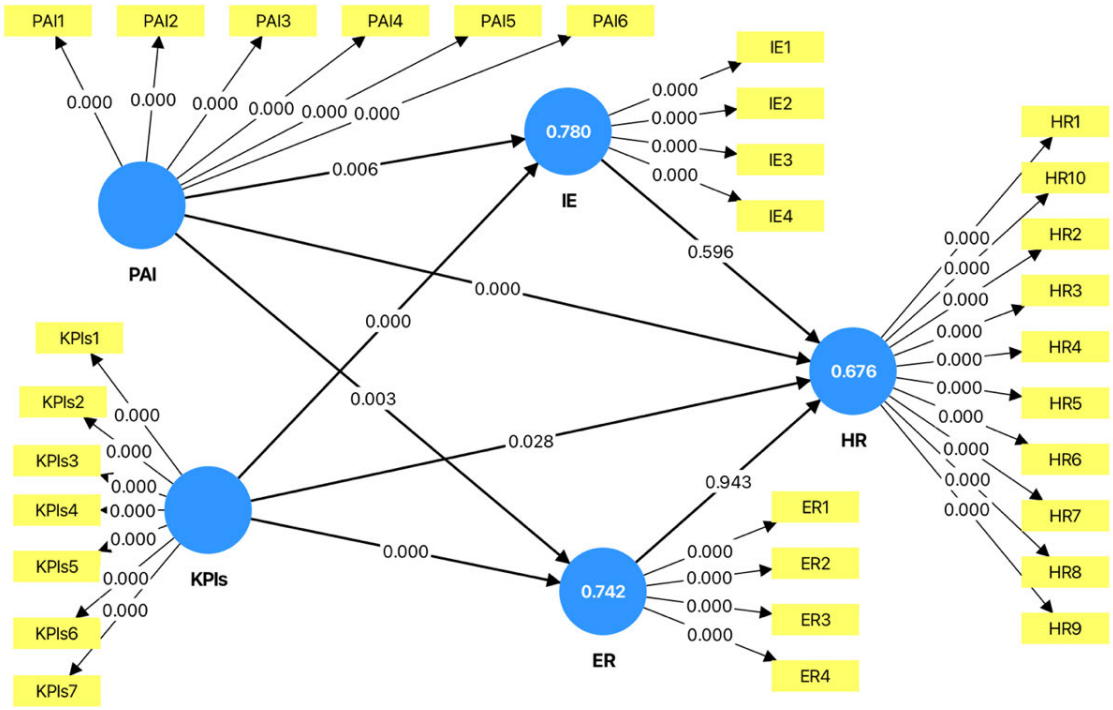
In contrast, the direct paths from Employee Readiness (ER → HR, $\beta = 0.008$, $t = 0.072$, $p = 0.943$) and Implementation Efficiency (IE → HR, $\beta = -0.059$, $t = 0.530$, $p = 0.596$) to HR Effectiveness were not statistically significant. These findings imply that although both ER and IE can be theoretically applied to HR outcomes, this effect can be significantly mediated by AI-based tools (i.e., KPIs and PAI). That is to say that employee readiness and process efficiency, in and of themselves, might not significantly improve HR performance unless combined with AI-based systems and analytics. This emphasizes the mediating position of AI-driven constructs in the transfer of operational readiness and efficiency to quantifiable HR outcomes.

Additionally, KPIs also show a significant positive effect on HR Effectiveness ($\beta = 0.277$, $t = 2.197$, $p = 0.028$), though the magnitude of this effect is smaller compared to PAI. This means that although KPIs are a direct contributor to HR performance improvement, their effect is augmented and enhanced when integrated with predictive analytics, highlighting the synergistic nature of AI tools on HR practices.

The direct path analysis shows that AI-enabled tools, specifically KPIs and PAI, are core drivers of operational readiness and HR effectiveness. These non-significant direct links between ER and IE indicate that their effect is largely indirect, which proves the need to implement AI systems to unlock the full potential of HR processes. These results give solid empirical evidence to the proposed relationships in the model

and reflect on the strategic and practical implications of incorporating AI-based indicators and predictive analytics in improving HR performance.

Figure (5- 8): PLS-SEM bootstrapping direct, indirect and mediation relationship



Sources: developed by the authors

Table (5- 15): Indirect (Mediating) Effects of Employee Readiness and Implementation Efficiency on HR Effectiveness

Indirect Effect	Path Coefficient	Standard deviation (STDEV)	T statistics	P values	Hypothesis Status
KPIs -> IE -> HR	-0.041	0.078	0.525	0.600	Not Supported
PAI -> IE -> HR	-0.013	0.027	0.478	0.633	Not Supported
KPIs -> ER -> HR	0.005	0.067	0.071	0.944	Not Supported
PAI -> ER -> HR	0.002	0.030	0.068	0.946	Not Supported

Sources: developed by the authors

Table (5-16) presents the results of the indirect (mediating) effects of Employee Readiness (ER) and Implementation Efficiency (IE) on HR Effectiveness (HR), focusing on how these constructs mediate the relationships between AI-related predictors—AI-measured KPIs (KPIs) and Predictive AI Analysis (PAI)—and HR performance outcomes. The path coefficients, standard deviations, t and p-values are provided in the table to give a clear statistical picture of the strength and significance of these indirect effects.

The findings reveal that none of the hypothesized mediation effects are statistically significant. Specifically, the indirect effect of KPIs on HR through Implementation Efficiency (KPIs → IE → HR) is negative but very small (β = -0.041, t = 0.525, p = 0.600), indicating that IE does not serve as a meaningful mediator in this relationship. Similarly, the indirect effect of PAI on HR through IE (PAI → IE → HR) is also negligible (β = -0.013, t = 0.478, p = 0.633). These results suggest that while IE may be conceptually relevant as a facilitator of AI-driven HR processes, its influence does not significantly transmit the effects of AI-related tools to HR Effectiveness in the current model.

Moreover, the indirect effects through Employee Readiness (ER) were also minimal and statistically insignificant. The path from KPIs to HR via ER (KPIs → ER → HR) yielded a path coefficient of β = 0.005 with a t-value of 0.071 and a p-value of 0.944, while the path from PAI to HR via ER (PAI → ER → HR) showed an equally trivial coefficient of β = 0.002, t = 0.068, and p = 0.946. These extremely low values indicate that ER does not function as a mediator between the AI-related predictors and HR Effectiveness, and the influence of these predictors on HR outcomes is primarily direct rather than indirectly transmitted through employee preparedness.

These findings indicate that Employee Readiness and Implementation Efficiency are not important mediators between AI-based tools and HR performance outcomes in the meaning of this study. This means that the KPIs and Predictive AI Analysis measured by AI effectively improve HR Effectiveness, at least in part, without the intervention of the proposed mediating mechanisms. Therefore, the organizational strategies that seek to enhance HR performance by using AI must target the direct

utilization of these AI tools, as opposed to anticipating significant indirect returns, such as employee preparedness or implementation effectiveness.

These results have valuable theoretical and practical consequences. Theoretically, the non-significant mediation contradicts previous research that has focused on the importance of employee preparedness and efficiency of the processes to support the adoption of AI. In practice, it highlights that prioritizing the direct incorporation and use of AI-enabled tools should be the focus of HR managers and decision-makers instead of preparatory provisions or optimizing the process to realize HR performance benefits. The findings support the preeminence of KPIs and Predictive AI Analysis as key contributors to HR Effectiveness in organizations.

5.10 Summary

The empirical findings of the suggested research model were examined and provided in this chapter. A SPSS and smart PLS hybrid was used to test the hypothesized correlations between constructs of the study: Predictive AI Analysis (PAI), AI-measured KPIs, Employee Readiness (ER), Implementation Efficiency (IE), and HR Effectiveness (HR). The descriptive statistics showed that the participants, in general, had high levels of perception of the significance of AI-enabled HR practices, specifically with the direct effect of AI-measured KPIs and Predictive AI Analysis on employee readiness and implementation efficacy, and the general improvement of HR effectiveness.

The results of the measurement model supported that all constructs have satisfactory reliability, convergent validity, and discriminant validity, which guarantees the strength of the following structural model analysis. The findings of the structural model demonstrated that KPIs measured by AI and Predictive AI Analysis significantly impact the readiness of employees and efficiency of implementation, which represents their essential importance as facilitators of AI-enabled HR practices. Contrary to this, employee readiness and implementation efficiency did not have direct statistically significant impacts on HR effectiveness in the present model, which indicates that the

effects of the model constructs on HR outcomes might be mainly indirect or contextually dependent.

The mediation analysis also helped to define how AI applications influence HR effectiveness. The findings revealed that employee readiness, as well as implementation efficiency, did not play any significant mediating role between the impact of AI-measured KPIs or Predictive AI Analysis on HR effectiveness. These results indicate that the immediate impact of AI-based tools is significant than any indirect impact on HR performance via employee preparedness or efficiency of the process, making AI application, per se, central to improving HR performance.

Predictive relevance and model fit assessments further supported the robustness of the proposed structural model. High R^2 values for employee readiness (0.742), HR effectiveness (0.676), and implementation efficiency (0.780), alongside substantial Q^2predict values, demonstrated the model's strong explanatory power and predictive accuracy. Error metrics (RMSE and MAE) were within acceptable ranges, confirming the stability and reliability of the model's predictions.

This chapter empirically demonstrates that AI-quantified KPIs and Predictive AI Analysis are enablers of HR effectiveness, both directly and via indirect mechanisms. The results support the practical significance of the usage of AI in HR practices and give a base to the following chapter, which will reveal the findings, referring to the literature, to external contributions of theories and practices, and to define the further research directions.

Chapter Six: Research Discussion

6.1 Introduction

The empirical data of the study were fully analysed in the previous chapter, using SPSS and SmartPLS to test hypothesised relationships between Predictive AI Analysis (PAI), AI-measured KPIs, Employee Readiness (ER), Implementation Efficiency (IE), and HR Effectiveness (HR). The findings gave a clear insight into the direct and indirect impacts of AI-enabled HR practices and their mediators.

Continuing his findings, the current chapter critically addresses the major findings of the study considering the existing theoretical framework and previous studies. The emphasis is specifically on the six hypothesized research propositions, which informed the exploration of how AI applications mediated by employee preparedness and implementation efficiency affect HR effectiveness. This chapter aims to provide an interpretation of the findings in the context of global and regional HRM practices and provide an understanding of the practical and theoretical implications of the study by contextualizing the findings.

The following sections will look at each of the hypotheses systematically, looking at both the supported and non-supported relationships, giving the reasons as to why this might be so. It attempts to bring more insight into the mechanisms by which AI tools promote HR effectiveness by methodically unpacking the direct and indirect links seen in the structural model. That way, the chapter is both empirical and theoretical and provides a critical reflection on the ramifications of AI adoption in HRM.

6.2 Summary of Hypotheses Findings

The results of this paper display a distinct trend of determining how AI-based HR practices affect HR performance, where direct effects occur and where organisational and staff-related factors mediate the influence. As shown in Tables 6-1 and 6-2, Hypotheses 1 and 2 were strongly supported, indicating that the direct

implementation of Predictive AI Analysis (PAI) and the application of AI-measured Key Performance Indicators (KPIs) have significant positive effects on HR effectiveness. The high path coefficient of 0.621 of PAI indicates its transformative power in strategic HR processes, facilitating the proactive and accurate planning of the workforce, precise evaluation of performance, and information-based decision-making. In the same vein, AI-derived KPIs, which have a path coefficient of 0.277, highlight the importance of AI in standardising performance measurement, enhancing transparency, and increasing accountability in HR practices. These findings are strong indicators that AI technologies are not just support tools but key drivers of HR performance in modern organisational environments, especially in the UAE and GCC region in general.

In contrast, the mediated hypotheses (H3–H6) showed no support and indicated that Implementation Efficiency (IE) and Employee Readiness (ER) do not play a significant role in the relationship between AI adoption and HR effectiveness. There were no significant indirect impacts of PAI and KPIs measured by AI using IE, which indicates that the effective implementation of AI is not strongly related to optimised implementation processes. This result contradicts the classic technology adoption models, which frequently stress the importance of cautious adoption and process streamlining to realise the technological gains. One possible answer is that current AI systems are intended to be modular, easy-to-use, and easy to include in the current HR processes, enabling organisations to achieve an instant HR performance increase without requiring a comprehensive plan on how to implement their solution. Likewise, the mediating effect of ER is not significant, which suggests that the readiness or involvement of employees is not a major factor affecting the short-term efficiency of AI tools. The utilisation of AI systems by managers in hierarchical organisational forms common to the UAE and the GCC seems to have a more decisive effect than the overall readiness of the employees.

The trend of confirmed and rejected hypotheses provides valuable suggestions on how AI technologies contribute to increasing the effectiveness of HR. The direct application of AI tools can deliver quantifiable gains, whereas the classical mediating variables, like the efficiency of the implementation and readiness of the employees,

might be less significant during the first steps of the technology implementation. This explains why it is necessary to pay attention to the strategic choice and incorporation of AI systems, as opposed to an excessive emphasis on the traditional mediating mechanisms. The results also highlight the cultural, managerial, and institutional peculiarities of the UAE and the GCC, in which HR technologies are adopted and used most effectively due to their cultural, managerial, and institutional specificities. Overall, the article provides a good baseline of how AI-based practices can reshape HR performance and provide both theoretical and practical support on how organisations can look to utilise AI in their human resource practices.

Table (6- 1): Summary of Direct Hypotheses Testing Results

	The research hypotheses	Direct	Path Coefficient	T values	P values	Hypothesis Status
H 1	Implementation of Predictive AI Analysis in HR positively impacts HR effectiveness	**PAI -> HR**	0.621	5.893	0	Supported
H 2	Application of AI-measured KPIs in HR processes positively impacts HR effectiveness	**KPIs -> HR**	0.277	2.197	0.028	Supported

Sources: developed by the authors

Table (6- 2): Summary of Indirect (Mediating) Hypotheses Testing Results

	The research hypotheses	Indirect	Path Coefficient	T values	P values	Hypothesis Status
H3	Implementation efficiency mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness	**PAI -> IE -> HR**	-0.013	0.478	0.633	Not Supported
H4	Implementation efficiency mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness	**KPIs -> IE -> HR**	-0.041	0.525	0.6	Not Supported
H5	Employee readiness mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness	**PAI -> ER -> HR**	0.002	0.068	0.946	Not Supported
H6	Employee readiness mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness	**KPIs -> ER -> HR**	0.005	0.071	0.944	Not Supported

Sources: developed by the authors

6.2.1 Hypothesis One (H1):

Implementation of Predictive AI Analysis in HR positively impacts HR effectiveness (Supported)

The first hypothesis was strongly supported, showing a significant positive relationship between Predictive AI Analysis (PAI) and HR effectiveness (Path

Coefficient = 0.621, t = 5.893, $p < 0.001$). This finding highlights the transformational potential of predictive analytics in altering the functions of human resources management by shifting them beyond the reactive and operational aspects of human resource management to strategic and evidence-based decision-making roles. Predictive AI will provide HR professionals with the capability to go beyond mere recording and reporting of past trends to predict future workforce behaviours and organisational needs. For instance, forecasting models can detect high-risk employees, anticipate attrition trends, forecast skill gaps, and identify high-potential talent, which are vital in planning the workforce and long-term strategic alignment (Agarwal, 2023). The strong statistical evidence of this hypothesis is that predictive AI gives HR a larger set of tools that makes it more efficient and more accurate, so that it is more useful and closer to organisational performance and competitiveness.

In addition to workforce planning, the introduction of predictive AI tools would dramatically enhance the quality of performance management and evaluation systems. The subjectivity of traditional appraisal techniques and their inability to reflect trends in the long run have been criticized. However, predictive analytics uses large volumes of data to identify performance drivers, behavioral predictors, and productivity trends previously undiscovered (Huang et al., 2023). With these kinds of insights, HR departments can create more effective, transparent, and prospective appraisal systems that reward potential contribution along with actual contribution. This not only increases employee confidence in organisational processes but also helps organisations to retain and nurture the best talent. The effect size achieved in this study is substantial, which supports the results of earlier studies on the subject (Van Rooyen et al., 2021; Davenport et al., 2020), demonstrating the capacity of predictive analytics to minimize uncertainty, guide strategic human resource activity, and deliver actionable intelligence to leaders that enhances decision-making accuracy.

Importantly, this outcome has even more weight in the Middle Eastern organisational context. A significant number of organisations within the region still juggle between highly ingrained traditional management styles, mostly intuitive and hierarchical, and newer technology-based styles. The key intermediary between these paradigm shifts is predictive AI. Predictive analytics enables decision-makers to make

culturally sensitive decisions grounded in objective evidence, aiming to meet international best practices (Yadav et al., 2025). Predictive AI is especially applicable to organisations located in the Gulf region, where rapid digitalisation is currently taking place but needs to be integrated with local practices and institutional norms. The research findings of this paper indicate that there is no need to have an organisational restructure that is disruptive or potentially face a lot of opposition on the part of the employees, since the benefits of predictive analytics are felt in the short run and are tangible. This contradicts previous assumptions that predictive AI adoption is time-consuming or that it will transform an entire culture (Kulshrestha, 2024).

The results of Hypothesis One show categorically that predictive AI analysis, when incorporated into an HR system, generates direct and quantifiable benefits to HR. It improves planning of the workforce, performance evaluation, and decision-making. This does not just make predictive AI a technological improvement but also a strategic need of organisations in the Middle East and beyond. It is one of the great levers that HR can use to move towards being seen as an enabling administrative role rather than an essential driver of organisational performance and competitive advantage. By demonstrating such strong effects, this study provides clear evidence that investment in predictive analytics is justified and essential for organisations seeking to thrive in increasingly data-driven and competitive environments.

6.2.2 Hypothesis Two (H2):

Application of AI-measured KPIs in HR processes positively impacts HR effectiveness (Supported)

The second hypothesis was also supported, with results showing a significant positive relationship between AI-measured KPIs and HR effectiveness (Path Coefficient = 0.277, t = 2.197, p = 0.028). The effect size was less impressive than the greater impact of predictive analytics, but this finding is still of high significance since it pointed to the key role played by AI-enforced KPI systems in integrating accountability, transparency, and consistency into HR operations. The automation of measuring and tracking key performance indicators ensures that there is a low chance

of human error and bias in determining whether someone should be promoted, appraised, or requires training or should be punished, as decisions are made using objective, real-time data as opposed to subjective data (Suvarna, 2025). By so doing, AI-calculated KPIs generate a fairer and more reliable performance evaluation system, one that helps make evidence-based decisions and promotes a culture of meritocracy in organisations.

This finding is consistent with previous research, like Huang and Rust (2021), which notes that AI tools have the potential to transform HR by improving accuracy, efficiency, and fairness in the performance measurement process. As opposed to traditional KPI frameworks, which typically use periodic and manually gathered data that can be inconsistent, AI-powered KPI measurement allows continuous tracking, providing organizations with an ever-changing perspective of performance trends among individuals, teams, and departments (Wuisan et al., 2023). This real-time feature enables HR to step in before the situation gets out of control, be it by correcting an underperforming employee, by providing rewards to high performers promptly, or by moving resources to where they are most required. In this way, the path coefficient of AI-measured KPIs is smaller than predictive AI analysis, but a KPI enables and supports a broader strategic HR practice by aiding the creation of a standardised base on which other strategic HR practices can be constructed.

This finding is especially timely when considering the context in the UAE and GCC region in general, where organisations are currently undertaking digital transformation efforts to harmonies local practices with international ones. In this area, the preference for performance management systems is to change the predominantly traditional and paper-based systems to an integrated and data-based system. KPIs measured by AI in those contexts may become essential in enhancing organisational transparency and minimizing perceptions of favoritism or unfairness that may sometimes accompany performance appraisal systems (Shah et al., 2025). Using objective measures to determine promotions, rewards, and career advancement opportunities allows organisations to show fairness in these areas, which are crucial in multicultural workforces, as fairness and transparency are important in talent retention. In addition, KPIs measured by AI will give managers empirical data to support

decisions, which not only reinforces the credibility of HR but also improves the confidence of employees and management.

At the same time, the comparatively small coefficient indicates that AI-measured KPIs ought to be regarded more as the supporting infrastructure rather than the driver of strategic change. KPIs do not necessarily drive innovation or large-scale behavioural change, but they do standardize performance assessment, establish benchmarks of accountability, and keep the organisation on track. Their true worth is their ability to develop an effective measurement mechanism that can be integrated with other AI applications, like predictive analytics, and guarantee that the corresponding insights are made based on valid and objective data (Arora et al., 2024). To organisations in the Middle East, this implies that AI-measured KPIs are invaluable resources in enhancing HR efficacy, although their contribution is more supportive than transformative.

The results of Hypothesis Two indicate that the AI-measured KPIs play a critical role in improving HR effectiveness through fairness, objectivity, and real-time tracking of performance results. Their influence is not as significant as predictive analytics, but they still offer the infrastructure upon which effective performance management and strategic HR decisions can be made. This renders them especially useful within the GCC setting where digitalisation, accountability, and transparency are emerging as the key to organisational success. With the integration of AI-based KPI systems, organisations can form a culture of self-assessment and evidence-based management, which is the first step toward sustainable HR performance improvements.

6.2.3 Hypothesis Three (H3):

Implementation efficiency mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness (Not Supported)

The third hypothesis was not supported, as the results demonstrated that Implementation Efficiency (IE) did not significantly mediate the relationship between Predictive AI Analysis and HR effectiveness (Path Coefficient = -0.013, t = 0.478, p = 0.633). It means that the effectiveness of the implementation process does not

significantly affect the positive contribution of predictive AI tools to HR outcomes. This is to say, predictive analytics have a compelling direct impact on HR performance, and do not require highly organised or optimised implementation frameworks. It is an important discovery as it contradicts much of the technology adoption and innovation management literature, which frequently emphasizes the need to plan things out, implement them in stages, and be efficient in deploying new systems to ensure their success (Venkatesh et al., 2012). The fact that implementation efficiency does not play a major role in this context as a mediator indicates that the specific design of predictive AI tools enables them to create tangible benefits, no matter how efficiently or smoothly the implementation process proceeds.

One way this outcome could be explained is through the growing maturity and availability of predictive AI technologies. Contrary to the previous generations of enterprise technologies that typically demanded significant integration effort, lengthy training, and technical skill, most current AI systems are modular, user-friendly, and generally can be easily connected with existing HR information systems. This design philosophy implies that, even in cases where efficiency of implementation is not optimal, e.g., because of a lack of resources, time constraints, or absence of detailed planning, organisations can still gain significant value out of the insights these predictive tools produce (Zhang, 2024). In the context of HR departments, it means that predictive analytics are resilient enough to work within imperfect environments, providing value promptly through the identification of patterns, workforce trends, and evidence-based decision-making. This strength can be one reason that the mediation role of implementation efficiency did not play a significant role in the study findings.

However, the absence of support in Hypothesis Three cannot be taken as evidence that the efficiency of implementation is irrelevant. Although the HR performance in the short term might not rely on the effective implementation, the long-term sustainability and scalability of AI tools might still rely on the systematic processing. Such a shoddily implemented implementation may not have any immediate negative impact on the utility of predictive analytics at the time, though it may cause problems over time, either through integration problems with the system, resistance on the part of employees, or inconsistent use by different departments. Under these

circumstances, predictive AI systems might not be effective in the long term, even after the preliminary results are promising (Gupta, 2024). Therefore, the results indicate a significant difference: predictive analytics can provide timely results irrespective of the efficiency of implementation; however, to allow organisations to continue to obtain a continuous and strategic value, effective implementation mechanisms are still required.

Both practice and theory also present interesting questions posed by the result. In theoretical terms, it implies that the mediating role of implementation efficiency, which has long been a focus of information systems literature, might be changing in the era of artificial intelligence. With the rise of artificial intelligence becoming more autonomous and more user-friendly, it can lead to less dependence on large implementation structures, thus altering the dynamics of adoption models (Madanchian et al., 2023). Practically, especially in the UAE and GCC, where quick digitalisation is repeatedly emphasized at the expense of slower and more progressive rollouts, this result may be positive. It also implies that organisations can still enjoy the benefits of predictive AI analytics, even when they are constrained in organisational resources or when they need to adopt them within a limited amount of time. Managers, however, must take care not to disregard implementation efficiency in general, because its role can become even more vital when the organisation wishes to roll out an AI application more widely or more deeply integrate it into HR strategy (Mahade et al., 2025).

The results of Hypothesis Three indicate that the Implementation Efficiency does not significantly mediate the relationship between the Predictive AI Analysis and the HR effectiveness. Predictive analytics seems to provide value itself without the need to have highly efficient implementation processes. This is a result of both the strength and flexibility of contemporary AI tools; however, it also indicates the need to pay attention to long-term sustainability. Even with less than perfect implementation, organisations can immediately reap the benefits of predictive analytics, but without a systematic process to reinforce the integration, training, and governance of the implementation, it may turn out to be a challenge to maintain. In this regard, the absence of mediation highlights the double reality of predictive AI adoption: in the short term, its applications are indisputable, but its success in the long term remains conditional on the discipline of implementation practices.

6.2.4 Hypothesis Four (H4):

Implementation efficiency mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness (Not Supported)

The fourth hypothesis was not supported, as the results indicated that Implementation Efficiency (IE) did not significantly mediate the relationship between AI-measured KPIs and HR effectiveness (Path Coefficient = -0.041, t = 0.525, p = 0.600). This result indicates that the favorable role of AI-measured KPIs on HR effectiveness is independent of the extent to which the implementation process is efficient. That is, it seems that the power of AI-based KPI systems to reinforce HR results is rather unrelated to organised or optimised rollout procedures. This observation is interesting since it contrasts with the wider body of research on technology adoption that tends to highlight the fact that the quality of implementation is a key factor in how effectively new systems impact organisational performance (Venkatesh et al., 2012). Rather, the current outcome reflects the uniqueness of KPI-oriented AI applications that can be less sensitive to implementation issues because of their simplified and standardised features.

A likely reason why this is so the fact that AI-measured KPI systems are naturally simple and pragmatic. In contrast to predictive analytics applications, which can imply complex algorithms, big data, and strategic-level analysis, KPI measurement systems are mostly aimed at automating the process of employee performance monitoring and correlating outcomes with set benchmarks. These systems can be installed into an existing HR activity with minimal interference and are therefore not dependent on the sophisticated implementation modules. Therefore, although the efficiency of implementation is not always optimal (because of the lack of time and sufficient resources, or a lack of training), AI-measured KPIs can still deliver immediate benefits by generating accurate, consistent, and real-time performance data. This is in line with the points made by Dwivedi et al. (2021), who argue that some types of AI applications, specifically automating mundane tasks, have low rollout barriers and can yield organisational returns despite rollout circumstances.

Practically, this result is of importance to organisations, especially in areas like the UAE and greater GCC, where there is frequently a drive to swiftly digitalise HR practices as components of more extensive country goals of technological progress. The findings suggest that AI-measured KPIs can be beneficial to the HR department even when resource availability to plan extensive implementation is low. Small-to-medium enterprises (SMEs) or government organizations may also find KPI automation tools beneficial without having to implement large-scale change management programmes (Al-Shammari et al., 2024). Promoting impartial performance appraisals and enhancing accountability, AI-based KPI systems can provide the benefits virtually overnight after their implementation, irrespective of how effective the underlying implementation process is. This supports the practical value of KPI tools as available and flexible technologies that can assist HR performance across a broad spectrum of organisational situations (Eubanks, 2025).

However, unlike Hypothesis Three, the absence of mediation should not be construed to mean the insignificance of implementation efficiency in general. Though short-term HR effectiveness gains might not demand efficient operationalisation, the sustainability of gains in the long term is directly linked to well-structured processes, correct training, and organisational preparedness. As an example, the validity and utility of KPI results can significantly decrease with the passage of time unless there are clear instructions on how to interpret the data, regular employee training, and continual system maintenance (Alwali & Alwali, 2025). Implementation efficiency in this sense might not be a critical constraint to early adoption but can be of growing significance as organisations aim to increase the breadth of AI adoption, connect KPI systems to prediction tools, or incorporate performance management as an integral part of strategic HR practices.

Findings associated with Hypothesis Four indicate that Implementation Efficiency is not a significant mediator between AI-measured KPIs and HR effectiveness. This result highlights the intrinsic power of KPI automation tools, which is to provide precise and objective performance data independent of the quality of its implementation and management. On the one hand, such independence emphasizes the short-term usefulness and access of such systems, but on the other hand, it also

indicates that in the long term, it is essential to implement them in a structured manner to provide consistency, employee engagement, and integration with long-term HR strategies. In this way, both the strength of AI-measured KPIs as short-term facilitators of HR effectiveness and the significance of a disciplined implementation to support its continued value over time are captured in the findings.

6.2.5 Hypothesis Five (H5):

Employee readiness mediates the relationship between the implementation of Predictive AI Analysis in HR and HR effectiveness (Not Supported)

Hypothesis Five was not supported, as the findings revealed that Employee Readiness (ER) did not significantly mediate the relationship between Predictive AI Analysis (PAI) and HR effectiveness (Path Coefficient = 0.002, t = 0.068, p = 0.946). This finding is especially notable considering that much of the current body of research on the nature and extent of technology adoption has been focused on the effects of employee preparedness and acceptance on the success of digital projects. Change models like the Technology Acceptance Model (Davis, 1989) and the change management model developed by Kotter (1996) have continued to emphasise that employee attitudes, skills, and willingness to change are significant mediators between the adoption of new technology and organisational performance. Nevertheless, the fact that this hypothesis has not received much support indicates that employee preparedness might not be as central in such a setting as predictive AI tools. This observation suggests that predictive analytics, by definition, may generate physical HR efficacy impacts despite a wide range of staff transformation and participation.

One potential reason why this is the case is the essence of predictive AI systems. Unlike technologies that demand substantial employee engagement, behaviour change, or extensive re-training, predictive AI applications typically act as decision support systems targeting HR leaders and managers. These systems are based on data integration and algorithmic processing to generate forecasts and insights, which are subsequently leveraged by HR professionals to make strategic decisions in workforce planning, talent management, and attrition prediction (Basnet, 2024). These tools do

not require employees to be actively involved in the use or process of adapting to them to be effective. In this way, the willingness of the employees (either attitude to AI or capabilities or the desire to adopt AI) becomes less pertinent to the current organisational performance. This technical feature of predictive AI could be the reason why the mediating effect of employee preparedness was negligible in this study.

The contextual and cultural aspects also yield some interesting information about this finding. In places like the UAE and the GCC in general, the organisational decision-making process tends to be hierarchical, or authority seems to be centralised at the management or executive level. In these settings, the impact of employees on the outcomes of technology adoption may not be as strong as that of flatter organisational designs that prevail in Western contexts (Alzeiby et al., 2025). As the main purpose of predictive AI tools is to assist managers in making decisions, but not frontline employees, employee preparedness might not have a significant impact on HR performance. Rather, the determinant can be the readiness and the ability of HR leaders and executives to adopt these tools, involve them in strategic planning, and use the insights delivered. This may be the reason why the direct influence of Predictive AI Analysis on HR effectiveness was significant, and the mediating factor of employee readiness was minor.

However, not having a significant mediation effect does not imply that employee preparedness does not affect the long-term results. Although predictive AI tools can involve working in managerial situations at present, the history of AI in HR indicates that, in the future, employees might communicate directly with their AI-controlled systems more often. AI-based solutions are being applied to personalised training, career pathing, and performance feedback, where employee willingness and readiness to adopt technology will have a decisive role. Furthermore, in predictive analytics, the viability of favorable results relies on the trust of employees in the AI-based decisions (Ergashev, 2025). In case the staff members feel that the AI systems are obscure, discriminatory, or dangerous, the opposition is likely to be revealed in the long run, which will compromise the efficiency of such technologies. Thus, although employee preparedness might not play a mediating role in the correlation between predictive AI and HR efficacy at present, it will be an essential component in

determining future interaction, acceptance, and long-term implementation of AI in HR systems (Vadithe & Kesari, 2025).

Hypothesis Five was disproved; the relationship between Predictive AI Analysis and HR effectiveness is not mediated by employee readiness. This undermines conventional assumptions in the technology adoption literature, as predictive AI tools are designed uniquely and focused on management, which enables them to produce instant benefits without necessitating the involvement of many employees. Simultaneously, the results emphasise that cultural and organisational backgrounds should be taken into consideration because a hierarchical decision-making framework can diminish the impact of employee preparedness on the results of AI adoption. However, the aspect of employee readiness must not be dismissed outright, as its value will continue to rise as more AI-based HR functionalities will focus on the employees, where long-term engagement and acceptance will be required to achieve the full benefit.

6.2.6 Hypothesis Six (H6):

Employee readiness mediates the relationship between the application of AI-measured KPIs in HR processes and HR effectiveness (Not Supported)

The sixth hypothesis was not supported, as Employee Readiness (ER) did not significantly mediate the relationship between AI-measured KPIs and HR effectiveness (Path Coefficient = 0.005, t = 0.071, p = 0.944). This finding implies that the advantages of AI-assessed KPI systems are achieved to a significant degree regardless of whether employees are ready to work with them. In contrast to technologies that require employees to be actively involved or engaged in a behaviour change, AI-based KPI systems are generally run in the background, automating the process of monitoring and measuring performance. Managers and HR professionals derive their value through the data as they use it to make evidence-based decisions around promotions, incentives, training needs, and workforce optimisation. Therefore, the willingness of the employees has little to do with the ability of these tools to enhance HR results. The result is in line with previous studies (Raisch and Krakowski, 2021), which emphasize

that AI-based KPI systems are not meant to be interactive platforms among employees, but as a management tool. This contributes to the fact that employee readiness did not serve as a significant (or even effective) mediator in this relationship.

Further discussion of this result leads to the structural position of KPIs in organisational performance systems. In the traditional sense, performance measurement has always been a top-down tool in which employees are rated according to selected indicators stipulated by the management. By introducing AI into KPI measurement, it makes this process more objective, standardised, and data-driven, but the dynamic behind it is not much different. Employees will still be the ones to be evaluated, and managers and HR professionals will still be the decoders and consumers of the outcome (Gagandeep et al.,2025). As a result, the success of AI-measured KPIs does not depend on how willing employees are to adopt them but rather on the degree to which managers can make the best use of the insights. This structural reality may be the reason the mediating effect of employee readiness was statistically nonsignificant in the present study. Employees can have very little or no direct control over the KPI systems' operation or integration of the results into HR processes.

At the same time, this finding does not mean that employee preparedness is not a factor in the greater adoption of AI-measured KPI systems. Although readiness might not mediate the short-term association between KPI tools and HR effectiveness, how workers feel about the tools in terms of fairness, transparency, and trust is the key to the success of the tools in the long run. When employees feel that AI-based practices are opaque, prejudiced, or reproachful, resistance and mistrust can arise, and eventually, it will lead to a decline in organisational morale and the perceived legitimacy of HR practices (Vrontis et al., 2023). This is especially necessary when AI systems are not only employed to monitor but also to influence employee development, training, and career growth. When that happens, preparedness is not so much technical competence as cultural acceptance, trust, and conformity to organisational values. Therefore, even though it was not statistically relevant in the present study, employee preparedness might have a latent contribution to the development of employee engagement and the maintenance of the credibility of AI-driven HR systems (Matin, 2025).

In addition, the local and cultural background also provides clues about the irrelevance of this mediating role. Performance evaluation is a managerial prerogative in many Middle Eastern and GCC organisations, and the employee has little influence on KPI system formation or challenge. At these places, the willingness to work on the employees' part might not significantly influence the short-term HR results, as the organisational framework leaves the decision-making process in the hands of HR executives and managers (Behera et al., 2025). The value of AI-measured KPIs is, therefore, more directly achieved by using the data in managerial ways than by adapting or being ready for employees. As organisational cultures change and more focus is given to employee engagement, however, readiness can become an increasingly important determinant of performance technologies adoption.

Hypothesis Six was rejected, meaning that the readiness of employees does not mediate the interaction between AI-measured KPIs and HR effectiveness. The observation indicates that the managerial orientation of KPI systems is effective and does not need many employees involved. Although such an example proves that AI-measured KPI tools are useful in the short term, it also highlights the need to observe the employees regarding perceived fairness and transparency to maintain long-term trust in the HR process transformed by AI. Finally, organisations should also contemplate the trade-off between the technical effectiveness of KPI systems and the human aspect of employee acceptance, although the level of readiness may not be a decisive mediator of short-term results.

6.3 Discussion

The results of this research can play an important role in the developing conversation on AI-enabled Human Resource Management (AI-HRM) through confirming and challenging the current theoretical frameworks of technology-based HR performance.

6.3.1 Extending AI-HRM Frameworks: Direct Strategic Impact of Predictive AI

The high popularity of H1 proves the fact that predictive AI analysis has a great and direct influence on HR effectiveness. The discovery adds to the current AI-HRM models, which tend to view AI as an assisting analytical tier, but not a strategic driver (Davenport et al., 2020; Tambe et al., 2019). The size of the path coefficient (0.621) indicates that predictive AI is not only increasing the efficiency of the administration, but it is also, in effect, reinforcing the strategic capacity of HR.

The conventional HR effectiveness frameworks focus on alignment, flexibility, and value generation (Ulrich et al., 2013). The current results also enrich these models by proving that predictive AI is an enabling infrastructure that can be used to increase the accuracy of forecasts, the alignment of the workforce, and proactive decision-making. Unlike the previously mentioned literature that presents analytics as a supplementary tool, this research makes predictive AI a key factor of HR performance under the conditions of an environment that is digitalized and based on the public sector.

Notably, the findings contradict previous adoption theories in which the effect of technology is conditional when the preparation of technology is extensive throughout the organisation (Venkatesh et al., 2012). In this case, the performance-generating capacity of predictive AI is inherent, implying that the modern AI tools can be structurally more autonomous and empirically driven compared to the previous generations of enterprise technologies.

6.3.2 Refining Performance Measurement Theory: The Role of AI-Measured KPIs

The evidence of H2 proves that AI-measured KPIs have a strong positive effect on HR effectiveness, but with a lesser effect size (0.277). It is an important discovery that narrows performance measurement literature by making a distinction between

strategic intelligence tools (predictive analytics) and operational accountability tools (AI-based KPIs).

Contrary to predictive AI, which changes the logic of decisions, KPIs measured by AI enhance standardization, fairness, and consistency. This is partly consistent with Huang and Rust (2021), who suggest that AI improves accuracy and efficiency in the HR procedures. The smaller effect size obtained is, however, an indication that KPI automation is more of a structural reinforcement rather than a strategic change.

This difference is a contribution to the theory of AI-HRM since it helps to understand that not every AI implementation can create the same level of strategic value. There are technologies that are transformative (predictive AI) and ones that are stabilizing and infrastructural (AI-based KPIs). This form of differentiation has not been developed in the previous literature.

6.3.3 Challenging Mediation Assumptions: Rethinking Implementation Efficiency

The lack of support of H3 and H4 confronts classical assumptions in the field of innovation and information systems research, where the efficiency of implementation is normally regarded as one of the most critical mediating factors between technology adoption and performance (Madanchian et al., 2023).

Opposite to these frameworks, this research paper concludes that the effectiveness of AI is not mediated by implementation efficiency in relation to HR effectiveness. The implication here is the theoretical change: the modern AI tools can be modular, intuitive, and integrative enough to create value even when the implementation conditions are less than optimal.

The realization does not nullify implementation theory but narrows it down. It means that the implementation efficiency mediation role can change depending on technological maturity. The performance gains in high-autonomy AI settings can be less regarded by the sophistication of formal rollout and more by the capability inherent in the algorithm. In this way, this piece of research can be used in the literature

on AI-HRM by recommending that the classical models of implementation need to be redone in the age of intelligent systems.

6.3.4 Reconsidering Employee Readiness in AI-Driven HR

Another theoretically important finding is the lack of mediation effect of employee readiness (H5 and H6). The readiness of the employees remains one of the key success factors that are always placed by technology acceptance models (Davis, 1989) and organizational change models (Kotter, 1996). Nevertheless, the current evidence shows that AI-based HR solutions, especially predictive analytics and KPI automation, can create performance advantages without extensive involvement of employees.

This finding undermines the argument that performance gains that are enabled by AI have to be employee contingent. Rather, it favors a managerialist style of AI, in which value is created at the executive and HR level, as opposed to the interaction with employees.

The finding, however, is perfect but does not rule out readiness theory. It implies that preparedness can become more prominent in AI systems that have a direct interaction with employees (e.g., AI coaching tools, individualized learning systems). At the present managerial-based AI environment, though, the willingness of the employees seems to be structurally less compelling.

6.3.5 What is Novel About the UAE Public-Sector Context?

The UAE public sector has a distinctive institutional setting that is characterized by blistering digitalization, high-level congruence of government vision, and hierarchical decisions. Contrary to Western contexts, where flatter organizational structures enhance the power of the employees in terms of technological success, the UAE public-sector organizations tend to have centralized strategic authority.

It is this structural feature that might have led to employee preparedness not creating any significant mediating effects on AI outcomes. It is also concentrated in

decision-making at the managerial levels, allowing AI systems to affect performance by influencing performance through leadership-based utilization instead of grassroots implementation.

Moreover, the UAE national digital transformation agenda generates the institutional momentum that is expected to speed up the adoption of AI and, therefore, may decrease the reliance on the gradual implementation procedures. Such settings might have a technological influence that leads to adapting to the culture rather than depending on it.

Thereby, the originality of the current research is that it shows that:

1. Predictive AI is valuable in the direct improvement of HR in a hierarchical public-sector organization.
2. The efficiency of implementation in systems of governance that are digitally ambitious might not be determinant.
3. Employee preparedness might not have a reduced short-term influence in the centralized organizational design.
4. The frameworks of AI-HRM used in the Western context of the private sector fail to generalize to the Gulf context of a public institution..

6.4 Chapter summary

The overall discussion of the six research hypotheses gives a detailed insight into the potential of AI technologies to improve HR efficacy in the UAE environment. Throughout the hypotheses, one big picture can be observed: the direct introduction of AI tools, specifically of Predictive AI Analysis (PAI) and AI-measured KPIs, is associated with a considerable impact on HR effectiveness, but the mediating effects of Implementation Efficiency (IE) and Employee Readiness (ER) have not been substantiated in many cases. This dichotomy brings to the fore an essential understanding that AI-induced HR capabilities of the modern organisation can have a significant influence without depending on preexisting organisational efficiencies or the ability to adapt to change among its staff. The fact that H1 and H2 are supported strongly supports the potential transformative role of AI tools in decision-making,

performance evaluation, and strategic HR management, showing that they are not just supplementary tools but the key drivers of HR performance in the UAE and possibly the entire GCC.

The absence of H3 being supported by H6 is an interesting contrast that should be carefully interpreted. Although the literature tends to highlight the need to implement with structure and to prepare employees to successfully adopt technology (Venkatesh et al., 2012; Davis, 1989), the current study argues that some of the conventional limitations can be avoided with modern AI applications, predictive analytics, and automated KPI systems, in particular. The ease of use, the modular design, and the ability of these tools to generate actionable insights with minimal interference seem to reduce the reliance on strict implementation procedures or large-scale employee preparation. Applying this to the UAE, in which hierarchies are commonly found, and the control of managers is typically the determinant of success or failure in the operations, it is quite possible that managerial implementation and use of AI systems contribute to the effectiveness, rather than overall employee involvement or willingness. This is indicative of a distinctive organisational culture within the region where the top-down implementation may deliver instant outcomes without necessarily subjecting the entire working population to behavioural change.

Moreover, the differences in the magnitude of direct and mediated relationships also contribute to the understanding of the processes of AI integration in HR practices. Predictive AI Analysis had the greatest direct effect, indicating that strategic forecasting and predictive functionality have a direct positive impact on the HR decision-making process, workforce planning, and resource assignment. In the meantime, KPIs assessed using AI, despite their positive impact, served a facilitative purpose, supporting accountability, performance tracking, and organisational goal alignment. The low levels of mediation of IE and ER suggest that, though the two constructs might be conceptually relevant, their operational impact is not very significant at the pre-adoption stage of AI-driven HR technologies. These results undermine classic premises in technology adoption theory, that the concrete attributes and design of current AI tools can bypass classic obstacles to efficiency.

The results of this research tell a coherent story: AI technologies, strategically used in HR functions, have the potential to bring immediate and significant changes to organisational results, and their effectiveness is not highly dependent on classical mediating factors, including implementation efficiency or employee willingness. The observation proves especially pertinent to the UAE and the GCC setting, whereby organisations are starting to allocate resources towards digital transformation in their attempts to modernise HR functions, achieve strategic workforce goals, and improve competitiveness. Results also indicate a change in locus of control of AI-enabled HR effectiveness, with greater importance given to central managerial utilisation and system capabilities as opposed to broader employee adaptation. These lessons precondition the following discussion of the practical and theoretical implications, as the authors will focus on how organisations can strategically use AI applications to maximise HR performance without overlooking cultural, structural, and technological factors peculiar to the regional environment.

Chapter Seven: Conclusions

7.1 Introduction

This chapter summarises the main contributions made because of a thorough analysis of the relevance of AI technologies, i.e., Predictive AI Analysis (PAI) and AI-measured KPIs, to HR performance in UAE-based organisations as the research journey comes to its end. Based on the empirical research findings discussed in the earlier chapters, in this section, the key findings of the research will be summarized, with the aim of underscoring their theoretical, practical, and policy implications to AI-based HR practices. The research contributions become the highlight here, discussing the importance of incorporating modern AI resources in HR activities and taking into account the socio-cultural and organisational peculiarities of the UAE and the GCC as a whole. Concurrently, this chapter has recognised the limitations in the study, not as weaknesses as such but as guiding factors themselves that define the scope of the study and offer areas to explore in the future.

The essence of this research is to learn how AI applications, i.e., Predictive AI Analysis and AI-measured KPIs, produce a direct positive effect on HR effectiveness and how the mediation or mediating of the relationship is driven by Employee Readiness and Implementation Efficiency. This chapter explains how these findings can be relevant to HRM theory by explaining how AI tools have a direct and strong impact on HR performance, even in situations where the process of adaptation or implementation of employees may be less optimised. It also presents the practical implications for HR professionals and organisational leaders, offering an evidence-based understanding of how AI could be used to undertake organisational workforce planning, performance assessment, and strategic decision-making. Finally, this concluding chapter provides a reflective conclusion on the contributions of the study, the methodology used, and its limitations, and describes the potential avenues of future research in the field of adopting AI in HR in the unique cultural and institutional context of the UAE.

7.2 Overview of Main Findings

In this section, the main findings on the topic of AI application in HR and its impact on HR performance in UAE organisations are thoroughly synthesised based on the empirical analysis. The researchers tested 6 research hypotheses, namely the direct and indirect effects of Predictive AI Analysis (PAI) and AI-measured KPIs on the HR outcomes, whereby Employee Readiness (ER) and Implementation Efficiency (IE) were taken as potential mediators. The results demonstrate a complex terrain where AI technologies have a dominant role in influencing HR productivity, and the anticipated mediating processes work in opposite directions to the predetermined assumptions.

The direct impact of Predictive AI Analysis on HR effectiveness was largely confirmed in the first hypothesis. It means that predictive analytics can directly improve HR functions (such as workforce planning, performance management, and strategic decision-making) without the implementation processes or employee adaptation. The second hypothesis and the effect of AI-measured KPIs on HR effectiveness were also proven, but the effect was smaller. It shows that AI-based performance measurement helps to increase accountability, transparency, and real-time tracking of HR outcomes, which can be used to build evidence-based HR decisions.

On the other hand, the four hypotheses that investigated the mediating effects of Implementation Efficiency and Employee Readiness were not supported. The relationship between AI applications and HR effectiveness did not show any significant mediators of the relationship by either IE or ER. This is the reason why these findings indicate that the success of AI tools as applied to UAE organisations is largely dictated by their direct incorporation into HR systems and not the efficiency of rollout processes or the perceived preparedness of employees. This result could be a consequence of the intuitive, modular construction of contemporary AI systems, which enable organisations to obtain immediate value without having to restructure their organisations or alter the behaviours of their staff at large. Moreover, the mediating role of employee readiness can be reduced under the influence of cultural and organisational specifics of the UAE and GCC, where a hierarchical form of decision-

making and a manager-oriented HR process can play a crucial role, making the adoption of AI in HR a culturally specific phenomenon.

Key results highlight the transformational opportunities provided by AI technologies in HR, especially in increasing decision-making accuracy, efficiency, and strategic alignment. Though the conventional theories of technology adoption focus on the formal implementation process and the readiness of employees, this paper shows that high-level AI tools can produce the practical HR value even in situations when the latter are less evident. These findings contribute to theoretical and practical gaps in the existing body of literature on AI-based HR practices in developing markets and offer practical advice to organisations that might want to use AI to streamline their HR operations.

7.3 Contribution

The work is a significant contribution to both theoretical and practical aspects of the study, as it contributes to the enhancement of knowledge of how predictive AI analysis and AI-calculated KPIs affect HR effectiveness in the UAE public sector. Having empirically tested a structured mediation model in one of the government settings that are rapidly going digital, the research transcends the general discussions about the adoption of AI technologies and offers a more detailed view of the way in which AI tools create organizational value. This contribution is not only in validating the strategic usefulness of AI in HRM but also in questioning the prevailing assumptions about preparedness, ordering of implementation, and models of adoption, which are user-dependent.

7.3.1 Theoretical Implications

- **Reframing Technology Acceptance in AI-Driven Contexts**

The present study enhances the Technology Acceptance Model (TAM) (Davis, 1989) by illustrating that the high-order AI systems can produce organizational results in situations where the conventional mediating variables like the readiness of

employees do not prove significant statistically. TAM also generally assumes that the behavioral intention is affected by perceived usefulness and perceived ease of use, and performance consequences are instigated through the behavioral intention (Venkatesh and Bala, 2008). But the results of this paper indicate that in the case of AI-enabled HR settings, benefits to the organisation may become apparent without the widespread employee adjustment. Predictive AI tools seem to be able to generate strategic value by being used at the managerial level and not on behavioral change at the workforce level. It means that the introduction of AI could have a non-linear trend where the increase in performance could be followed by the complete acceptance of the device on a psychological or cultural level. The study, therefore, is beneficial to the study of TAM because it shows the importance of re-evaluating user-centric assumptions when discussing high-autonomy AI technologies.

- **Extending UTAUT in Hierarchical and Institutional Contexts**

The results also build on the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2012) by showing the cultural and institutional structures as affecting the avenues by which technology can influence the performance of organizations. UTAUT focuses on the determinants of use behavior on performance expectancy, effort expectancy, social influence, and facilitating conditions. The managerial approval and institutional power, however, seem to make a more decisive impact than peer pressure or perceptions of effort in the UAE public-sector setting. Technology adoption in hierarchical forms of governance systems is usually structuralized by top-down compulsions instead of negotiated by social networks. The current study thus serves to add to UTAUT in the sense that it demonstrates that in some cultural contexts, the mechanisms of leadership-based compliance and institutional legitimacy can replace bottom-up acceptance processes and thus increase the scope of the model in non-Western and government-driven digital transformation contexts.

- **Differentiating Transformative and Infrastructural AI in HRM**

The other valuable theoretical input is the capacity to differentiate transformative and infrastructural AI applications in the context of HRM. The findings indicate that predictive AI analysis has a high strategic impact on HR performance, and AI-based KPIs have a less significant, though stabilizing, impact. This distinction works in the development of AI-HRM theory since it acknowledges that not every AI technology has the same organizational impact. Predictive AI is a tactical ability that transforms the logic of decision, labor forecasting, and talent planning, but AI-quantified KPIs enhance accountability, objectivity, and standardization in performance frameworks. This explicit distinction takes the study beyond the generic arguments of AI adoption and offers a more detailed insight into the ways in which certain features of AI create various forms of value in HR systems.

- **Rethinking Mediation in Digital Transformation Models**

The insignificant mediation impacts of the implementation effectiveness and the employees' preparedness defy the traditional concepts of digital transformation that presuppose the successive and linear adoption patterns (Besson and Rowe, 2012). The traditional models propose the use of organizational readiness and organized implementation as intervening factors between technology adoption and performance results. Nevertheless, the results of the given study suggest that predictive AI and AI-measured KPIs may produce direct performance improvements without the need to make extensive use of these mediating mechanisms. This implies that superior AI systems might have inherent performance-generating capability because they are algorithmically mature and modular in construction. This study, therefore, adds to the digital transformation theory by suggesting that models of adoption of AI have to change to incorporate leapfrogging or direct-value models instead of following a series of adoption stages strictly.

7.3.2 Practical Implications

- **Strategic Deployment of Predictive AI in HR**

The results provide explicit recommendations to the HR leaders and policymakers. The high level of direct impact of predictive AI analysis suggests that organizations need to make an investment in predictive workforce analytics as a strategic asset and not an incidental technological enhancement. UAE-based organizations can incorporate predictive models into the workforce planning, succession management, and attrition forecasting systems so that they can anticipate the talent deficit and skill gaps even before they occur. As an illustration, predictive analytics could help ministries to define potential high-risk turnover groups and proactively develop proactive turnover retention or development policies. With such predictive dashboards integrated into the executive decision-making processes, HR departments can rebrand themselves as strategic partners, which have a direct impact on the level of organizational competitiveness and national workforce objectives.

- **Strengthening Accountability Through AI-Measured KPIs**

The fact that AI-measured KPIs have a mediate yet significant influence provides support for the importance of such measures in the ability to foster transparency and fairness in performance management systems. To put this finding into practice, organizations can automate the KPI tracking of each department and base promotions, incentives and development opportunities on AI-approved performance metrics. The identity of objective KPI systems can minimize bias perceptions and increase legitimacy in HR decisions in multicultural workplaces like those existing in the UAE public sector. Through the replacement of manual appraisal systems with real-time data-driven measurement systems, HR departments will be able to institutionalize merit-based evaluation systems that will enhance employee trust and organizational credibility.

- **Managerial Capability as a Priority Over Broad Readiness**

Since the readiness of employees was not a significant mediator between AI and performance relationships, the study implies that organizations should not wait until the entire workforce has been transformed before implementing AI. Rather, it is necessary to focus on improving the ability of managerial and HR leadership to interpret and ethically use the results of the AI. Specific AI literacy education at executive levels and formal training for HR analysts could provide more expedient performance advantages compared to massive organizational transformation programs. This does not mean that the importance of employee engagement should be underestimated, but, instead, the significance of leadership-focused competence should be utilized in terms of value creation at an earlier stage.

- **Balancing Immediate Gains with Long-Term Governance**

Even though efficiency of implementation did not play a key role in short-term outcomes, long-term sustainability still needs to have organized mechanisms of governance and supervision. The organizations are supposed to form AI governance committees, conduct periodical audits of the system, and adhere to the data protection laws in the UAE. Procedures of data management, transparency in the algorithms, and performing ethical review will contribute to preserving trust and avoiding reputational risks. These results confirm the dual strategy where organizations can achieve both short-term performance benefits and, at the same time, establish institutional protection to create a sustainable integration of AI.

- **Policy-Level Implications for UAE Public Institutions**

At the policy level, the research supports the integration of AI-enabled HR systems within broader national digital transformation agendas. Government institutions can confidently promote predictive analytics and AI-based performance systems as tools for improving accountability and workforce planning without requiring extensive structural reform prior to implementation. Predictive AI can also be leveraged to support long-term national workforce initiatives, including talent localisation and strategic skills development. By embedding AI within HR policy

frameworks, public institutions can enhance alignment between organisational performance and national economic diversification objectives.

7.3.3 Policy Implications

Policy-wise, the study offers recommendations to organisational leaders and government regulators in the UAE on the matter of embracing AI in HRM. Policymakers can think about creating systems and principles that can help utilize AI in HR practices ethically, fairly, and transparently, especially in cases where AI application is applied to performance measurement and workforce decisions. These frameworks can cover issues around bias, privacy, and data governance and make the use of AI fully consistent with overall organisational and national goals, such as the localisation of workforce strategies and digital transformation agendas. Moreover, due to the cultural and hierarchical peculiarities of the UAE organisations, the policies that offer managerial control and responsibility to AI-based HR programs might be more productive compared to the policies that target the preparedness of the workforce. Organisations and regulators can maximize the advantages of AI implementation and reduce the risk of negative outcomes by matching the policy action(s) with the positive and negative effects of AI usage as witnessed in this study.

Overall, the implications of this study offer a multi-faceted view on how AI tools can directly change HR performance by providing practical recommendations to scholars, managers, and policymakers who want to use technology as a strategic asset within the UAE and other emerging markets.

On the policy level, the results indicate that regulatory frameworks, which promote the use of AI in HR without compromising ethical and fair practices, can be beneficial to organisations in the UAE and the entire GCC region. Policymakers should develop regulations that govern the responsible use of AI technologies, particularly concerning data privacy, the presence of equity in the administering of performance evaluation, and transparency during the decision-making process. Furthermore, the usefulness of AI tools can be enhanced by digital literacy-related policies and HR and managerial training programs, to ensure that the technological adoption is accompanied

by appropriate capability building. Policymakers can speed up the digitalisation of HR practices by offering incentives to organisations to incorporate the use of predictive analytics and AI-informed KPIs, so that plans to manage the workforce are aligned with the economic development objectives.

7.4 Limitations of the Study

Although this study has come up with recommendations that are of utmost value, it is limited to some degree and provides very important factors to consider in this study and conduct future work. In a methodological sense, the research was mostly based on cross-sectional survey data of HR professionals and managers in UAE organisations. Although this method enabled conducting an effective evaluation of the connections between Predictive AI Analysis, AI-measured KPIs, employee preparedness, implementation effectiveness, and HR effectiveness, it automatically restricts the possibility of concluding on causality. Longitudinal research may offer a more detailed analysis of the effect of AI adoption on HR outcomes through dynamic shifts in employee perception, system use, and organisational performance. Furthermore, when using self-reported measures to measure variables, common method bias may occur, as the perception of the measures by respondents can be affected by personal experience, organisational culture, or social desirability. Even though we used statistical techniques to reduce the risk of such effects, some of the findings could be affected by residual bias.

In contextual terms, the research is limited by the scope of organisations based in the UAE, both in the private and public domains. Although this offers valuable information about the use of AI technologies in a distinct cultural, institutional, and economic context, it also limits the ability to generalize findings to other areas. The hierarchical organisational structure of the UAE, the culture of managerial decision making, and certain policy frameworks that surround workforce localisation and digital transformation might be rather unlikely to reflect the situation in the other countries of the Middle East or in the global markets. Likewise, cultural variables, including

managerial control and employee respect, can also affect the adoption and perception of AI technologies and, therefore, the extent to which observation can be generalized.

Another limitation is associated with the area of AI applications studied in the present paper. The research was based on two key constructs, like Predictive AI Analysis and AI-measured KPIs. These are essential and popular AI applications in HR management, but other recently emerging technologies, including talent analytics based on natural language processing, AI recruiting chatbots, and worker sentiment analysis, have not been mentioned. Perhaps this is because the scope of these tools may not be able to show the full extent of AI effects on HR performance, and research could explore these new options to provide a more comprehensive perspective.

Lastly, the size of the sample used in the study was adequate to allow a structural equation modelling technique, but could be a limitation in the statistical power to identify any latent effects, especially mediation pathways. The non-significant results of employee readiness and implementation efficiency as mediators should, therefore, be taken with a grain of salt. The possible results of such can be used to suggest context-specific processes, measurement error, or lack of variation in the data, rather than to demonstrate beyond a reasonable doubt that the results are universally applicable. Additional studies with more samples and diversity would help confirm/correct these findings and offer greater assurance with regard to the externalisability and generalisability of the results.

Overall, although this paper offers some valuable insights into how AI technologies can be applied to improve the effectiveness of HR in the UAE organisations, its methodological, contextual, and scope-related shortcomings are important areas where one should proceed with caution and research. The identification of these limitations serves to situate the study within its appropriate frame of reference, offering a foundation of academic literature that can be expanded to a higher level of comprehension of AI-based HRM practices.

7.5 Recommendations for Future Work

To the academic community, this research reveals some potential areas of research in the future. First, it is suggested to conduct longitudinal studies to explore the future impact of AI adoption on HR effectiveness and gain a more insightful understanding of the impact of predictive analytics and KPI measurement on organisational performance in the long term. Second, it can be helpful to broaden the list of applications of AI to cover other aspects of the field, including employee sentiment analysis, recruitment chatbots, and natural language processing systems, which would offer a more holistic view of the role of AI in HR. Third, it would be useful to conduct comparative studies in diverse cultural and organisational settings to ascertain whether the results identified in the UAE can be generalised to other Middle Eastern or other global environments. Finally, the research might be extended in the future to analyse in which situations employee preparedness and implementation effectiveness might be relevant and test it with mediating variables, such as organisational culture, organisational support of leadership, or technological progress.

To summarize, the following recommendations offer a blueprint of how AI technologies can be effectively used to improve HR effectiveness. Integrating effective HR manager techniques, policy intervention supports, and, importantly, specific research efforts, organisations have the opportunity to realise the potential of predictive analytics and AI-sensitive KPIs, leading to sustainable HR performance and organisational performance improvements. With this style of integration, AI implementation will not just yield instant operational payoffs but also contribute to long-term strategic HR management capabilities.

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Appendix

Appendix A (Questionnaire)

The Impact of Predictive AI Analysis and AI-Measured KPIs on UAE Public Sector Organisations: The Mediating Role of Implementation Efficiency and Employee Readiness

Dear Respondent,

I am a graduate student at the University of Gloucestershire. I am conducting a study regarding the Impact of Predictive AI Analysis And AI-Measured KPIs In UAE Public Sector Organisations. You will be asked to complete one survey instrument that will take approximately 8-10 minutes to complete. The survey consists of 36 questions. You will be asked to complete a demographic form. The form asks questions pertaining to age, gender, level of experience. Risks are minimal and the information obtained about you will be kept in confidence. No names will be used.

All surveys will be coded. Names will only be able to be traced by the researcher. The information may be used for statistical or scientific purposes without identifying you as an individual. The data collected will be stored on an encrypted file in the sole possession of the researcher. No person will have access to data other than the researcher. Participants identities will be kept anonymous, and all data will be secured in password protected files. Surveys will not be linked by IP addresses. Files will be permanently erased after 6 months or as soon as research project is completed.

Sincerely,

Survey Questionnaire

Part I – Personal Details

Q1. What is your gender?

a. Male
b. Female

Q2. Which age group do you belong to?

a. Less than 25 years
b. 25-35 years
c. 36-45 years
d. 46-55 years
e. More than 55 years

Q3. What is your educational qualification?

a. High School
b. Graduate
c. Diploma
d. Post-graduate
e. PhD
f. Others (please specify) _____

Q4. How long have you been working in your current organisation?

a. Less than 3 years
b. 3-5 years
c. 6-8 years
d. More than 8 years

Q5. What is your current role in HR?

a. Junior employee
b. Supervisor
c. Manager
d. Senior management
e. Leadership

f. Others (please specify) _____

Part II

Artificial Intelligence (AI) in Human Resources (HR)

Q6. AI is revolutionising HR processes in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q7. The role of AI is highly important in the HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q8. AI is highly effective in streamlining and automating HR activities in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q9. AI is highly effective in enhancing employee engagement through HR activities in your organisation.

1. Strongly disagree
2. Disagree

3. Neutral
4. Agree
5. Strongly agree

Q10. HR strategy management is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q11. Employee engagement is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q12. Performance management is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q13. Learning and development is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree

2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q14. Task automation is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q15. Employee retention is the most significant benefit of AI in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Predictive AI Analysis in HR

Q16. Predictive AI is highly effective in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q17. Employee data analysis is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q18. Talent acquisition is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q19. Forecasting employee performance is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q20. Strategic workforce planning is the most significant benefit of Predictive AI analysis in enhancing HR effectiveness in your organisation?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree

5. Strongly agree

Q21. There are significant challenges faced from the employees and HR teams in your organisation to undertake Predictive AI Analysis in HR.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

AI-measured Key Performance Indicators (KPIs) in HR

Q22. AI-measured KPIs are highly effective in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q23. Performance management is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q24. Real-time data analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.

1. Strongly disagree

2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q25. Employee satisfaction is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q26. Data-driven decision making is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q27. Unbiased employee analysis is the most significant benefit of AI-measured KPIs in enhancing HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q28. There are significant challenges faced from the employees and HR teams in your organisation to follow AI-measured KPIs in HR.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Implementation Efficiency

Q29. The role of implementation efficiency is highly important in AI for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q30. The role of implementation efficiency is highly important in Predictive AI Analysis for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q31. The role of implementation efficiency is highly important in AI-measured KPIs for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral

4. Agree
5. Strongly agree

Q32.The role of implementation efficiency is highly important for effective decision- making in HR.

Strongly disagree

1. Disagree
2. Neutral
3. Agree
4. Strongly agree

Employee Readiness

Q33. The role of employee readiness in AI is highly important for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q34. The role of employee readiness is highly important in Predictive AI Analysis for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q35. The role of employee readiness is highly important in AI-measured KPIs for HR effectiveness in your organisation.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Q36. The role of employee readiness in AI is highly important for effective decision- making in HR.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Thank you for filling the questionnaire.

I really appreciate your effort and the time you devoted to filling the questionnaire.

Your answers will help me in determining the outcome of my thesis.