Investigating the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa

by

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DECLARATION

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ABSTRACT

The study investigated the adoption, implementation, and impact of Artificial Intelligence (AI) in Human Resource Management (HRM) within a Durban, South Africa, manufacturing company. Following a qualitative research approach by conducting semi-structured interviews, the study, as per its research objectives, examines three areas: the current state of AI adoption, opportunities and challenges of implementation, and AI's impact on critical HRM functions. The study found that AI adoption in Durban's manufacturing industry is still in its early stages, with a significant technology deficit compared to global business. Three major areas of AI use was discovered: formalised recruitment and selection processes, administrative automation, and unofficial usage of generative AI tools by Human Resources (HR) professionals. The study found that adoption rates vary greatly depending on organisational size and resource availability, with large multinational corporations having higher implementation rates. Opportunities for AI applications include increased HR process efficiency, improved recruitment outcomes, and data-driven decision-making skills. However, challenges include concerns about accuracy and reliability, adherence to South Africa's Protection of Personal Information Act (POPIA), and cultural sensitivity. Ethical considerations were critical when implementing AI; Data protection, human oversight, and transparency in AI implementation are significant factors. The study revealed AI's considerable impact on four HRM functions: recruitment and selection, performance management, learning and development, and employee engagement. The shift from traditional monthly reviews to continuous, data-driven assessments marks a fundamental change in performance management approaches. The research emphasised the necessity of encouraging positive attitudes towards AI adoption through open communication, openness, and comprehensive training programs. The study contributes to understanding AI integration in HRM within South African manufacturing. It provides valuable insights for organisations planning to implement AI solutions while considering their unique contextual challenges and opportunities.

Keywords: Artificial Intelligence, Human Resource Management, Manufacturing, South Africa, Digital Transformation

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ABBREVIATIONS AND ACRONYMS

AI	-	Artificial Intelligence
HR	-	Human Resources
HRM	-	Human Resources Management
L and D	-	Learning and Development
ML	-	Machine Learning
NLP	-	Natural Learning Processes
POPIA	-	Protection of Personal Information Act
SA	-	South Africa

Chapter 1: Introduction and Background

1.1. Introduction

Artificial Intelligence (AI) technology has transformed various industries in the past few years, including human resource management (HRM). “The ongoing development of business and the most recent advances in artificial intelligence (AI) allow for business practices to be improved, creating competitive advantage.” (Bharadiya et al., 2023, p. 2). Research by Schoeman et al. (2021) highlights that AI can add up to a full percentage point to South Africa's annual economic growth rates by 2035. South Africa, recognised for its varied workforce and dynamic corporate environment, is increasingly adopting AI to improve business and Human Resources (HR) operations. This research investigated the impact of AI on HRM practices in South Africa.

AI deployment in HRM can open new possibilities (Sanyaolu and Atsaboghena, 2022). The use of AI in HRM has various potential benefits, including improving recruiting procedures, increasing employee engagement, and improving decision-making through data-driven insights. Despite the various benefits, companies may face challenges with AI implementation in HR. These challenges include concerns about data protection, the influence on job security, and the need to upskill current personnel to collaborate with AI systems effectively.

The study chapters will be as follows: Chapter 1 describes the study's aim of assessing the influence of artificial intelligence on human resource management in a Durban manufacturing company. Chapter 2 reviews the research on how AI and HRM interact in manufacturing in Durban, South Africa, reviewing AI integration into essential HRM functions and manufacturing applications, opportunities, challenges and ethical considerations. Chapter 3 describes the qualitative, phenomenological research methodology. Detailing semi-structured interviews with 12 HR professionals, using thematic analysis to answer the research questions. Chapter 4 presents the interview findings on the current state of AI in HRM. The study's findings on AI's disruptive potential and the significance of a well-rounded strategy that tackles obstacles to effective AI integration in HRM are covered in Chapter 5. Chapter 6 serves as the conclusion with recommendations, answers to the research question, and implications for future research is discussed, which concludes the research.

1.2. Problem Statement of the Study

The integration of artificial intelligence (AI) into human resource management (HRM) methods is transforming organisational operations globally (Tambe et al., 2019). While organisations in developed nations have made significant progress in AI adoption within HRM, there is a notable research gap in AI application in emerging markets, particularly in South Africa's manufacturing sector (Smith, et al., 2024), leaving a considerable knowledge gap in understanding the specific opportunities and challenges of AI adoption in the South African business environments.

Behera and Kapoor (2023) emphasise that, while AI presents revolutionary prospects for HRM practices, there is a lack of empirical research documenting its actual deployment and consequences in South African organisations. The absence of comprehensive research examining AI's impact on HRM practices in South African manufacturing companies has resulted in organisations lacking contextually relevant guidance for AI implementation strategies.

Furthermore, while global studies emphasise AI's potential benefits for human resource management (Anderson & Lee, 2023), there is a lack of understanding of how these benefits transfer in South Africa's particular socioeconomic and technological landscape. Therefore, this study addresses this critical knowledge gap by investigating the specific impact of AI on HRM practices within a manufacturing company in Durban, South Africa, providing valuable insights for both academic literature and practical implementation strategies in similar contexts.

1.3. Aim of the Study

This dissertation explores the impact, opportunities and challenges of embracing artificial intelligence in Human Resource Management practices, focusing on AI's impact on a manufacturing company in Durban, South Africa. By conducting an investigation into the current state of AI adoption in HRM in South Africa, this research aims to provide valuable insights for HR professionals and business leaders, enabling them to keep abreast with technological changes and create a competitive advantage for their businesses.

Now that Al and HR have been integrated, HR managers must decide how AI should be permitted to impact HR procedures (Behera and Kapoor, 2023). HR Leadership is responsible for strategic human capital change, evolution, and adaptation of new and innovative ways to enable business performance. This study will, therefore, enable and empower HR Leadership's AI enablement approach.

1.4. Research Questions

1. What is the current state of AI adoption in HRM in a manufacturing company, in Durban, South Africa?
2. What are the opportunities and challenges of implementing AI in HRM in a manufacturing company, in Durban, South Africa?
3. How does AI impact critical HRM functions within a manufacturing company in Durban, South Africa?

1.6. Research Objectives

1. To investigate the current state of AI adoption in HRM in a manufacturing company, in Durban, South Africa.
2. To explore the opportunities and challenges associated with using AI in HRM in a manufacturing company, in Durban, South Africa.
3. To explore the overall impact of artificial intelligence on critical HRM functions in a manufacturing company in Durban, South Africa.

1.7. Research Methodology

To fully explore the factors, the study took a qualitative approach. Primary sources were interviews with HR professionals from the company. Secondary sources included academic publications, case studies, and literature reviews on AI's evolving role in the industry, specifically relating to the HR function. The sample consisted of 12 participants, including HR managers and HR practitioners at the company. Thematic analysis was adopted to analyse the responses and create themes using Nvivo software, which was further discussed.

1.8. Significance of the Study

This research focused on assisting management and human resources in developing an effective plan to understand the impact of AI and enabling the human resources departments to address and consider the factors that would positively and negatively impact the organisation. Choudhury (2020:2) explains, "From research, 50% of employees in this day use some type of Al in the office, up from 2018 where it was 32%.". As businesses navigate the intricate interplay of technology and human resources, grasping AI's specific opportunities and challenges in HRM is critical. Through this dissertation, further contributions and discussion to the evolving topic of the role of AI in defining the future of work will be enabled through a manufacturing company in Durban, South Africa.

1.9. Limitations of the Study

Every research study will have limitations that a researcher must address, and in some situations, accept. This study's limitations include the following:

- The study focused on a single manufacturing company in Durban, South Africa, which ay limit the applicability of the findings to other sectors or regions.
- The study focused on the current status of AI adoption, which may not completely capture long-term effects or trends requiring continuous research.

1.10. Structure of the Dissertation

Chapter 1: The Introduction describes the problem and its context. It clarifies the study's significance, goals, and objectives, as well as its format.

Chapter 2: This chapter focuses on the literature review, providing an in-depth and critical examination of pertinent material. The study commenced with creating an understanding of AI and thereafter concentrated on the impact of AI in HRM, the impact on functional areas of HRM, and the opportunities, challenges and ethical considerations associated with AI in HRM.

Chapter 3: Research Methodology describes the methods used to validate the researcher's theory. It also includes information on the research design and instruments employed.

Chapter 4: Presentation of Findings displays the study's findings that address the research questions. This chapter summarises interviews and study findings. It explores how HR Managers and HR Practitioners adapt to AI's technological shift in HRM.

Chapter 5: Discussion of Findings presents how the study's findings relate to existing information. The article compares the findings to previous research on AI in HRM and discusses their practical implications.

Chapter 6 provides study conclusions and recommendations for AI in HRM based on the impact opportunities, challenges and ethical considerations in the South African business context.

1.11. Conclusion

This chapter describes the study's focus on evaluating the impact of AI on Human Resource Management in a manufacturing company in Durban, South Africa. As AI continue to disrupt numerous industries including human resource management, it is critical to grasp its ramifications in the South African environment. The study aims to investigate the present state of AI deployment, identify opportunities and challenges, and assess AI's impact on essential HR

functions in the manufacturing industry. Chapter 2 will conduct a literature review, providing literature and suggestions to help HRM practices effectively integrate AI.

Chapter 2: Literature Review

2.1. Introduction

The convergence of AI and HRM is reshaping the global landscape of the manufacturing industry, with significant implications for South Africa's manufacturing sector. This literature review aims to comprehensively explore AI's role in HRM within the manufacturing context, focusing on the South African environment.

The review begins with an overview of AI, tracing its evolution in business and examining key concepts such as machine learning, deep learning, natural language processing, computer vision, robotics, and expert systems (Russell and Norvig, 2022). It then delves into AI's specific applications in manufacturing, highlighting areas like predictive maintenance, quality assurance, and supply chain management (Lee et al. 2018).

The focus then shifts to Human Resource Management in the manufacturing industry, discussing crucial HRM practices including recruitment and selection, learning and development, performance management, and employee engagement. This sets the stage for examining the current state of AI adoption in HRM within manufacturing globally and in the South African context.

The review explores AI's opportunities for HRM in South African manufacturing, such as improved efficiency in recruitment processes, enhanced performance management systems, and personalised learning and development programs. Simultaneously, it addresses the challenges of AI implementation, including data privacy issues, workforce readiness, and the need for ethical considerations in AI-driven decision-making (Tambe et al. 2019).

By synthesising current research and industry reports, this literature review aims to understand how AI transforms HRM practices in manufacturing. It seeks to identify gaps in existing knowledge, particularly in the South African context, and to highlight future directions for research and practice in this rapidly evolving field.

Through this comprehensive analysis, the review will contribute to a deeper understanding of the potential of AI to revolutionise HRM in South African manufacturing while also acknowledging the unique challenges and opportunities presented by the local context. This foundation will inform subsequent research sections, guiding the development of strategies for effective AI integration in HRM practices within South Africa's manufacturing sector.

2.2. Artificial Intelligence: An Overview

Over the years, the world has been evolving towards a digital future, and Industry 4.0 technologies are widely seen as the way forward (Kumar, et al. 2022). One of the most visible of these technologies (including blockchain, IoT, cloud computing, and so on) is artificial intelligence (AI) (Dirican, 2015), which is described as computers' ability to communicate with and emulate human capacities (Schutzer, 1990). AI enables problem-solving with more precision, speed, and a more significant number of inputs. AI is neither a new subject nor a new academic field of research (Huin, et al., 2003); nonetheless, only recently have technical breakthroughs demonstrated that AI has a large set of applications (Min, 2010).

Significant advances in AI have occurred in recent years. While AI has been a focus of academic and scientific attention for decades, technical developments in recent years have fully demonstrated its immense potential across a wide range of industries. In the business world, AI has emerged as a potent tool for improving decision-making processes, increasing operational efficiency, and stimulating creativity. HR, which has historically lagged in digital transformation, now sees an opportunity to accelerate with AI. This technology promises to simplify tedious activities, improve talent acquisition, reduce staff turnover, and increase engagement (Vishwanath & Vaddepalli, 2023). This rapid integration of AI into company operations has revolutionised existing procedures and created new opportunities for product development, customer service, and strategic planning. As we delve deeper into the world of AI and its business applications, it becomes vital to understand the definitions of artificial intelligence.

2.2.1. Definitions of Artificial Intelligence

AI is increasingly used in various commercial processes, including HRM. As AI technologies evolve and are integrated into HR processes, it is critical to understand how AI is defined in this context. This literature study seeks to investigate and synthesise multiple definitions of AI as they apply to human resource management, highlighting major themes and views from academic and professional sources.

The definition of AI has evolved and is still debated by scholars and practitioners. McCarthy et al. (2006:3) proposed one of AI's earliest and most enduring definitions as "the science and engineering of making intelligent machines." Their concept, given in 2006, represents the early optimism and broad vision for AI as a science that includes theoretical knowledge of intelligence and the practical development of intelligent computers.

AI is roughly described as creating computer systems capable of executing tasks that generally need human intelligence (Russell and Norvig, 2022). This definition of AI is more sophisticated, recognising that it may be interpreted from various angles, including thinking humanly, acting humanly, and reasoning rationally. This multifaceted perspective has influenced how researchers and practitioners approach AI development.

Kaplan and Haenlein (2018) have significantly contributed to understanding AI in a business environment. Their 2019 research built on their previous work, which sought to demystify AI for business leaders and provide a framework for understanding its potential uses. As Kaplan and Haenlein (2019:14) state, “these tasks require a wide range of skills, including visual perception, speech recognition, decision-making, and language translation”. Davenport and Ronanki (2018) highlighted that AI has evolved from a science-fiction notion to a disruptive force in corporate operations across multiple industries. Davenport and Ronanki’s (2022) research is essential to closing the gap between academic understanding of AI and its business applications. Their classification of AI technologies as process automation, cognitive insight, and cognitive engagement offers a valuable foundation for businesses to comprehend and use AI solutions.

Haenlein et al. (2019) describe AI as a system's ability to accurately understand external data, learn from it, and apply that learning to fulfil specified goals and tasks through flexible adaptation. This

definition emphasises AI's capacity for data interpretation, learning, and goal-oriented action. Davenport and Ronanki (2018) classify AI technologies in business into three categories: process automation, cognitive insight, and cognitive engagement. This classification provides a foundation for comprehending AI applications in various corporate domains, including HR. Russell and Norvig's (2020) fundamental work on AI offers four approaches to defining AI in a business context, i.e. human-like cognitive systems. These systems behave like people, are capable of rational thought and behave rationally. Kaplan and Haenlein (2019:17) offered a more specific definition: "Artificial intelligence is a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation." This definition highlights the critical aspects of data interpretation, learning, and adaptability characterising modern AI systems.

AI is a science that tries to reproduce features of human intellect such as learning, reasoning, sensing, critical thinking, etc., using logic-guided computer programs (Vilani, 2018). Kaplan and Haenlein's (2018) research expressed that AI can accurately absorb input, learn from it, and use it to achieve specified objectives and tasks through flexible implementation.

For this study, the definition that would be most relevant to understanding the impact of AI on Human Resources and the South African context is the definition provided by Sanyaolu and Atsaboghena (2022:4) “Human intelligence is enhanced by artificial intelligence, as it relieves employees from carrying out tasks that can be automated, thereby enabling them to develop their skills and knowledge more productively”.

According to Sanyaolu and Atsaboghena (2022), artificial intelligence in HRM improves human intelligence by automating routine work, freeing up HR practitioners to focus on more strategic activities. In South Africa, this technology can alter various HR functions such as talent acquisition, learning and development, performance management and engagement. AI currently reduces an HR professional's burden on monotonous chores, allowing them to focus on initiatives to boost employee satisfaction, productivity, and organisational alignment.

2.2.3 Key Concepts in Artificial Intelligence

As per the definitions, AI has emerged as a transformational force in various industries, changing how we approach complicated issues and jobs. As a vast branch of computer science, AI seeks to construct computers capable of executing activities that generally need human intelligence. These activities include visual perception, speech recognition, decision-making, and language translation. These technologies are transforming numerous organisational processes, decision-making, and human resource management areas. Below are some of the critical domains within AI that are shaping our present and future;

2.2.3.1 Machine Learning (ML)

Machine Learning (ML) is a subset of AI that focuses on the creation of algorithms that can learn from data and make predictions or judgements (Jordan & Mitchell, 2015). ML is classified into three types: supervised learning, unsupervised learning, and reinforcement learning. As described by Mahesh (2018), ML is the scientific study of algorithms and statistical models that computer systems employ to complete tasks without being explicitly programmed. Many of the applications we use daily rely on learning algorithms. When an online search engine such as Google is used to search the internet, it works effectively because it uses a learning algorithm to rank websites. The primary benefit of employing machine learning is that once an algorithm understands what to do with data, it can do its tasks automatically.

Therefore, ML is a crucial AI concept that allows systems to learn from data without explicit programming. It is predicated on the notion that systems can recognise patterns in data, learn from them, and make decisions with little human intervention. In human resource management, machine learning algorithms may analyse employee data to anticipate turnover risks, identify high-potential individuals, and improve recruitment procedures by screening resumes more effectively.

2.2.3.2 Deep Learning

This entails training models using labelled data. The algorithm learns to translate input data to predetermined output labels. A specialised form of machine learning that uses artificial neural networks with multiple layers to model and process complex patterns in data (LeCun, et al., 2015). Deep learning enables computational models of many processing layers to learn data representations at multiple levels of abstraction. These techniques have significantly advanced the state-of-the-art in speech recognition, visual object recognition, object detection, and various other fields.

2.2.3.4. Natural Language Processing

The branch of artificial intelligence is concerned with the interaction between computers and humans using natural language. Natural Language Processing (NLP) allows machines to perceive, interpret, and generate human language (Hirschberg & Manning, 2015). Jain et al. (2018) describe the importance of natural learning processing as vital in the future because it allows us to create models and processes that accept chunks of information as input, whether in the form of speech, text, or both, and change them according to the algorithm inside the computer. NLP strives to close the gap between human communication and computer understanding. Businesses utilise chatbots and virtual assistants to manage customer enquiries, while HR departments use NLP tools to analyse employee feedback and improve internal communications channels.

2.2.3.5. Computer Vision

This field of AI trains computers to interpret and understand the visual world, enabling machines to identify and process images like human vision (Szeliski, 2022). As explained by Karn (2021), Computer Vision is a multidisciplinary subject that can be informally classed as a subfield of artificial intelligence and machine learning, both of which may involve using particular methodologies and general-purpose learning approaches. Computer vision studies show how computers obtain high-level knowledge from digital images or films. In manufacturing, for example, robots with machine vision can inspect for flaws and even respond to changes in the

production process. This level of automation improves productivity by reducing the need for human intervention in repetitive and dangerous jobs (Zhang, 2023). In human resource management, computer vision can monitor employees to ensure compliance and quality, further optimising production processes.

2.2.3.5. Expert Systems

The most basic type of AI is a rule-based expert system, which solves problems by following specified processes. The purpose of an expert system is to encapsulate a human expert's knowledge into a set of rules that can be automatically applied to data (Talukdar et al., 2023). Therefore, an expert system is a sort of artificial intelligence program that simulates the decision-making abilities of a human expert in a specific topic or field. In HRM, they can help with performance evaluation, pay planning, and policy compliance.

2.2.3.7. Artificial Generative Intelligence

In the ever-changing environment of human resources (HR), generative AI has emerged as a valuable tool (Vishwanath & Vaddepalli, 2023). Artificial Generative Intelligence (Gen AI), a subset of artificial intelligence, represents a transformative technological advancement capable of creating new content, including text, images, code, and data patterns based on training from vast datasets. Notable examples like ChatGPT, MidJourney and DALL-E have demonstrated the ability to engage in human-like interactions, generate creative content, and assist in complex problem-solving tasks (Brown, 2023). These systems utilise large language models (LLMs) and deep learning architectures to process and generate contextually relevant responses, making them particularly valuable for business applications and organisational processes.

2.2.3.8. Artificial General Intelligence

Artificial General Intelligence (AGI) is the hypothetical ability of an AI system to comprehend, learn, and apply its intelligence to tackle any intellectual problem that a human can (Pennachin and Goertzel, 2007). Chollet (2019) contends that obtaining AGI necessitates the development of systems with significant generalisation capabilities and presents a framework for tracking progress towards this aim. AGI would exhibit human-like flexibility, adaptability, and transfer learning, allowing it to apply knowledge and abilities to unexpected contexts without requiring special training. This concept goes beyond present AI capabilities, picturing computers capable of abstract reasoning, strategic planning, and even self-awareness.

Artificial intelligence technologies are revolutionising company operations and reshaping human resource management's function. They provide chances for greater efficiency, data-driven decision-making, and better employee experiences. However, its application poses significant ethical concerns and requires careful supervision of the human-AI interface in the workplace. Therefore, in current AI development, people are still primarily required to manage and audit these processes. The evolution of AI from a theoretical notion to a realistic, complex technology has significant consequences for organisations, notably in human resource management. AI's ability to execute activities that formerly needed human intelligence brings up new opportunities for automating numerous HR procedures, potentially enhancing efficiency and lowering costs.

2.3. AI applications in manufacturing

AI is revolutionising the manufacturing sector by providing previously unheard-of chances for productivity, efficiency, and creativity (Plathottam et al., 2023). AI has the potential to be extremely helpful in manufacturing, particularly in applications such as predictive maintenance, quality assurance, and process optimisation. The many uses of AI in manufacturing are examined in this section, emphasising how these applications may affect human resource management.

The Fourth Industrial Revolution, or Industry 4.0, is defined by the convergence of digital, physical, and biological technologies, with artificial intelligence (AI) at its core (Xu and Li, 2018). The fourth industrial revolution, or Industry 4.0, is primarily made possible by integrating machine learning (ML) and AI with other developing technologies. ML and AI are concepts from computer science theory that are transformed into practical technologies (Plathottam et al., 2023). This is seen in the manufacturing industry as "smart manufacturing," where AI-driven systems improve quality control, forecast maintenance requirements, and optimise production processes. (Lee et al., 2018). Figure 2.1. below illustrates the range of AI/ML applications across various manufacturing disciplines, categorised according to whether they fall under the purview of automation, design, or operations and how they can be applied in a manufacturing environment.

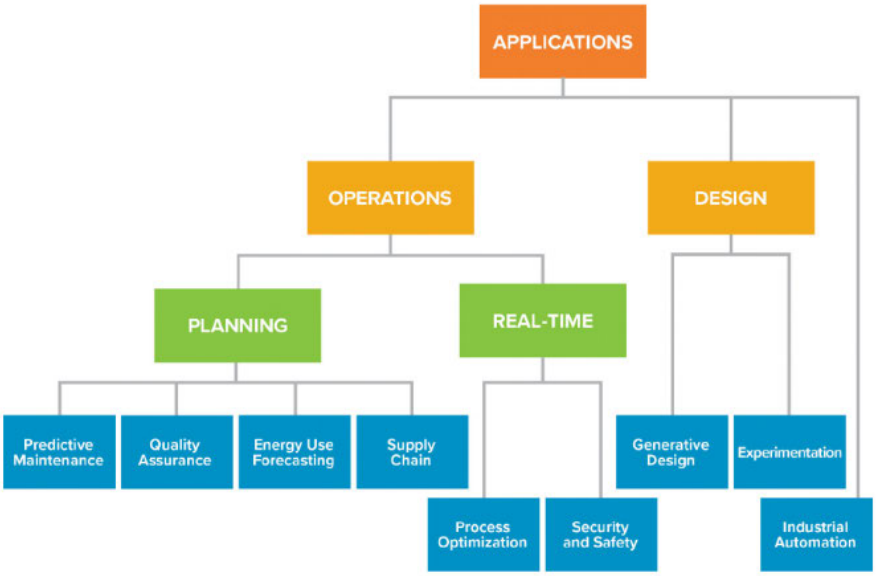

Figure 2.1: AI/ML applications in the manufacturing industry

Source: (Plathottam et al, 2023, p.8)

2.3.1. Predictive Maintenance

Predictive maintenance is one of AI's most significant uses in manufacturing. AI algorithms can forecast when equipment is likely to break by evaluating sensor data and past performance, which enables proactive maintenance scheduling (Carvalho et al., 2019). Predictive maintenance can also reduce the possibility of unscheduled outages that could harm communities, employees, and the environment (Plathottam et al., 2023). This cuts down on downtime and has workforce

management ramifications, possibly changing the duties and work schedules of maintenance staff and enabling human resource departments to plan their manpower better and better equip human resources with data and analytics to manage manpower.

2.3.2. Quality Assurance

Ensuring quality assurance brings several benefits, such as lowering expenses and waste and preventing quality failures. It further creates a competitive advantage for the organisation. AI/ML models have demonstrated the potential to improve quality control in a variety of industrial industry applications (Plathottam et al., 2023). Computer vision systems driven by AI are revolutionising manufacturing quality control. These technologies are capable of far faster and more accurate defect and anomaly detection than humans (Wang et al., 2020). Although this improves the quality of the product, it also requires human resource departments to review the roles of quality control professions so that they evolve into the skill sets that are now needed to complement the AI processes.

2.3.3. Supply Chain

Supply chain optimisation, demand forecasting, inventory management, and logistics streamlining are all being done with AI algorithms (Toorajipour et al., 2022). To increase the usefulness of their supply chains, many businesses are moving away from remote monitoring and towards control, optimisation, and ultimately sophisticated autonomous AI-based systems (Kohtamäki et al., 2019). Businesses may make informed decisions on purchases and product sales in real time by utilising artificial intelligence (AI) and real-time data analysis to gain important insights into market circumstances and trends (Plathottam et al., 2023). It is clear that AI is being used in all areas of manufacturing; it is affecting operations, supply chain management, logistics, and procurement which ultimately has an impact on the human resources strategy and approach to AI adaptation.

As per Figure 2.1, the core impact of AI applications in manufacturing has been discussed, making it clear that the widespread use of artificial intelligence (AI) in manufacturing has important ramifications for human resource management. AI is replacing repetitive activities in many traditional manufacturing professions, freeing individuals to concentrate more on their work's strategic, creative, and interpersonal parts (Brynjolfsson & Mitchell, 2017). Therefore, the rapid evolution of AI technology necessitates that HR departments remain knowledgeable and agile, always reassessing how these tools might be integrated into their operations and management of their people resources.

As the discussion progress into AI in human resource management, it is evident that the sector is about to undergo substantial transformation. The evolution of AI from broad, aspirational concepts to practical, business-oriented applications indicates that HRM will undergo significant changes in how it operates and the value it provides to organisations. The following sections will go more deeply into these specific applications and their implications for the future of human resource management.

2.4. Contextualising Human Resource Management in the Manufacturing Industry

Human Resource Management (HRM) is crucial in the manufacturing industry, significantly influencing organisational performance and competitiveness. This section delves into key HRM practices in the South African industry.

2.4.1. Key HRM practices in manufacturing

HR plays a crucial role in overseeing the workforce's shift to new working practices in the context of Industry 4.0 (Olurin et al., 2023). Galanti et al. (2023) point out that organisations must build up learning and training programmes to assist employees in gaining new skills in light of the rapid technological advancements. HR specialists are primarily responsible for ensuring that the workforce is prepared to meet the opportunities and challenges of digital transformation.

The fourth industrial revolution (i.e., Industry 4.0), which introduced the digital transformation of businesses, is propelling the industry towards sustainable development (Mijatović et al., 2020). Human resource management (HRM), as part of the Industry 4.0 evolution, is critical to digital transformation since employees are the most adaptable component of the manufacturing system. As per Mijatović et al. (2020), HRM is crucial in manufacturing organisations, particularly in the Industry 4.0 age, when production processes are becoming increasingly complicated and quick. HRM is seen as one of the key means by which organisations may shape their employees' skills, abilities, behaviour, and attitude and guarantee that their activities are aligned with the organisation's goals.

The way HR departments run, from hiring and training to performance management and employee engagement, will be significantly impacted by this change (Olurin et al., 2023). Glaister et al.'s (2018) research investigated the links between HRM practices, employee performance, training and development skills, the recruitment process, and overall corporate performance. Based on the findings, it was determined that successful HRM methods had a favourable impact on overall employee satisfaction and corporate performance. These factors will be further explored below:

2.4.1.1. Recruitment and Selection

Recruitment and selection processes are critical for identifying qualified workers capable of operating complex machinery and adapting to technological advances (Anyim et al., 2011). Employees are frequently viewed as the organisation's most valuable asset since they are an essential component of the organisation's success (Francis, 2014). The issues faced by manufacturing organisations include finding and keeping the best staff so they can continue to lead their respective markets (Hee et al., 2018).

Manufacturing recruitment and selection have become more challenging as a result of Industry 4.0's rapid technical improvements. As manufacturing processes grow increasingly automated and digitised, workers' skill requirements have changed drastically (Kagermann, 2015). This has resulted in a rising skills gap in the manufacturing industry, necessitating that HR professionals

modify their recruitment tactics to attract applicants with the appropriate combination of technical and soft skills (Lahiri & Schwartz, 2018).

A new tug-of-war has begun between enterprises, organisations, and industries competing in the labour market for the most suitable, skilled, and energetic people in the age of technological developments (Oswal et al., 2020). AI has impacted Human Resource Management, among other business fields. The new HRM terminology was designed under Industry 4.0. (Bondarouk & Brewster, 2017). HRM performs various critical functions for a manufacturing organisation, including recruitment, selection, and hiring, as well as training, development, and talent acquisition for organisational development (Nawaz, 2019). To attract and retain talent, human resources must establish recruitment-related duties. AI enables HR managers to make effective recruitment decisions based on intelligent data (Oswal et al., 2020).

Essential HRM practices are subject to a changing manufacturing landscape driven by Industry 4.0 technology, which has profoundly impacted human resource management techniques. While recruitment and selection are still essential responsibilities, their performance increasingly depends on an organisation's capacity to promote ongoing learning and development. As manufacturing processes become more complicated and digitised, the most successful organisations will be those that can attract top talent while nurturing and developing it over time. This realisation prompts us to evaluate the importance of learning and growth in current manufacturing contexts.

2.4.1.2. Learning and Development

Learning and development programs are critical for keeping employees' skills updated with developing manufacturing technologies (Dessler, 2020). Organisations must build training programs that enhance employees' inventive talents and learning (Mijatović et al., 2020). Furthermore, organisations should offer their employees several sorts of training to enable them to do a variety of tasks (Bakator et al., 2019). Personnel should be trained to address numerous problems they confront rather than simply performing typical jobs (Prieto & Perez-Santana, 2014). There is a positive correlation between the usage of HRM practices and the adoption of digital

technology in manufacturing organisations. More specifically, if a company tends to nurture its personnel and provide opportunities for further development, it is easier to incorporate digital technologies into regular procedures (Mijatović et al., 2020).

Therefore an essential HRM practice in manufacturing is learning and development, which is a critical method for improving employee performance and fostering growth in terms of efficiency, productivity, job satisfaction, motivation, and innovation within the organisation (Arulsamy et al., 2023). HRM in manufacturing must, therefore, ensure they address the skills gaps in their industry to ensure that their operations are viable (Rotatori et al., 2021). HRM plays an essential part in the digitalisation process because employees should be prepared for the changes that Industry 4.0, together with the challenges and opportunities of digital technology in the production environment (Kagermann et al., 2021).

As stated above, HRM practices in manufacturing have a key role in skills empowerment, particularly those focused on staff development, and have been demonstrated to have a favourable correlation with successful digital technology adoption. Manufacturing businesses that invest in comprehensive training programs can better prepare their personnel for technological advancements, close skill gaps, and sustain competitiveness in an ever-changing market landscape. As people learn new skills and adapt to evolving technology, it is critical to have robust systems in place to monitor, evaluate, and improve performance, which will be further discussed.

2.4.1.3. Performance Management

An essential practice of human resources in manufacturing is the management of performance. Therefore, performance management must be aligned with the aims of continuous improvement and technical innovation, ensuring that training and development investments provide concrete results for both personnel and the organisation. Performance management systems frequently include measurements for production efficiency, quality control, and safety compliance (Armstrong & Taylor, 2014). Business success is favourably connected with high-performance HRM systems (Björkman & Xiucheng, 2002). Performance-based incentives are often used in compensation and reward methods to encourage employees and increase productivity

(Bhattacherjee, 2012). Performance management is a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the organisation's strategic goals (Smither & London, 2013)

With human resources (HR) taking on the role of strategic partner, HR executives are constantly embracing new technology to ensure that human capital is productive and fulfils organisational goals, as well as strategically and technologically developing them to give even better performance (Ukweni & Adelani, 2024). The introduction of Artificial Intelligence (AI) in the HR field has begun to reshape this environment, providing a more nuanced, complete, and impartial examination of performance measures (Brougham & Haar, 2017). Using AI-powered tools and platforms gives HR professionals additional capabilities for data analysis, reporting, and decision assistance. These tools help HR teams manage performance more effectively and efficiently, resulting in concrete improvements in employee appraisal processes (Nyathani, 2023).

As per the research above, performance management is a crucial function, and AI technologies provide new potential to improve its effectiveness. As manufacturing organisations traverse the complexity of Industry 4.0 and AI, HRM professionals must exploit these technologies while simultaneously dealing with their challenges. A challenge is engaging people and aligning them to this change journey, which will be discussed further.

2.4.1.4. Employee Engagement

Employee engagement activities are becoming increasingly significant in manufacturing settings to reduce turnover and improve job satisfaction (Macey & Schneider, 2008). Engagement impacts productivity, profitability, and attrition. Productivity is expected from an employee. An engaged employee delivers and contributes to the organisation's success. Engaged employees help increase profitability; therefore, these factors reduce attrition (Saxena & Srivastava, 2015).

Employee engagement has also emerged as a critical HRM practice in manufacturing. With the increasing complexity of manufacturing processes, engaged employees are more likely to contribute innovative ideas, adapt to changes, and drive productivity improvements (Markos and

Sridevi, 2010). HR professionals are implementing various strategies to boost engagement, such as regular feedback mechanisms, recognition programs, and opportunities for skill development (Gallup, 2017).

Engaged personnel adhere to organisational norms for quality, cost, leadership, and improvement (Gajdzik, 2013). Sarkar (2011) found that employees who are engaged have favourable views towards the company and are fully committed to remaining and doing their best throughout a business cycle, whether it is up or down, and are valuable assets to the organisation. Engaged employees are aware of the business environment and collaborate with colleagues to improve job performance, which benefits the organisation (Anand, et al., 2016).

As per the research above, employee engagement has become an essential part of human resource management in manufacturing environments. It improves productivity, profitability, and staff retention. Employees who are engaged are more likely to come up with new ideas, adjust to changes, and achieve productivity gains. They are also likely to follow organisational principles and have positive attitudes about their employer. Vishwanath and Vaddepalli (2023) highlight that employee engagement and retention are crucial for HR management as they impact productivity, culture, and long-term performance. HR professionals are employing various techniques to increase engagement, including feedback mechanisms, recognition programs, and skill development opportunities with which AI can now be integrated. Using AI for employee engagement strategies, industrial organisations may design more personalised, responsive, and effective techniques to foster a highly engaged workforce.

From the research cited above, it is clear that the key areas of HR practices in manufacturing have been altered with the implementation of AI technologies. As organisations manage the digital transition, HRM is critical in preparing the workforce for new challenges and opportunities (Olurin et al., 2023). Incorporating innovative technologies has transformed fundamental HRM tasks such as recruitment and selection, learning and development, performance management, and employee engagement.

Manufacturing organisations' success in the AI landscape depends on their capacity to adapt human resource management strategies to the changing technology environment. HRM may play a critical role in driving organisational success in the digital age by harnessing new technology and focusing

on continuous skill development, performance enhancement, and employee engagement, which will be further explored in this paper. The current context of key HR functions has been discussed, the next point covers the specific adoptions and role of AI in HRM.

2.5. Current State of AI Adoption in HRM Manufacturing

Artificial Intelligence (AI) in Human Resource Management (HRM) is quickly changing the face of workforce management and organisational dynamics. As businesses seek efficiency and data-driven decision-making, AI technologies are increasingly being used to streamline HR procedures, improve employee experiences, and provide strategic insights. Recent research has shown that AI benefits the field of HR (Jia et al., 2018). Human Resources (HR) has developed routinely due to globalisation and significant features in information technology, which has helped it pass over varied barriers that had been constraining it (Mellam et al., 2015). Panda's (2021) research notes that we will observe a significant increase in AI and ML in human resource management. As a result, HR professionals need to be knowledgeable about AI. Therefore, adopting AI plays a critical role in the evolution of a business to create a competitive advantage, which requires HR to be an active role player in this transition.

2.5.1. Recruitment and Selection

The Fourth Industrial Revolution focuses on the widespread use of technology, particularly the internet, robots, and artificial intelligence. Over time, the usage of information technology has grown dramatically (Asoba & Mefi, 2021). The imbalance between demand and supply of skills on the job market can result in a high number of job applications but few qualified candidates . (Cappelli, 2015). This creates a limited talent pool which all businesses try to recruit from creating a "war for talent". Sanyaolu and Atsaboghena's (2022) research indicates that AI can be used to automate repetitive operations after first analysing enormous amounts of data to identify trends, speeding up the hiring process. This saves time since some of the tiresome labour in recruiting, such as collecting applicant information, prequalifying candidates, scheduling meetings and chat times, and presenting the candidate with answers to basic enquiries may be done using chatbots.

Artificial intelligence chatbots employ natural language processing (NLP) to offer more human-like responses and make discussions more engaging and genuine. AI chatbots also use machine learning (ML) to learn from their interactions with users, allowing them to expand their knowledge base over time and provide better, more personalised experiences (Boost.ai, 2024).Further reinforced by Vishwanath and Vaddepalli (2023), Chatbots and AI-powered HR support systems have changed how employees interact with HR departments. Providing timely answers to concerns about laws, benefits, and HR information can boost employee satisfaction. The research by Koivunen et al. (2022) highlights three types of chatbots in the recruitment space.

First Type of Chat Bots: Attraction bots are designed to be a simple way to deliver contact information and a few basic facts to a potential employer in minutes. They offer an additional channel for a candidate to express their interest. Unlike traditional application channels such as phone calls, emails, or web forms, bots give an opportunistic and low-threshold approach to communicating contact information. The chatbot could ask basic enquiries such as your level of schooling and work experience.

Second Type of Chat Bots: Customer service bots can assist potential applicants in finding important information about a certain post, recruiting procedure, and hiring organisation. Such chatbots try to automate the repetitious labour that a recruiter would normally perform via emails and phone conversations, while also providing a low-threshold mechanism for applicants to ask enquiries.

Third Type of Chat Bots: While these now appear to be infrequently used, a few research prototypes and product visions have been developed (Ziang et al., 2020). Interview bots are technologically advanced chatbots that can conduct virtual interviews and thus help screen applications, which are evolving and will become a part of standard interview processes as systems are refined. Ziang et al. (2020) further discovered that it is theoretically and practically conceivable to create an interview chatbot capable of actively listening, comprehending, and appropriately responding to various types of open-ended questions from job seekers. As technology evolves, we can expect even more advanced and effective chatbots to further improve HR functions and employee experience (Siocon, 2024).

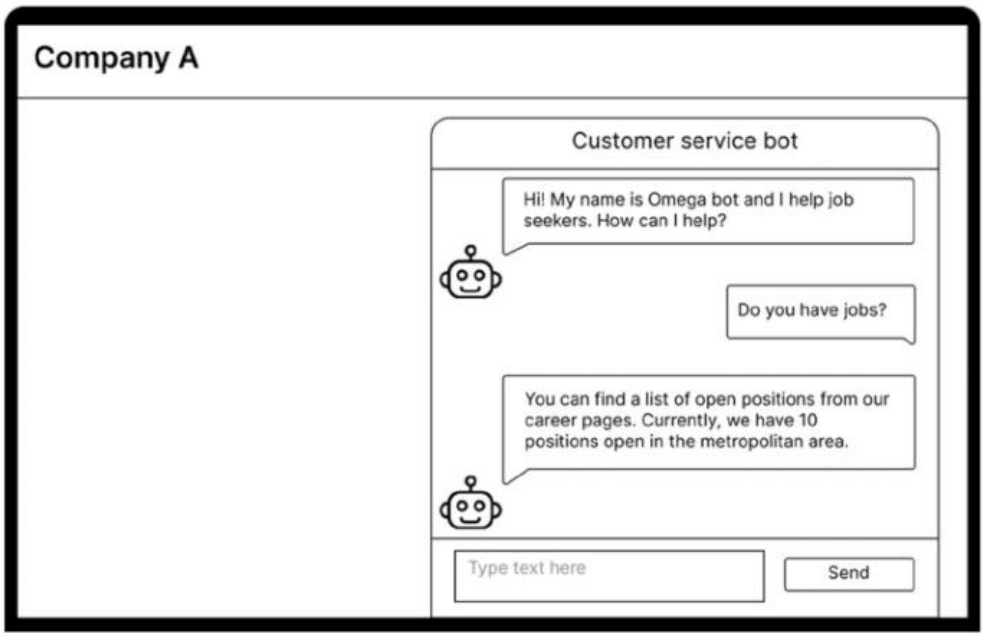

Figure 2.2: Chatbots Company A

Source: (Koivunen et al, 2022, p.495)

The research provided by Koivunen et al. (2022) illustrates two types of recruitment bots. Above Figure 2.2. (Company A) is a customer care bot, often displayed as a pop-up window in the bottom right corner of the organisation's website. A candidate can ask a recruitment-related question by entering it into the text box and pressing the send button. Below Figure 2.3 (Company B) is an attraction bot that, in addition to a pop-up window, can be more seamlessly integrated into a specific web page. Candidates can input short replies or select pre-defined options.

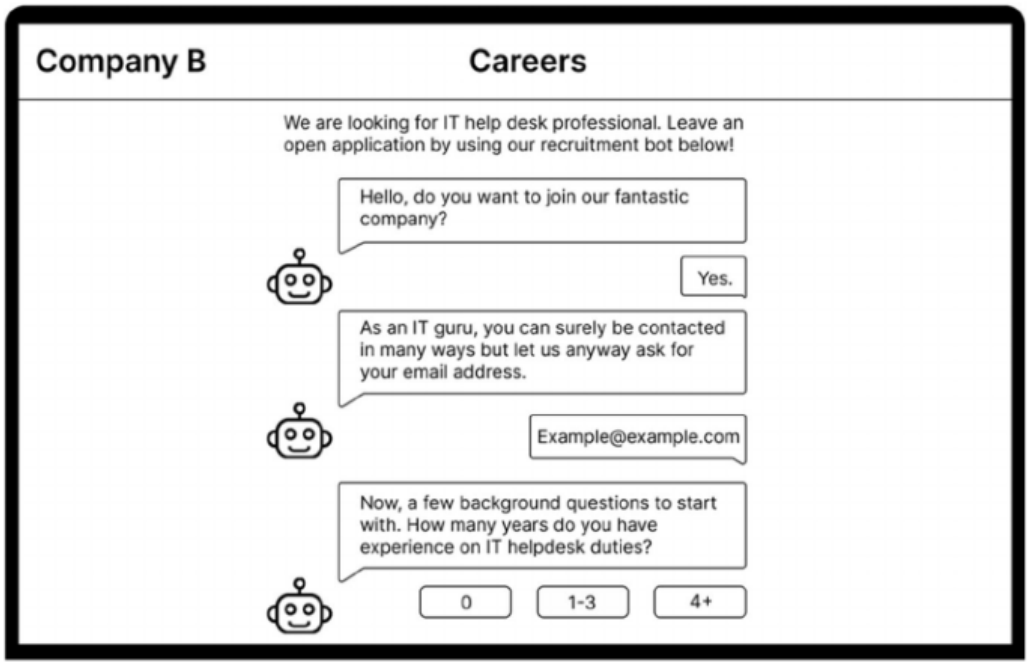

Figure 2.3: Chatbots Company B

Source: (Koivunen et al, 2022, p.495)

Various types of chatbots used in recruitment are an emerging form of e-recruitment systems that can assist recruiters in attracting potential applicants, partially automating interactions with them, and gathering basic applicant information (Koivunen et al., 2022). These AI systems schedule interviews for shortlisted candidates and send reminders automatically. AI tools such as Chatbot are used on the company's recruitment website and social media to engage every visitor who may be a future applicant. The essential characteristic of AI-embedded tools, as above, is that they employ augmented writing tools for job descriptions, allowing them to outperform any type of business and be more inclusive of diversity. This will increase transparency in the recruitment process.

Sanyaolu and Atsaboghena's (2022) research introduces Machine learning (ML) as a technique that can help evaluate large amounts of data and identify patterns that the organisation has not previously discovered. AI technology can help review CVs, select the most suitable candidates for a position, and create an Applicant Tracking System (ATS). Machine learning can potentially improve human resource management by automating routine processes, increasing productivity, and providing valuable insights into employee behaviour and performance (Mba & Ukweni, 2024).

ML can analyse massive amounts of employee data to discover trends and opportunities, resulting in increased efficiency in HR tasks such as interview scheduling, performance assessments, and meetings (Mba & Ukweni, 2024). Sharma et al.'s (2024) research reflects that HRM is now more efficient thanks to machine learning, whose flexibility has developed substantially over the last 20 years. It has raised the bar for recruiting, allowing hiring managers to evaluate the organisation. AI's impact on recruitment procedures improves efficiency and production inside the company, as well as HR operations.

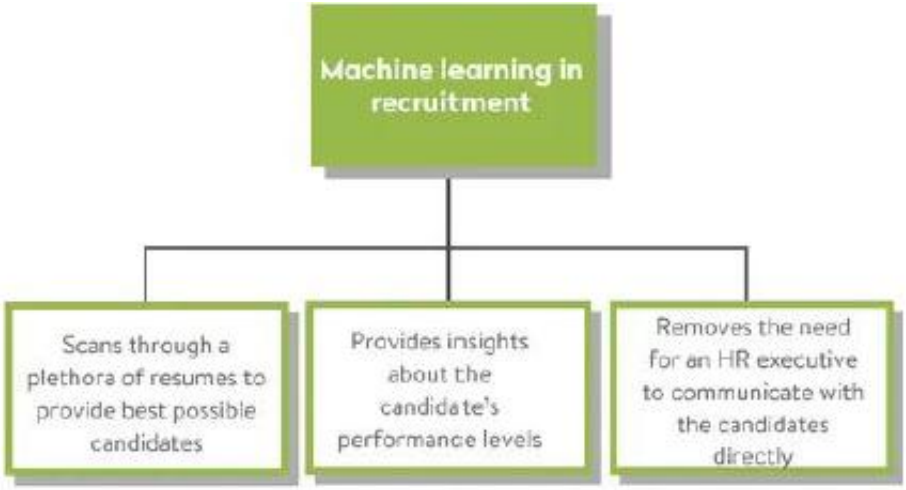

Figure 2.4: Machine Learning in Recruitment

Source: (Avcontentteam, 2024, p.4)

As per Figure 2.4. Avcontentteam (2024) reflects that the hiring process is one of the most essential components of HR management. HR automation and machine learning can significantly improve this process by refining data to refine, provide data and communicate with potential candidates. AI-powered solutions can speed up processes such as reviewing resumes, generating verdicts, and initiating interviews (Al-Hamad et al., 2023). Sharma et al.'s (2024) research found that AI, robotics, machine learning, and other advances impact various HR-related functions including recruiting, work efficiency, guiding, and planning, as well as career progression.

Most businesses struggle with engaging and re-engaging prospects because it takes time. Companies typically do not hear back from or respond to candidates after applying for a position

or an interview (Sanyaolu & Atsaboghena, 2022). Therefore, following up with them after a job application or interview is critical; otherwise, you risk losing them to more responsive competitors. AI-enabled software, such as Chabot, Applicant Tracking System (ATS), and Machine Learning in recruitment, helps to deliver real-time replies to all of the enquiries posed by candidates and provides updates on their progress.

Competency-based recruitment is a popular HRM approach in manufacturing. This method focuses on identifying and evaluating key competencies that are necessary for success in current production contexts (Dubois & Rothwell, 2004). These competencies frequently involve technical skills in robotics, data analytics, and digital systems and soft skills like adaptability, problem-solving, and cooperation (World Economic Forum, 2020).

Another central HRM technique in manufacturing is using predictive analytics for recruitment. HR practitioners can use big data and AI algorithms to uncover patterns and trends that assist in forecasting candidate success and job fit (Cappelli, 2019). This data-driven strategy can result in better-informed hiring decisions and increased retention rates, which is especially crucial in the increasingly competitive manufacturing labour market.

The above emphasises the importance of the hiring process in HR management and how AI and machine learning may help improve it. These tools can help with data refining, candidate communication, resume assessment, decision-making, and interview scheduling. According to the research above, AI, robotics, and machine learning have a wide-ranging impact on HR tasks other than hiring, affecting work efficiency, employee guidance and planning.

2.5.2. Performance Management

The incorporation of AI technology is accelerating the evolution of performance management in manufacturing. This integration changes how organisations assess, analyse, and enhance employee and organisational performance. The traditional performance management technique needs some time-consuming stages such as setting the goal, carrying out a self-assessment, supervisors' review, discussing, and signing off (Dharmatti, 2021). Aldulaimi et al. (2020) indicate that with the onset

of AI, AI can assist in real-time monitoring of established targets and provide feedback with information on what has been done and what remains to be done. AI systems are designed to handle massive volumes of data that human evaluators may overlook. They may assess not only the quality and efficiency of work but also intangible factors like collaboration and inventiveness (Nyathani, 2023). Mahmoud et al. (2019) by integrating Natural Language Processing (NLP) and machine learning techniques, AI may measure employee contributions in team settings, engagement in problem-solving activities, and their overall influence on the work environment.

In the manufacturing sector, quality, cost, safety and time are crucial to business success; therefore, efficiency and effectiveness must be continuously monitored and improved; AI brings in dimensions that allow a manufacturer to further streamline processes as noted below.

AI-powered systems can collect and analyse data from several sources in real-time, giving managers up-to-date information about employee and production line performance (Marr, 2018). This enables quick interventions and modifications to increase efficiency and quality. AI systems can analyse past performance data to forecast future trends and difficulties. This enables proactive management and helps to create realistic performance targets (Davenport, 2018).

If leveraged, HR departments can enable personalised performance feedback and automated performance evaluations, and optimise performance-based incentives and anomaly detection in performance by leveraging AI. With the utilisation of AI, personalised performance reports and feedback for employees can be generated while taking into account specific jobs, responsibilities, and performance indicators (Tambe et al., 2019). This personalisation can result in more effective performance enhancement initiatives. AI technologies can automate certain aspects of the performance review process, lowering prejudice and enhancing objectivity. Tambe et al. (2019) further state that these systems can analyse many data points, providing a holistic snapshot of employee performance. AI may offer a more beneficial feature to manufacturing, such as the ability to create patterns to detect anomalies, which benefits employee performance and overall plant performance. Agrawal et al.'s (2019) research indicate that Artificial intelligence systems can spot unexpected trends or abnormalities in performance data, alerting managers to possible difficulties or noteworthy successes that would otherwise go unreported.

AI-powered performance management entails measuring performance using more criteria than a simple rating or score. This enables improved identification of areas where an employee may need to improve and discover capabilities they may not be aware of (Smith, 2022). AI offers continuous feedback and coaching: Johnson's (2023) research indicates that AI allows managers to provide immediate direction to staff, resulting in faster skill growth and higher engagement. Real-time feedback enables staff to make quick changes, enabling continuous learning and growth.

Performance Indicator	Before AI Implementation	After AI Implementation
Employee Engagement	65%	82%
Productivity	75%	88%
Goal Achievement	60%	75%

Table 2.5: Performance Indicators Before and After AI Implementation

Source: (Subhadarshini and Biswal, 2024, p.41)

Figure 2.5 research findings by Subhadarshini and Biswal (2024) support AI's transformational potential in changing performance management. AI-powered personalisation emerges as a significant driver of employee satisfaction and engagement. Real-time feedback promotes a culture of continuous improvement by connecting individual efforts to organisational goals. Predictive analytics and bias reduction help to create a more proactive and inclusive performance review process.

From the above, AI has the potential to transform performance management. AI can help to improve employee performance management by providing personalised feedback, real-time tracking, predictive analytics, and bias-free assessments (Subhadarshini & Biswal, 2024). From the research explored the benefits of AI in performance management are substantial and offer many future opportunities, with this many ethical and data privacy concerns may arise which should be acknowledged, therefore a balance needs to be created by HR departments to ensure a balance between technology and ethics which will create a sustainable AI-assisted future.

2.5.3. Employee Engagement

As artificial intelligence (AI) continues transforming various aspects of human resources, its potential to revolutionise employee engagement has become increasingly apparent. Employee engagement is defined as employees' emotional commitment to their organisation and its goals (Macey & Schneider, 2008), which is crucial for organisational success. AI technologies are now being leveraged to enhance engagement strategies, providing personalised experiences and data-driven insights that were previously unattainable.

AI can improve employee engagement and retention through sentiment analysis, predictive analytics, personalised recognition, and ethical considerations (Vishwanath & Vaddepalli, 2023). Employee engagement in manufacturing is critical to an organisation's health and production given the complexity and vast amount of moving parts, i.e. coordination between people in various departments such as production, supply chain, planning and support services. However, it remains a significant area for improvement in organisations worldwide. Gallup's (2024) report indicates that measuring and managing engagement in an organisation is crucial to the success of employees and the organisation as a whole. Engaged employees are happier, more likely to stay, have fewer absenteeism, and work harder.

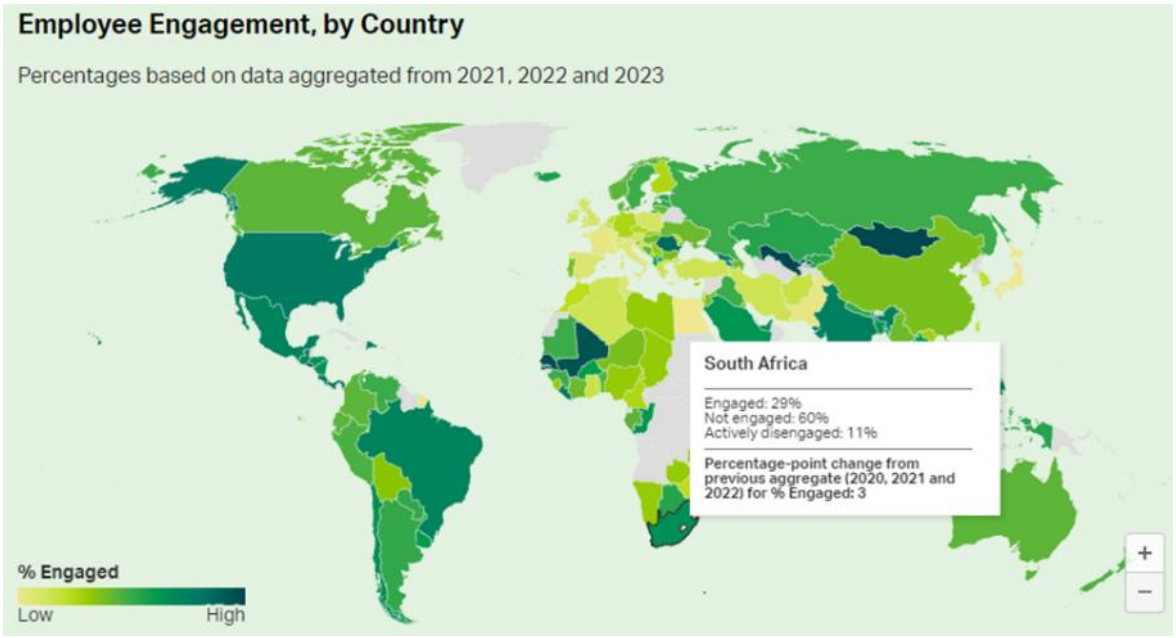

Figure 2.6: Employee Engagement by Country (Gallup, 2024, p. 3)

As per Figure 2.6, engagement levels vary by country. For this study, South Africa will be focused on: although South African employees reflect as moderately engaged as a pose to other countries, 60% of the workforce reflect as disengaged, and 11% reflect as actively disengaged, with only 29% of the working population reflecting as engaged. As new technologies like AI are integrated into the workplace, these challenges become more complex. Shuck et al. (2019) indicated that it is crucial to prioritise best practices and technologies that encourage people to use their cognitive, emotional, and physical energies at work.

Organisations may now forecast employee engagement levels using a variety of AI-powered prediction approaches. AI analytics models can be used to scan through various types of text, such as emails, chatbot messages, memos, media comments, and so on, to extract the necessary insights for analysing employee engagement (Sanyaolu & Atsaboghena, 2022). Employees' current and future engagement levels are anticipated by analysing massive databases and extracting useful information. Natural language processing (NLP) technology can translate information obtained from many sources into structured data for analysis (Mallick, 2021). This can help analyse employees' overall satisfaction with the organisation's performance. AI-based tools can save time when analysing engagement surveys and assist HR professionals in identifying employee requirements and providing prompt answers to those needs.

Further to the above, AI can be leveraged in several ways to improve engagement strategies and outcomes. AI algorithms can analyse various data points to predict attrition risk, including performance metrics, communication patterns, and employee feedback. This allows HR professionals to address potential issues and implement targeted retention strategies proactively (Tambe et al., 2019). It may be argued that employee engagement requires a personalised approach rather than a holistic approach that addresses individual engagement needs; therefore, AI’s offering of a personalised recognition program may offer a solution. AI can analyse individuals' preferences and performance data to offer personalised recognition and rewards, making these programs more relevant and engaging for each employee (Deloitte, 2020). Through natural learning processes and artificial general intelligence in manufacturing. AI can optimise shift schedules based on individual preferences, talents, and productivity patterns, potentially leading to enhanced work-life balance and higher engagement (McKinsey, 2021).

Hashim (2024) indicated that AI is helping companies provide a more immersive employee experience in a variety of ways, from helping employees work more efficiently to laying the groundwork for their jobs to evolve and expand to improving the way workers engage with customers. AI also impacts the employee experience across virtually all business functions. Therefore, manufacturing organisations may cultivate a highly engaged workforce by incorporating AI into employee engagement initiatives that are more personalised, responsive, and successful. However, to preserve confidence and promote engagement, these technologies must be implemented with much research and transparency and address any privacy and ethical concerns.

2.5.4. Learning and Development (L and D)

HR professionals enable and empower employees with the necessary skills and experience to meet individual and organisational goals through learning and development. With the onset of AI, businesses have to question the traditional approach, which will enable tailored training solutions for employees and more effectively equip employees with the skills required to fulfil their roles adequately. HR departments may now train and evaluate personnel using AI-based tools. AI tools have made it feasible to discover skill gaps and create training plans for staff members per their needs (Premnath & Chully, 2019). Sanyaolu and Atsaboghena (2022) indicate that the correct AI tools and implementation would help employees learn more effectively and quickly, resulting in improved personal and professional growth and, ultimately, higher productivity.

According to Fleming (2020), the rise of AI presents new and distinct difficulties for business leaders. They must maintain financial success while simultaneously making significant investments in hiring, training, and implementing new technologies that boost productivity and growth (Dabbous et al., 2022). With its ability to analyse and aggregate massive volumes of data, AI can uncover gaps in an individual's knowledge. Learner profiles can enhance the learning experience and teach employees new skills (Maity, 2019). AI in Learning and Development enables personalised learning materials, objectives, and information based on individual learning styles and preferences (Sohel, 2022).

According to a report by Spartaq (2020), using digital technologies for employee training can lead to a 30% boost in productivity. Employee engagement during learning via digitisation is 18% higher than traditional techniques, while learning time is decreased by 65%. Making it more attractive, the degree of memorised knowledge achieved through digital tools is up to 60% higher than traditional learning methods.

Bhatt and Muduli's (2022) research indicates that AI breakthroughs such as NLP (natural language processing), AGI (artificial general intelligence), expert systems, deep learning and robotics enable AI systems such as IVR (interactive voice response), TTS (text to speech), STT (speech to text), and TEL (technology enhanced learning) Therefore, AI's role in the L and D function becomes more effective. Sooraksa (2021) states that AI adoption can help with learning and development functions such as establishing learning needs, designing learning inputs, delivering and driving learning, deploying and documenting learning, and assessing it. Chatti et al.'s (2012) research reflects that learning analytics AI can be utilised for data cleansing, modelling, and integrating processes. It can also create learning courses, evaluate personal, system, and academic data and create virtual workshops, simulations, and gamification using Blackboard and Moodle knowledge management tools (Drewniak & Posadzińska, 2019).

Computer algorithms' machine-learning skills can aid in problem-solving (Miller et al., 2018). With the advancement of technology such as Virtual Reality (VR) learning and development can be further enabled (Yu et al., 2021). The usefulness of Massive Open Online Course and Moodle is enabled by AI (Savino, 2014). Cope and Kalantzis (2019) state that the learning experience and its application have expanded with AI, which can help learners connect with computer-mediated content, communicate with classmates and teachers, and convey knowledge through student work. Cope and Kalantzis (2019) discovered that AI assists learners and teachers in monitoring incremental progress and may facilitate personalised or adaptive learning. The important factor of AI implementation in learning and development is effective collaboration between man and machine. Bhatt and Muduli's (2022) research affirms that motivating and engaging learners through social connections, gaming, and other interactive approaches, as well as providing feedback, can all help AI-based learning succeed.

Vishwanath and Vaddepalli (2023). highlights that AI enables personalised learning and development experiences for individual employees. AI may provide tailored training programs and

materials depending on employee performance, abilities, and career ambitions. This technology-driven strategy has resulted in considerable increases in productivity, engagement, and knowledge retention compared to traditional methods. AI's natural language processing, machine learning, and data analytics skills are improving many learning and development elements, including needs assessment, content delivery, and evaluation. The successful adoption of AI in Learning and Development depends on strong human-machine collaboration, focusing on interactive and engaging learning experiences.

2.6. AI adoption in South African HRM practices

South Africa is a diverse and complex landscape with a distinct socioeconomic context; with the introduction of AI in HRM practice, significant technological transformation is required for businesses to remain competitive. AI use in South African human resource management methods is still in its early phases but is gaining traction. According to a PwC (2021) survey, 45% of South African organisations intend to incorporate AI in their human resources operations within the next three years. However, the actual implementation rate still needs to be higher when compared to worldwide standards. Rensburg et al. (2019) stated that while growing interest in AI-driven HR solutions, many South African organisations are still grappling with the fundamental digitalisation of HR processes. This suggests a significant gap between interest and actual implementation.

Myths and worries surround AI integration in HR in South Africa, as they do worldwide. There is concern about job losses, especially in entry-level and administrative positions. According to research by Zulu (2024), AI is more likely to supplement rather than replace existing roles. Wilding (2024) reports that one of the most critical issues for South African HR professionals is the country's historical setting, which includes a heritage of workplace discrimination and injustice. The deployment of AI technology must be sensitive to these challenges, with algorithms built to make fair, ethical, and unbiased decisions. HR professionals must strengthen their decision-making abilities, boost employee happiness, and propel organisations forward. Therefore, the factors below should be considered:

South Africa faces a significant skills gap in AI and data science. Khumalo and Mearns (2019) highlight this as a significant barrier to AI applications in HR departments. Data Privacy Concerns: Following the Protection of Personal Information Act (POPIA), organisations are wary about AI systems that process personal data. This legal context complicates AI deployment in human resource management. If not adequately regulated, AI adoption has the potential to aggravate socioeconomic inequality. HR professionals must also consider the broader societal implications of AI implementation, such as job displacement and wealth redistribution, and collaborate with stakeholders to mitigate negative consequences while ensuring equitable access to opportunities created by AI-driven innovation (Wilding, 2024).

While AI adoption in South African HRM practices is still in its early stages, it offers great promise for changing the HR landscape. However, the skills gap and legislative and data privacy concerns must be addressed. While AI is not widely employed in South Africa, banks are leveraging its benefits (Khumalo & Mearns, 2019). As discussed in point 2.4. A few of these innovations are being utilised in South Africa; however, from an academic and industry perspective, further research is required to ascertain the practical applications of AI in HRM in South Africa.

2.7. Opportunities of AI in HRM for South African Manufacturing

As per this literature review, AI offers significant opportunities for HR departments and the South African industry as global learnings can be refined and redefined for successful local implementation. Sonia and Sharmaa (2020) indicated that there is sufficient data in the literature to demonstrate that AI technology offers new possibilities that can lead to considerable transformation in firms and the entire economic system. The study by Sonia and EK Sharmaa (2020) examined the top 200 AI start-ups and demonstrated the impact of advanced AI research and innovation on the global marketplace. According to the study, the AI wave is underway, and the hunger for AI growth is exponential. AI investment has steadily increased over the previous six years and is expected to continue in the next few years. The survey also identifies the top AI industries that will create more possibilities in the near future, which include business intelligence, healthcare, core AI, cybersecurity, and marketing and sales. Automation, cognitive technologies,

and AI-powered data analysis have several advantages, including enhanced productivity, time and cost efficiency, reduced human error, faster corporate decisions, consumer preference prediction, and sales maximisation.

AI will bring greater time, capability, budget space, and better data (Charlier and Kloppenburg, 2017). Bandi and Verma's (2020) research indicates that Human resources departments have a significant impact on AI management. Their impact on AI is expanding to a larger capacity in human resource management. Opportunities in the HR Portfolio exist and can be leveraged to optimise human and automated work for a simpler, more intuitive work environment. Human professionals' judgement calls are and will continue to be decisive in people management.

AI has the potential to fundamentally change the field of HRM. In a similar study, Vivek and Yawalkar (2019) listed the advantages of implementing AI in HRM as impacting human relationship management, recruitment and selection, pay management, training and development, performance management, and human resource strategic planning. Vivek and Yawalka (2019) also found that AI can help reduce burden and improve workplace efficiency.

Artificial intelligence can potentially transform the recruitment and selection procedures in South African industrial enterprises. According to Naidoo et al. (2022), AI-powered applicant monitoring systems can drastically reduce recruitment time and improve candidate quality. The research revealed that AI systems could effectively screen resumes and select the most qualified candidates based on specified criteria, reducing human bias in the initial selection process. Furthermore, Pillay et al. (2023) highlighted how AI-powered chatbots and virtual assistants can improve the candidate experience by responding quickly to questions and helping applicants through the application process. This is especially useful in the South African industry, where entry-level roles sometimes receive many applicants. Merwe and Jacobs's (2023) study illustrates how machine learning can complement recruitment using algorithms that can forecast future workforce needs by analysing historical data, market trends, and economic indicators. This is especially useful for Durban's manufacturing companies that face seasonal demand fluctuations and technological changes.

Artificial intelligence provides unparalleled prospects for personalised learning and development in the manufacturing sector. Ayodele et al. (2023) found that AI has emerged as a pioneering

technology that can dramatically alter curriculum development and management of learning and development. AI allows the generation of learning content and constructing lesson programs using an altogether new process.

This is especially important in manufacturing, where upskilling and reskilling are critical for remaining competitive. Furthermore, Choi et al. (2015) state that VR technology has grown ubiquitous in the industry and has improved its cost competitiveness. As a result, it is widely acknowledged that manufacturing companies can benefit from investing in VR. This is especially valuable for training on complex machinery or hazardous processes, which is common in many Durban-based manufacturing plants.

Chilunjika et al. (2022) highligts that AI allows HRM departments to focus more on strategic areas of the company. Eggers et al. (2017) argued that AI-centered technologies can be used in human services to help organisations reduce the significant administrative load and create ample time for more acute responsibilities by refining decision-making and making low-cost and efficient delivery of services. Nyathani (2023) highlighted the shift of artificial intelligence (AI) into performance management, which marks a substantial movement away from a retrospective, ratings-focused approach and towards a more dynamic, developmental, and data-rich method. AI integration into performance appraisals and people management is more than an incremental change; it is a paradigm shift that redefines how organisations comprehend, evaluate, and cultivate their workforce.

AI in HRM practices transforms how businesses attract, retain, develop talent, engage employees and optimise data. As evidenced in the following quote, “Functions like recruitment and selection, onboarding, performance management, employee engagement, and employee retention are now performed with the help of a virtual assistant.” (Sanyaolu & Atsaboghena, 2022). As a result of the efficiencies AI offers, HR departments can now streamline their operations, make data-driven decisions, and improve employee experiences through interactive platforms such as chatbots. In this digital transformation era, the incorporation of AI into HRM marks a paradigm change toward more efficient, effective, and personalised approaches to HRM, creating opportunities that can be utilised or furthered in the South African manufacturing context.

Overall, AI presents numerous opportunities for HRM practices in South Africa, from optimising recruiting processes to improving HRM operations. As more firms adopt AI technologies internationally and locally, using AI will create further innovation and improvement in HRM practices across these areas.

2.8. Challenges of AI Implementation in HRM for South African Manufacturing

While it is clear that AI will assist in evolving and creating efficiencies in the field of HRM, some challenges need to be considered and addressed. Sanyaolu and Atsaboghena's (2022) research found that AI lacks the emotional and psychological characteristics to comprehend how it influences human conduct, passion, and ambition. "AI does not understand team dynamics or how different personalities interact. Personal relationships are also being dehumanised, as some HRM activities, such as chatbots, may be completely automated" (Fritts and Cabrera, 2021:794). Therefore, the role of an HR professional is invaluable in creating a human perspective on work objectives. Understanding and addressing these problems is critical for HR professionals seeking to maximise the promise of AI while protecting employee well-being and respecting ethical norms.

Addressing concerns about misuse and unethical use of shared data is essential to facilitate the transition to AI. All parties involved should be informed of the potential repercussions before using the technology (Sanyaolu & Atsaboghena, 2022). AI's ability to track employee activity raises concerns. As AI systems in HR think and act more like humans, ethical considerations become increasingly important. HR professionals must be aware of potential biases in AI decision-making and ensure transparency and fairness in AI-driven processes.

AI's cognitive and behavioural framing emphasises the need for HR professionals to acquire new competencies. Understanding how AI "thinks" and "acts" can assist HR teams in designing, implementing, and managing AI systems within their organisations. Based on AI's lack of emotional and psychological traits, it is impossible to monitor human emotions and understand how they can affect human behaviour, passion, and ambition (Pavlou, 2022). The system lacks a personal touch and cannot identify a new hire's unique qualities. AI lacks an understanding of team

dynamics and collaboration among diverse personalities. HR managers rely on their ability to read people in person, which technology cannot replace. AI can enhance business solutions but cannot replace human managers in certain tasks (Sanyaolu & Atsaboghena, 2022).

Manda and Backhouse (2018) highlighted that in a multi-cultural and multi-lingual country like South Africa, adopting egalitarian digital services is challenging since the process must overcome language, cultural divides, and long-standing hostility. A further challenge to address is the rich diversity of South Africa in that cultural complexity poses problems in designing AI systems capable of efficiently navigating the dense network of cultural norms, linguistic nuances, and traditional behaviours that define South African workplaces.

Ndebele (2014) revealed that integrating technologies and languages in South Africa is a critical strategic imperative that should be adopted and embraced. The linguistic diversity, which ranges from isiZulu to Afrikaans, needs AI systems that can process numerous languages and comprehend the cultural context and nuances in each language group's communication patterns. This cultural sensitivity is especially important in HR operations like recruitment, performance appraisal, and conflict resolution, where AI systems must be compatible with modern corporate needs and traditional African values.

AI systems capable of thinking and acting like humans have the potential to improve the employment experience greatly. From more personalised interactions to more sophisticated decision-making, this AI approach can result in HR policies that are more responsive to individual employee needs; however, the concern, as stated by Wisetsri et al. (2022, p.6), “the challenges of AI in HRM relates to bias, data privacy, new technology adaptation/ongoing maintenance, lack of skill sets to leverage the technology, and, in general, ethical considerations.” Therefore, further to the human element and balance between man and machine, the factors highlighted by Wisetsri et al. (2022) will be discussed:

2.8.1. Data Privacy

The application of AI in HRM demands the collection and analysis of massive volumes of employee data. In the South African context, this raises serious concerns regarding data privacy and security. Botha and Grobler (2021) emphasise that South African businesses must manage complicated legislative frameworks using AI-driven HRM solutions, such as the Protection of Personal Information Act (POPIA). The study indicates that South Africa frequently lacks the specialised legal competence required to achieve full compliance, thus exposing them to legal problems.

Country	Act	PoPI Principles								Other Areas					
		Accountability	Processing Limitation	Purpose Specification	Further Processing Limitation	Information Quality	Openness	Security Safeguards	Data Subject Participation	DPO Required	Breach Notification	Cross-border Data Transfer Limitations	Electronic Marketing	Online Privacy	Enacted Year
South Africa	PoPI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		2013
Australia	PA		✓	✓		✓	✓	✓	✓	✓		✓			1988
Canada	PA / PIPEDA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2000
Europe	EU DPD		✓	✓	✓	✓	✓	✓	✓	✓		✓			1995
Europe	GDPR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2016
UK	DPA		✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	2000
USA	*		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	*

Table 2.7: The POPI Act Compared to Privacy Laws in Leading Countries

(Botha and Grobler., 2021, p. 3)

South Africa passed the PoPI Act in 2013, based on the comparisons in Table 2.7. the POPI Act's principles are comparable to selected African and non-African data protection laws. The concern, however, is with online privacy and with the rise of AI in general, specifically AI in HRM, where large volumes of personal data are inputted and stored. Figure 2.7. reflects a concern as online privacy lags in South Africa.

The rise of AI-driven HRM systems in South Africa has raised worries regarding data privacy, particularly given the country's changing legislative landscape. While the Protection of Personal Information Act (POPIA) establishes a framework for data protection, its implementation of AI-powered HRM solutions poses particular issues. Botha and Grobler (2021) pointed out that many South African enterprises, particularly those in the manufacturing sector, lack the specialised legal competence required to fully manage this complicated legislation. This compliance gap exposes organisations to potential legal issues while raising ethical concerns regarding handling sensitive employee data. Furthermore, as shown in Figure 2.7., the gap in online privacy regulations exacerbates these concerns, primarily as HRM systems rely more on cloud-based solutions and networked databases (Maqutu, 2022).

The use of AI in HRM activities such as recruiting, performance management, and employee analytics demands the collection and processing of massive volumes of personal information. This tendency has substantial privacy consequences, as Mtsweni and Hörne (2020) highlighted in their study the ethical considerations of AI deployment in South African organisations. The researchers suggest that using AI in HRM may result in unexpected breaches of employee privacy, mainly when algorithms make choices based on sensitive personal data. This complex dilemma highlights the importance of solid data governance frameworks and increasing awareness of data privacy issues in South Africa's human resource management industry.

2.8.2. New Technology Adaptation

The existing technological infrastructure in many Durban manufacturing firms may not be adequate for AI implementation. Madonsela et al. (2019) pointed out that many South African manufacturing companies still rely on legacy systems, which can be incompatible with modern AI solutions. Upgrading these systems requires significant investment, which can be a barrier for smaller enterprises.

Effective AI implementation requires robust data management systems. However, Maleka et al. (2021) noted that many South African industrial enterprises lack the requisite data gathering, storage, and processing infrastructure. According to Maleka et al.’s (2021) findings, just 23% of

surveyed manufacturing enterprises in KwaZulu-Natal have sophisticated data management systems that can support AI technology.

These above highlight the complicated challenge of infrastructure and technology preparedness faced by Durban's manufacturing sector when adopting AI technologies. The concerns go beyond technology upgrades, including data management, integration, cybersecurity, and human resource development. Addressing these problems will necessitate collaborative efforts from corporations, educational institutions, and legislators to build a strong ecosystem supporting the adoption and maintenance of AI technology in manufacturing.

2.8.3. Lack of Skills

The use of AI in HRM necessitates a staff familiar with digital technology. However, Manda (2019) discovered that many South African manufacturing personnel lack digital literacy, particularly older workers and those in lower-skilled professions. This skill gap may result in a reluctance to adopt AI and decrease the efficacy of AI-driven HRM initiatives.

Manda (2019) further highlighted that the shortage of local training infrastructure forces companies to either invest heavily in overseas training or rely on expensive international consultants for AI implementation and maintenance. The use of AI in HRM necessitates a staff familiar with digital technology. The lack of local training infrastructure for AI-related skills in South Africa substantially impedes the mainstream use of AI technology, particularly in HRM, where the skill of digital literacy further to office software is not currently required. This gap leads businesses to make difficult decisions: either invest heavily in abroad training programs for their personnel or rely on expensive international consultants for AI implementation and upkeep.

To address these challenges, South Africa must rapidly evolve its educational and training ecosystem. The new skill sets required for effective AI implementation and maintenance go beyond traditional IT skills. Botha et al. (2022) identified several key areas where South African workforce development needs to focus: data science and analytics, machine learning engineering, AI ethics and governance, and domain-specific AI application knowledge. Furthermore, they

emphasise the need for interdisciplinary skills that combine technical AI knowledge with business acumen and industry-specific expertise. South Africa must transform its tertiary education system and vocational training programs to meet these needs. Momentum needs to be gained with the extension implementation of these educational AI programs, as well as more collaboration between academics and industry, which is required to ensure that the skills taught are relevant to the practical needs of the industrial manufacturing sector.

2.9. Ethical Considerations

The remarkable development of AI in workplaces worldwide offers enormous potential to boost business profitability. While AI has various valuable applications and can assist in accelerating corporate processes or altering systems, its use in human resources (HR) procedures and systems raises a complicated set of ethical concerns that require organisational leaders to exercise prudence (Varma et al., 2023).

Ali and Torralba's (2024) study find a multifaceted impact of AI on work performance in HR situations. The role of HR professionals discovered that AI solutions significantly improve efficiency in various HR operations. For example, 75% of respondents said that AI-driven recruiting tools simplify candidate screening processes and shorten time-to-hire by an average of 30%. AI solutions for performance evaluation also show a high level of accuracy in measuring performance parameters, with 68% of survey participants reporting improved evaluation objectivity compared to traditional techniques. However, the case study analysis revealed that AI's impact on job performance is not always beneficial.

Ali and Torralba's (2024) study reflects that Algorithmic bias is a concern, with 82% of experts identifying it as a significant issue. Experts emphasised that biases in training data could result in discriminatory consequences during recruitment and performance evaluation processes. Furthermore, 69% of survey respondents expressed concern about the lack of transparency in AI decision-making processes, emphasising the need for more explainable AI systems that provide insight into how judgements are made.

Privacy and monitoring were also significant concerns. The case study analysis found that AI-driven performance monitoring systems occasionally created a sense of perpetual surveillance

among employees. For example, one organisation's use of AI to track staff productivity indicators resulted in employee unhappiness and low morale since employees believed their every activity was being tracked. Vishwanath and Vaddepalli (2023) further reinforced in their study, highlighting that ethical considerations in data collection and use must remain a top priority to ensure responsible AI applications that respect employee privacy and rights

AI systems are only as objective as the data they are educated on and the algorithms they employ. In the diverse South African context, this poses a considerable difficulty. If AI systems in HRM are not carefully created and managed, they can perpetuate or even exacerbate existing prejudices based on race, gender, and socioeconomic position. This is primarily a concern in South Africa's manufacturing sector, which has a history of inequality.

Du's (2023) research found that ethical concerns with AI implementation include bias and discrimination, privacy and data protection, openness and explainability, and job security and automation. The use of AI in HRM requires massive data collection, which raises serious concerns about employee privacy. AI systems require access to sensitive employee data such as performance metrics, personal information, and communication logs. This comprehensive data collection may result in potential misuse or unauthorised access to personal information, jeopardising employee privacy.

Building trust and acceptability among employees requires making AI systems explainable and their decision-making processes understandable to non-experts (Doshi-Velez & Kim, 2017) . Organisations should, therefore, prioritise the creation of interpretable AI models and detailed documentation and explanations of decision-making processes. Organisations must examine the social implications of AI adoption and establish measures to support employees via reskilling and upskilling efforts (Brynjolfsson & Mitchell, 2017). Du's (2023) research indicates that to address these challenges, training programs must be provided that educate employees with new skills appropriate to growing job roles, as well as career transition support. Furthermore, organisations should investigate the potential to build new employment types that harness human skills and complement AI capabilities, thus fostering a collaborative human-AI workforce.

Ethical frameworks for AI in HR are critical for balancing efficiency and fairness. Effective frameworks should include explicit principles for openness, bias prevention, and employee

privacy. Organisations must create best practices for the ethical use of AI, including frequent audits of AI systems, employee feedback mechanisms, and ongoing training for HR professionals on the ethical implications of AI technologies (Singh et al., 2024).

As businesses adopt AI-powered solutions to expedite HR processes, they must navigate the ethical concerns that arise. The convergence of AI and HR presents fundamental concerns regarding fairness, privacy, and the human aspect of workforce management. As a result, organisational leaders must approach the technological revolution cautiously, weighing the promise of innovation against the need to maintain ethical standards in human resource management.

Finally, adopting AI in Human Resource Management within South African manufacturing creates a complicated terrain of potential and challenges. While AI can potentially improve efficiency and decision-making in HR operations, it raises ethical concerns and practical challenges. To respect the privacy rights of employees and applicants, organisations must communicate data-gathering aims, ensure data security, and acquire informed consent as needed (Vishwanath & Vaddepalli, 2023). Therefore, data privacy, technology adaption, skill limitations, and ethical implications must all be carefully addressed. Organisations must balance utilising AI's capabilities and retaining a human touch in HR procedures. The way forward necessitates a holistic strategy that includes solid ethical frameworks, extensive training programs, and adaptive measures to remove bias and assure transparency.

2.10. Conclusion

This chapter presents the literature review investigating the interaction of artificial intelligence and human resource management in a Durban, South Africa manufacturing company. The examination commenced with core AI concepts and their business growth, then moved on to numerous AI applications in manufacturing before focussing on HRM practices. The study identified significant opportunities for AI integration across crucial HRM functions, ranging from recruitment and selection to learning and development, while also highlighting unique challenges confronting

South African manufacturers, such as data privacy concerns, technology adaptation barriers, skill gaps, and ethical considerations.

The chapter reviewed both global AI-HRM practices and South Africa's specific manufacturing setting, which provided significant insights into the current status of AI adoption in HRM and a path forward for South African manufacturers. This dual perspective emphasised that while AI offers transformative prospects for improving HRM practices in manufacturing, successful adoption necessitates careful consideration of local constraints and challenges. The next chapter focuses on research methodology and describes the methods used to validate the researcher's theory.

Chapter 3: Research Methodology

3.1. Introduction

The previous chapter outlined and reviewed the influence of AI on HRM. This chapter will present the research methods to achieve the study's objectives. Research is the process of collecting, evaluating, and interpreting data to answer the research questions (Goundar, 2017). Therefore, this research methodology chapter intends to outline the research strategy used to achieve the research aims and answer the questions posed by this research. This chapter covers the research paradigm by Saunders et al. (2015): methodology, design, sample methods, data collection, and analysis techniques based on the research onion model.

3.2. Research Paradigm

The research paradigm, or the researcher's philosophical perspective, is critical in determining the approach to scientific inquiry (Creswell and Poth, 2018). It includes the researcher's ontological, epistemological, and axiological assumptions, which influence the methodology used in the study (Saunders et al., 2019). For this study on the impact of artificial intelligence on human resource management, the researcher used an interpretive paradigm.

Interpretivism holds that reality is socially produced and that people's perceptions and experiences impact their interpretation of things (Myers, 2020). This paradigm is beneficial for investigating the complicated and relatively new convergence of AI and human resource management, where various stakeholders may have different perspectives and experiences. Unlike positivism which seeks objective, generalisable facts, interpretivism recognises the subjective aspect of social reality and the significance of context in comprehending human behaviour and organisational dynamics (Collis & Hussey, 2014).

Several criteria, including the contextual significance, justify the use of interpretivism in this study: The deployment and effect of AI in HRM in a South African manufacturing sector bring distinct difficulties and opportunities that may differ from the global context. Interpretivism allows for a

thorough investigation of these contextual nuances. As the study investigates the convergence of technology and human resource management, it is critical to evaluate HR professionals' and employees' lived experiences, views, and adaptations (Saunders et al., 2019).

Following the interpretivism paradigm, this study uses qualitative research methodologies to collect rich, thorough data about HR managers' and practitioners' experiences and viewpoints on AI implementation in HRM practices. Through interviews, the researcher hopes to understand how artificial intelligence is transforming human resource management in the context of a Durban-based manufacturing company.

3.3. Research Approach

Bhattacharjee (2012) defines a research methodology as the plans and processes to achieve study objectives. Creswell and Creswell (2018) distinguished between deductive quantitative and inductive qualitative research approaches. The deductive technique tests hypotheses and confirms theories, whereas the inductive approach explores novel facts to conceptualise theories. The study followed an inductive qualitative approach that aligns with the interpretive paradigm.

According to Patton and Cochran (2002), qualitative methods are effective when researchers aim to answer questions such as 'what', 'how', or 'why' to understand better why certain things happen in a prescribed way, rather than focussing on 'how many' or 'how much'. Quantitative methods, on the other hand, do not allow the researcher to get the facts of why certain things happen and gauge the perception of others.

Bailey (2013) states that qualitative research methods have gained widespread acceptance in many fields that investigate the development of new products and services. They are also an effective tool for investigating the meaning behind what participants think about the things they encounter in their daily lives and how they are motivated by their surroundings. This study would employ qualitative research methods to understand the impact, opportunities and challenges of AI in HRM.

According to Denzin and Lincoln (2018), qualitative research excels in eliciting the meanings that people ascribe to their experiences, which is critical for investigating how HR professionals and

employees perceive and adjust to AI-driven changes in the workplace. For various reasons, qualitative research methodologies are ideal for this study, which investigates the impact of AI on HRM practices in a South African manufacturing context. First, integrating AI into HR processes is a complex socio-technical phenomenon in which the interactions between technology and human stakeholders cannot be adequately captured using quantitative measurements alone. The study aims to identify what AI technologies are being deployed, how they transform HR practices, and why specific outcomes are noticed.

The rich, descriptive data gathered through qualitative methodologies can shed light on the various obstacles, opportunities, and contextual aspects that determine the success or failure of AI integration in HR practices. This is consistent with Creswell and Poth's (2018) argument that qualitative research is best suited for examining phenomena where existing theories and research materials are sparse or contextually diverse.

3.4. Research Design

Research design is a crucial framework that specifies the methods and procedures for gathering and analysing data to answer research questions and objectives (Bhattacherjee, 2012). It serves as a framework for research, ensuring that the evidence gained allows the researcher to answer the research questions as clearly as possible (Saunders et al., 2019).

An exploratory qualitative design was chosen for this study to investigate the impact of AI on human resource management in a Durban manufacturing company. This option is consistent with the phenomenological paradigm and the study's goal of understanding the complicated dynamics of AI application in HR practices. Phenomenological research is a method of inquiry derived from philosophy and psychology in which the researcher describes the lived experiences of individuals regarding a phenomenon described by the participants. It is a qualitative method in which the researcher determines the core of human experiences with a phenomenon described by study participants (Cresswell and Creswell, 2018). This design has significant philosophical roots and usually includes conducting interviews (Giorgi, 2009).

The design's flexibility enables the adaption of research focus as new insights emerge, which is particularly important for examining developing technological implementations such as AI in

human resource management. Individual in-depth interviews were conducted with HR leaders and practitioners at a Durban manufacturing organisation to record their experiences with AI in HRM. The interviews were examined topically to better comprehend and conceptualise AI in HRM.

3.5. Study Site

The research was done at a Durban, KwaZulu-Natal, South Africa manufacturing facility. This is the company's only manufacturing facility and serves as a crucial centre for production operations throughout Africa and globally. This location was chosen because it provides a specific environment for investigating the integration of AI technologies with HRM practices in the South African manufacturing sector.

The Human Resources department at this facility comprises HR managers and HR practitioners whose roles and duties create encounters with AI technologies. These professionals are in roles that give them a unique perspective on technology integration's impact, opportunity and challenges. The department's structure enables the investigation of AI's impact on all HR functions, from strategic decision-making by managers to day-to-day operational activities performed by practitioners.

The HR department's expertise and knowledge of AI technologies cater for several facets of human resource management, such as recruitment, performance management, learning and development, and employee engagement. This extensive exposure to HR practices and the evolution of understanding and utilisation of AI makes the study site suitable for researching the research aims.

3.6. Target Population

According to Saunders et al. (2019), a target group is a subset of a larger population with certain features that can provide helpful information for researchers to answer research questions. The study's target population was HR professionals with knowledge of or interactions with AI in HRM. The target population size was fifteen (15), which includes five (5) HR Managers, seven (7) HR Practitioners and three (3) HR administrators.

3.7. Sampling Method

"Probability sampling is used for quantitative approaches, while non-probability sampling is used for qualitative approaches" Bhattacharjee (2012, p. 2). Non-probability sampling was adopted as this study entailed a qualitative approach. Therefore, subjects were selected based on specific criteria. The purposive non-probability sampling technique guided the HR managers and practitioners' sample. The purposive technique ensured that the various opportunities, challenges, and impact of AI in HRM are explored.

This study used purposive judgemental or selective sampling as part of the non-probability sampling framework. This method allows researchers to purposefully select participants based on factors related to the research Shorten and Moorley (2014). The purposive approach is especially applicable to this study since it enables the focused selection of HR managers and practitioners with relevant competence and experience in AI application within HRM contexts. Purposive sampling was used to send customised invitations to all HR managers and HR practitioners who were in roles that exposed and required knowledge of AI in HRM so that they could fulfil their roles.

3.8. Sample Size

The target sample was from a manufacturing company in Durban, South Africa, where 12 interviews were conducted. The selected sample was HR managers and HR professionals within the manufacturing company, who were equipped and, in a role, to suggest an appropriate response to the study. When considering the guidelines of purposive sampling in qualitative research, the exclusion of HR administrators from the interview sample is necessary. Participants should be chosen based on their capacity to supply rich, pertinent data that directly answer the research objectives (Saunders et al, 2019). As HR managers and practitioners work at both the strategic and tactical levels, they are equipped to provide insightful information on AI in HRM as they are more likely to be actively involved in AI-related decision-making and implementation processes, as a pose to the HR administrators.

Considering the above a total of 12 interviews with HR managers and HR practitioners from the organisation were completed effectively. These 12 interviews offered complete coverage of the research topics, and the data gathered was analysed to derive important insights and patterns related to the study's aims.

3.8.1. Profile of Participants

The study's participants were chosen for their leadership roles and experience relating to AI in HRM. Table 3.1 displays the profiles of the study's twelve participants.

Participants	**Position**
P1	HR Manager
P2	HR Manager
P3	HR Manager
P4	HR Manager
P5	HR Manager
P6	HR Practitioner
P7	HR Practitioner
P8	HR Practitioner
P9	HR Practitioner
P10	HR Practitioner
P11	HR Practitioner
P12	HR Practitioner

Table 3.1: Profile of Participants

3.9. Data Collection Methods

Adedoyin (2020:5) states, "Qualitative research is gathering and interpreting non-numerical data for understanding." Cresswell and Creswell (2018:180) state, "Researchers increasingly use a theoretical lens or perspective in qualitative research." Therefore, the research instrument employed is semi-structured interviews.

The qualitative method with a semi-structured approach will allow for further exploration of the impact of Artificial Intelligence in Human Resource Management in a manufacturing company in South Africa. Adams (2015:494) states, "Semi-structured interview employs a blend of closed- and open-ended questions, often accompanied by follow-up questions." Semi-structured interviews employ open and closed-ended questions, allowing for follow-through questions. This allowed the researcher to understand the AI perspective at the organisation and the opportunities and challenges associated with AI implementation, providing further direction for the organisation on adopting AI in HRM.

3.10. Interviews

Semi-structured interviews were used to obtain data. The interviews were performed via electronic MS Teams sessions and scheduled for 60 minutes per interview, with the meeting being transcribed. The interviews explored the participant's understanding and experiences of AI in HRM, perceived challenges and opportunities, and their understanding of the path AI will take in HRM. The open-ended questions encouraged participants to contribute their experiences and insights. From 5 September 2024 to 27 September 2022, twelve (12) semi-structured interviews were conducted, lasting an average of 40 minutes each. Permission to record the interview sessions was obtained from participants.

3.11. Data Quality

In order to guarantee the acquisition of trustworthy and legitimate data that successfully answers the research questions, data quality is essential in research (Saunders et al, 2019). To improve data quality and reliability for this study on the application of AI in HRM in a manufacturing context in Durban, several strategies were put in place, as below:

3.11.2. Credibility

Interview transcripts were returned to participants for validation and verification as part of a member screening procedure used to establish trustworthiness (Creswell and Poth, 2018). This ensured that the collected data appropriately reflected participants' opinions and experiences about using AI in HR procedures.

3.11.3. Transferability

To help readers decide if the results are transferable to similar situations, the manufacturing company's background, HR procedures, and AI installation were all described in-depth and in detail as guided by (Merriam and Tisdell, 2016). Participants with various positions and AI implementation experiences in HR were chosen through purposeful sampling.

3.11.4. Confirmability

To improve the study's confirmability and lessen the chance of bias during the data collecting and analysis stage, an audit trail was maintained and is accessible upon request.

3.11.5. Dependability

The researcher ensured that the study's design, data collection, analysis, and presentation were all completed correctly and following accepted research guidelines.

In ensuring these quality procedures, the study's conclusions about how AI affects HRM practices in the manufacturing industry were guaranteed to meet accepted qualitative research requirements and be reliable, transferable, and confirmable (Saunders et al., 2019).

3.12. Data Analysis

Thematic analysis was utilised to understand the data generated from interviews. The flexible thematic analysis approach (TA) gives the researcher multiple options for focusing on the data. With TA, it is acceptable to concentrate on assessing meaning throughout the whole dataset or to thoroughly investigate a single facet of a phenomenon Braun and Clarke (2012). The data was transcribed to discover emergent themes and patterns, with the researcher returning to the data to refine and find additional themes.

Thematic analysis was employed to analyse the interview data, following the six-phase approach outlined by Braun and Clarke (2012). This method is particularly valuable for its flexibility and ability to identify patterns of meaning across qualitative datasets (Nowell et al. 2017).

3.12.1. Data Familiarisation

Actively interacting with the data and taking preliminary notes about possible patterns and meanings are part of this phase Terry, et al. (2017). This stage is essential for gaining a thorough grasp of the extent and substance of the dataset.

3.12.2. Generate initial codes

In this stage, the dataset's intriguing features were methodically coded. According to King, 2004, codes are labels that highlight significant aspects of the data pertinent to the study topic of AI's influence on HRM. The data was coded for both latent (underlying) and semantic (explicit) aspects. The researcher employed Nvivo and descriptive coding to record participant-inspired and researcher-interpreted codes.

3.12.3. Theme Generation

In this stage, codes were sorted and compiled into possible themes about the application of AI in HRM. According to Vaismoradi et al. (2016), themes are more expansive meaning patterns supported by a primary organising idea. At this point, the researcher combined related categories and eliminated unnecessary ones to create the first level of themes.

3.12.4. Analysing potential themes

This is the process of combining related labels and eliminating unnecessary ones to refine the original themes. The initial level of themes was reevaluated for the study to ensure appropriateness and any necessary revisions and reorganisations were made.

3.12.5. Theme Finalisation

In this stage, topics were identified and given names. The core ideas of each theme was summarised, along with how they fit into the larger story of AI in HRM (Braun and Clarke, 2012). The final themes and sub-themes for the study were developed by rethinking candidate themes under the research questions.

3.12.5. Writing Up

The final phase involved producing a scholarly report of the analysis, selecting compelling extract examples and relating the analysis to the research question and literature (Braun et al., 2019).

3.13. Ethical Issues

To adhere to study ethics, a gatekeeper's letter and ethical approval were obtained before data collection. The researcher ensured a gatekeeper's letter was attained (see appendix D) from the Durban, South Africa manufacturing company, granting authorisation to engage the HR team in their experiences of AI in HRM.

The UKZN Humanities and Social Sciences Ethics Committee (HSSREC) provided ethical approval (see Appendix C) before data collection for this study. During data collection, participants received an informed consent form (see Appendix A) outlining the study's purpose and the option to withdraw from the study at any time. Participants gave consent to record interviews and were assured confidentiality. Participants' identities were represented using pseudonyms (e.g., Participants A, B, C) to ensure anonymity during data presentation and discussion.

3.14. Conclusion

This chapter described the research approach used to investigate the impact of artificial intelligence on human resource management at a Durban-based manufacturing company. Following an interpretive paradigm, the study took a qualitative method, conducting semi-structured interviews with twelve (12) HR experts chosen through purposive sampling. This methodology allowed detailed data concerning HR practitioners' experiences and viewpoints on AI implementation.

The research design followed a phenomenological framework, with data quality assured by various techniques such as member validation and the maintenance of an audit trail. Data was analysed

using Braun and Clarke's six-phase thematic analysis approach, which systematically discovered patterns in the obtained data. This methodological framework, combined with careful ethical considerations, provides a solid foundation for investigating the opportunities and challenges of AI in HRM in the South African manufacturing context, laying the groundwork for the presentation and discussion of findings in the subsequent chapter.

Chapter 4: Presentation of Findings

4.1. Introduction

The previous chapter discussed the research methodology, including strategies, processes, and techniques to achieve the study's goals. This chapter presents the findings from the thematic analysis of data collected through interviews with HR Managers and HR Practitioners. The study focused on the impact of Artificial Intelligence (AI) in Human Resource Management (HRM) in Durban, South Africa. The data was coded and analysed using NVIVO software, enabling the identification of significant themes and sub-themes that highlight the current impact of AI utilisation in Durban, South African HRM manufacturing practices.

4.2. Research Findings

The analyses of interview transcripts revealed 11 themes and 32 sub-themes. Table 4.1 summarises the themes and sub-themes that emerged from the data analysis.

Study Objectives	Main Themes	Sub Themes
Current State of AI Adoption	Application of AI in HRM globally	Global adoption more momentum Industry leaders driving adoption
	South Africa's AI in HR Adoption vs Global AI in HRM	Technological Gap Underdeveloped AI ImplementationSpecific AI applications in HRM
	AI current adoption in Durban, South Africa	Recruitment and Selection Administrative Tasks and Automation Unofficial or Individual Use
	Factors Influencing AI in Durban, South Africa	Adoption level and Readiness Organisational Factors Financial Considerations
Opportunities, Challenges and Ethical Considerations	Areas of AI Utilisation	Recruitment and Talent Acquisition Learning and Development Performance Management and Analytics
	Opportunities for AI Utilisation	Efficiency and Productivity Enhancement Improved Hiring and Recruitment Processes Enhanced Experience
	Consideration of Challenges	Accuracy and Reliability Legal and Regulatory Compliance Human Touch and Interaction
	Areas of Concern - Challenge	Job Security and Employee Resistance Cultural Sensitivity Transparency/Accountability and Trust
	Ethical Concerns	Data Privacy and Confidentiality Human Oversight and Verification Transparency and Disclosure
AI impact on HRM functions	HR Functions improvement through utilising AI	Recruitment and Selection Performance Management Learning and Development Employee Engagement
	Fostering a Progressive attitude towards AI adoption	Communication and Transparency Education and Training

Table 4.1: Study Themes and Sub-Themes

The first research objective was to investigate the existing state of AI adoption in human resource management (HRM) in South Africa's manufacturing sector. Participants were asked about AI adoption from a global and South African standpoint. The investigation revealed themes such as the types of AI applications, global AI applications, AI current adoption in Durban, South Africa, and factors influencing AI in Durban, South Africa, as depicted in Figure 4.2. below.

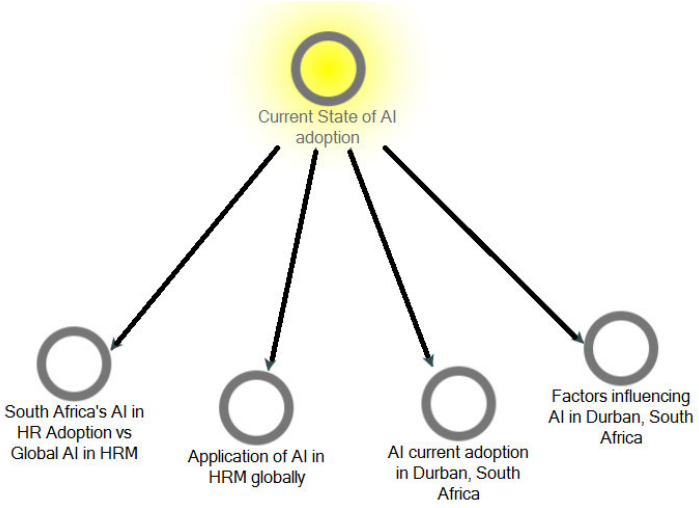

Figure 4.2 Theme: Current state of AI adoption

4.2.1.1 Application of AI in HRM Globally

The interviewer asked participants about the global deployment of AI in HRM to assess its impact and use. The interview analysis revealed sub-themes, as shown in Figures 4.3 to 4.7. Participants described global adoption as higher, driven by industry leaders, and varied by region and company size.

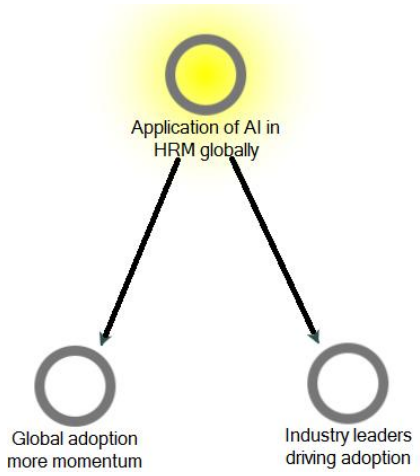

Figure 4.3 Sub-Theme: Application of AI in HRM globally

a) Global adoption more momentum

The research findings show a clear trend of global AI adoption in Human Resource Management (HRM). This momentum is visible in several participant responses:

"*There seems to be a greater source of application when it comes to using it as a tool in the recruitment space." (P1)*

"*Globally, from what I am aware of from having studied last year and interacted with a variety of different human resource professionals, there is an increasing trend to use AI in human resources" (P4)*

"From a global perspective, I think there is a lot of work being done." (P7)

This trend was further confirmed by P 8, noting that:

"*more and more companies are starting to adopt AI*,"

These findings suggest that AI is becoming an increasingly relevant and widely accepted technology in human resource management. The repetition of this issue among several participants emphasises the importance of this trend in the current status of AI adoption.

b) Industry Leaders Driving Adoption

According to the study, industry leaders and certain areas play an important role in furthering AI adoption in HRM.

"In the global markets, you will find that the likes of Toyota, of Coca-Cola, or the larger corporations are forging ahead." (P3)

"Globally, if you look for solutions, you will find a lot in the United States, that is where the technology starts. You will find a lot there, and they have got some interesting applications." (P5)

These findings suggest that while AI adoption in HRM is a global phenomenon, it is significantly shaped by the actions and experiences of major corporations and leading tech markets. This dynamic could lead to a 'trickle-down' effect, in which innovations and practices pioneered by these leaders gradually disseminate to South Africa and smaller organisations.

4.2.1.2. South Africa's AI in HR Adoption vs Global AI in HRM

To investigate South Africa's AI in HR adoption versus global AI in HRM. Interviews revealed that AI is underutilised in HRM. Other traits that were rarely discussed. Figure 4.4 illustrates the sub-themes identified throughout the analysis, further clarified by study participants in the following section.

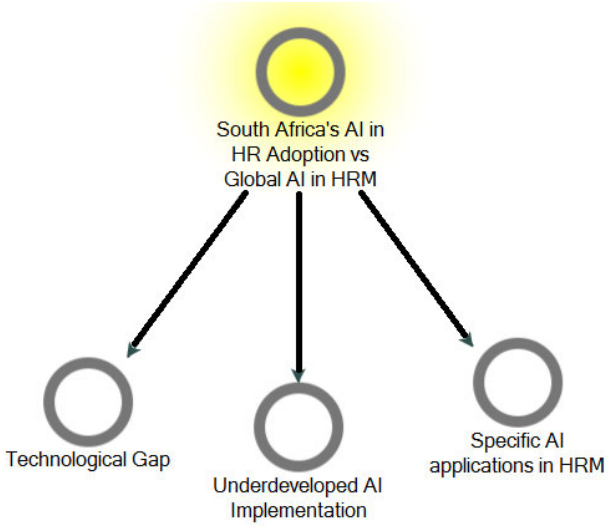

Figure 4.4. Sub-Theme: South Africa's AI in HRM Adoption vs Global AI in HRM

*a) **Technological Gap***

The investigation revealed a significant technology gap between South Africa and global leaders in AI adoption for human resource management. This gap identified by participants indicates that South African organisations are falling behind their worldwide competitors in integrating AI technologies into HR procedures.

"AI in HR suffice to say that from a South African context, we are behind the curve." (P1)

"We are still in the process of just catching up to the rest of the world, so we are just starting to adopt the AI." (P6)

However, it is important to note that this disparity may not be specific to South Africa, as one participant stated:

"*Globally, South Africa is not unique in how a global setting will onboard AI into their workplace, and the reason, from my experience, I find that the people I liaise with globally are a bit reluctant*

or resistant to technological advances in some industries, whereas in other industries, globally and in South Africa, they are very happy to take it on and to move forward with technology." (P10)

This illustrates that while there is a perceived lag in implementing AI in HRM in South Africa, it could be part of a more significant trend in developing economies, and the lag is limited to specific industries.

b) *Underdeveloped AI Implementation*

The interviews created a sub-theme about the underdeveloped condition of AI deployment in South African HRM. This theme implies that, even if AI is being used, its implementation may be less extensive or complex than in more mature sectors. Participants conveyed this sentiment in a variety of ways.

"*In South Africa, AI is not fully developed, but we are at the entry level where we're getting used to applying it to our day-to-day tasks. Some manufacturing companies have accepted or have a policy that it can be used in some areas." (P2)*

"*I think South African manufacturing is lagging. However, in the manufacturing sector, we need to compare apples with apples if you think of huge conglomerates like Toyota; for example, they are ahead." (P3)*

The participant feedback indicates that the underdevelopment of AI in HRM could be part of a more significant trend across sectors; however, manufacturing is not viewed as a leading sector regarding AI in HRM adoption. However, larger organisations have made positive strides towards AI implementation.

c) *Specific AI applications in HRM*

The investigation revealed a sub-theme focussing on specific AI applications utilised in South African HRM practices. While mentions of these applications were few, they provide insight into the areas where AI is gaining traction in manufacturing HR departments.

"*There is a variety of different new hiring tools that are available that use AI, AI initial interview tools that are also used*" *(P4)*

"Applicant tracking system is one of the tools integrating AI, which also screens CVs" (P9).

These references indicate that AI is primarily used in South African HRM for recruiting and candidate selection. This is consistent with global trends, in which recruitment procedures are frequently the first to see AI deployment due to the potential for increased efficiency in managing high volumes of applications seen in the manufacturing sector.

4.2.1.3. AI Current Adoption in Durban, South Africa

The interview objective was to ascertain the current adoption of AI in Durban, South Africa. The predominant sub-themes established are Recruitment and Selection, Administrative Tasks and Automation and Unofficial or Individual Use, as displayed in Figure 4.5.

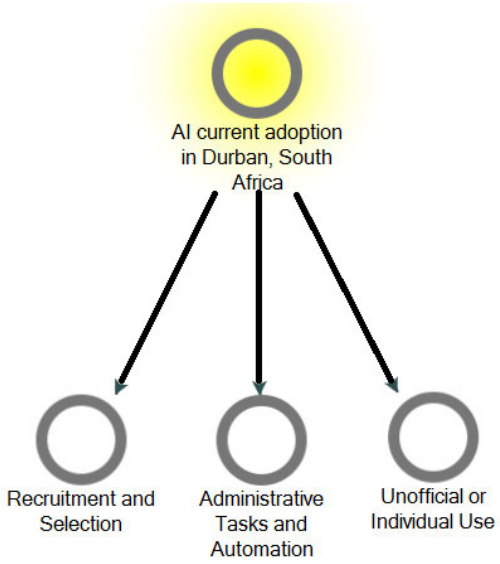

Figure 4.5. Sub-Theme: AI current adoption in Durban, South Africa

a) Recruitment and Selection

Using AI in recruitment and selection procedures emerged as a critical subject in the investigation. Participants reported varied degrees of AI integration.

"I use AI very frequently for recruitment". (P10)

"I use it to formulate a lot of my competency-based questions." (P12)

Furthermore, (*P5) "all the sites you have been using for recruitment have applied AI in the background to filter CVs."*

The above indicates the adoption of AI in manufacturing organisations in Durban, South Africa. Specifically related to the recruitment and selection process to develop competency-based interviews, digitise the recruitment application system, reduce recruitment administration, and streamline the process through CV filtering. This functionality frees up HR to focus on more critical areas of HR.

b) Administrative Task and Automation

The second key sub-theme was using AI in HRM for administrative duties and automation.

"We were paper-based, and now we have got WhatsApp bots which reduces time and administration." (P3)

"There is the HR admin part, which is very easy to apply AI applications to." (P5)

"You can easily draw reports and reduce admin instead of relying on an Excel spreadsheet, subject to human error. However, with automation, data is more accurate." (P8)

The transition from traditional to digital systems paves the way for increased AI integration across numerous HR processes. Participants emphasised the application of AI in HRM for administrative tasks and document analysis, such as policies, contracts, and personnel data. AI functionality also includes reporting capabilities, demonstrating that AI is used to analyse HR data more efficiently.

c) Unofficial or Individual Use

The unofficial or informal use of AI tools by Human Resources emerged as the third theme.

"Individuals unofficially use AI in executing their personal job responsibilities." (P1)

" Now I can go to ChatGPT and type that in, and I've got the answer." (P5)

"AI does increase your productivity in that instead of physically analysing two documents or two sets of tables with data, you can copy and paste that into whatever platform you are using, and it takes a few seconds to draw that analysis. It can be very, very, very productive." (P12)

The above indicates the acceptance of AI technology, even in organisations that have yet to formally integrate AI into their HR procedures. This suggests that HR professionals use AI for speedy issue-solving and information retrieval in their regular work. It also highlights how AI helps HR professionals stay current on industry trends and best practices. This indicates that AI applications have both official and informal uses within organisations.

4.2.1.4. Factors Influencing AI in Durban, South Africa

The interview objective was to ascertain the Factors Influencing AI in Durban, South Africa. The theme reflected factors that are either hindering or progressing the advancement of AI in manufacturing in Durban, South Africa; the predominant themes established are reflected in Figure 4.6.

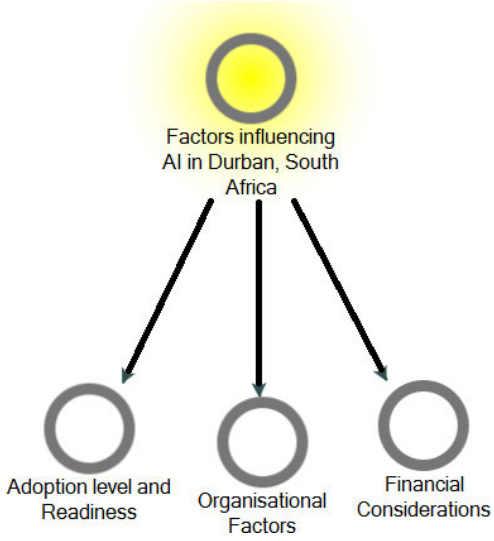

Figure 4.6. Sub-Theme: Factors influencing AI in Durban, South Africa

a) Adoption level and Readiness

The adoption and readiness of AI in manufacturing in Durban, South Africa, plays a vital role in the overall implementation of AI in adoption as it serves as the foundation for organisations to build their AI capabilities. Participants indicated the adoption level and readiness as below:

" We are still at the entry-level." (P2)

"In South Africa and the manufacturing sector, there seems to be quite a lot of hesitation to utilise AI. " (P4)

"General digital literacy lacking we are still learning and developing." (P9)

This above feedback demonstrates that many organisations are still in the early implementation phases and face the challenge of hesitation and digital literacy.

b) Organisational Factors

Participants highlighted the theme of organisational factors in that the adoption varies based on the organisation. As explored below, organisations with more resources, capabilities, and finances can further their AI innovation capabilities, which poses a challenge to smaller organisations with fewer resource capabilities.

"Business or organisation specific, so it would depend on how information savvy or what kind of information we want or want to see from our information. That will dictate the business case, for AI, in manufacturing, there is a lot of data that needs to be analysed, therefore indicating the need for AI tools." (P12)

"Small businesses compare differently to huge conglomerates like Toyota, for example." (P3)

The above reflects the impact of the size of organisations and the resources available at their disposal to successfully further AI implementation. As explored in 4.2. global adoption also plays a role in multinational corporations' ability to transfer technologies to their South African sites, as investment, research, and testing have already been made in countries with a higher adoption level. The positives of this technology transfer may serve as an extension to smaller businesses that can take the learnings of larger organisations and implement them in their organisation.

c) Financial Considerations

This theme covered the financial elements of using AI in HRM, including expenses and possible cost-effectiveness compared to traditional techniques.

"I have also found that the financial resources are limited to implement AI to its fullest use. New products and the new offerings are under licence, so there are costs involved and from what I've seen on the South African side." (P4)

"AI does not seem to cost an arm and a leg as opposed to getting a programmer." (P3)

As discussed in point B above, an organisation's resources influence how the organisation adapts to AI tools. A resource required of an organisation to implement AI in HRM is finance. As

mentioned above, the participants indicated that financial resources play a role in the financial requirements to purchase software and hardware, and further costs could be attributed to the maintenance and updating of the technology. However, to the contrary, P 3 highlights a cost saving in that AI will be cheaper to use, citing an example that instead of hiring a programmer to address an organisation's IT needs, the organisation can utilise AI to meet that need.

4.2.2. Opportunities, Challenges and Ethical Considerations

The second research objective was to identify the opportunities, challenges and ethical considerations experienced by HR Managers and HR Practitioners in a manufacturing company in Durban, South Africa. Participants were asked about the opportunities, challenges and ethical considerations related to AI in HRM to achieve this research objective. The themes that emerged from the analysis of the interview responses are illustrated in Figure 4.7. below.

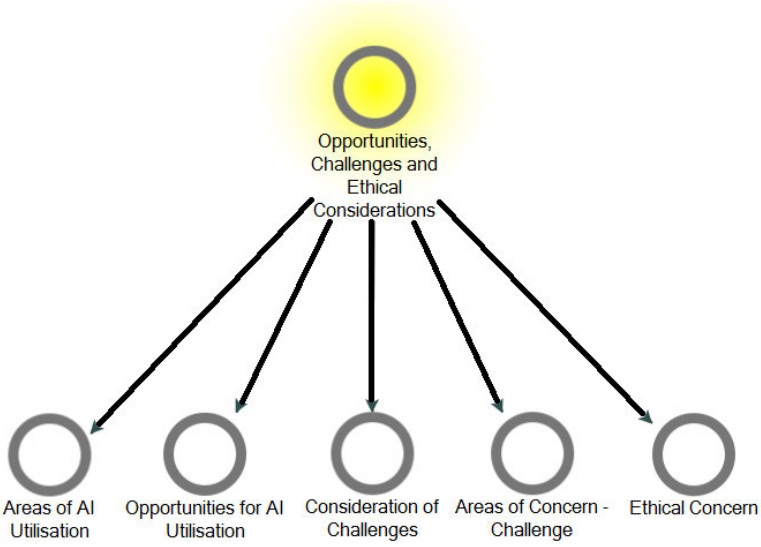

Figure 4.7. Theme: Opportunities, Challenges and Ethical Considerations

4.2.2.1. Opportunities for AI Utilisation

One of the study objectives was to establish AI opportunities in HRM. This resulted in the creation of two sub-themes: firstly, the opportunities of AI HRM, and secondly, the sub-theme of areas of AI utilisation. From the interviews, the participants attributed the overall opportunities of AI in

HRM as efficiency and productivity enhancement, improved hiring and recruitment process and enhanced employee experience, as per Figure 4.8.:

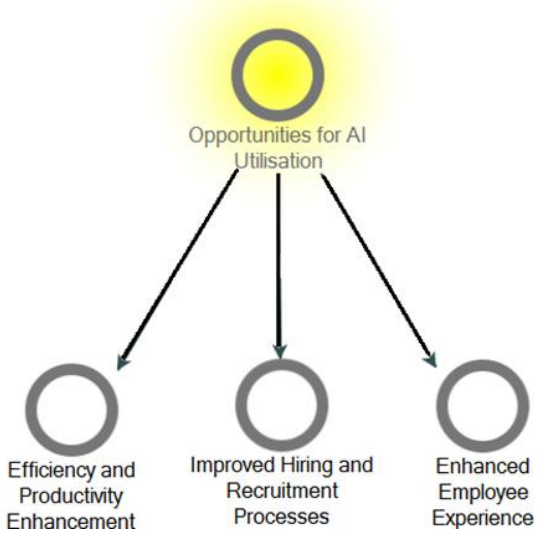

Figure 4.8. Sub-Theme: Opportunities for AI utilisation

a) Efficiency and Productivity Enhancement

Participants identified a few opportunities for efficiency and productivity enhancement for utilising AI in HRM, which were related to timesaving, efficiencies, streamlining and overall contribution to productivity.

"AI does increase your productivity and time efficiency." (P12)

"AI can enhance the efficiency and improve the decision making." (P2)

"Automation can integrate AI into any industry however, it has specific benefits for manufacturing." (P11)

"I think an opportunity would be a convenience." (P3)

The opportunities of using AI in HRM from the participants presented itself as an effective efficiency and productivity tool, creating opportunities for the HR department to deal with other matters of higher importance.

b) Improved Hiring and Recruitment Processes

A sub-theme that emerged from research objective one is AI's predominant influence in recruitment and selection. Participants presented the current use of AI and the potential opportunities of AI in recruitment and selection as below:

"AI can help us streamline our hiring processes, screening of CVs and matching the candidates to the job descriptions." (P2)

"AI can be used to shortlist candidates and go so far as to make recommendations from that shortlist based on the job description or the job specs provided. I think that is quite an impactful use of AI within the HR setting and from a recruitment perspective." (P1)

"I can use AI as a simple process in the recruitment process where we now are relying more on AI to screen the candidates and assist in generating a job description." (P8)

c) Enhanced Employee Experience

Participants highlighted the overall utilisation of AI in HRM as an impact on improving the overall employee experience by creating opportunities such as personalised and improved insights that would contribute to an enhanced employee experience:

"Work towards bettering systems, bettering the experiences of the staff and the company." (P 3)

"The integration of AI can enhance efficiency, improve the decision making, and create a personalised employee experience amongst various departments or industries, leading to the significant advancement of the current workspace." (P2)

Participants emphasised how AI's capacity to deliver personalised insights and enhance systems helps to create a more efficient and engaging workplace. This technology breakthrough accelerates HR operations and allows for more informed decision-making across departments and industries. Organisations may promote a more productive workplace by employing AI to understand better and respond to employee needs, resulting in innovations in the modern workspace that benefit both employees and the company.

4.2.2.2. Areas of Utilisation

The sub-theme of areas of utilisation emerged from the theme of opportunities. This sub-theme identified functional areas of HR that would benefit from AI in HRM. Participants shared an understanding and relevant description of the applications that can be utilised and the further implications that create opportunities for these applications. As per Figure 4.9. the participant's responses to these sub-themes were further explored.

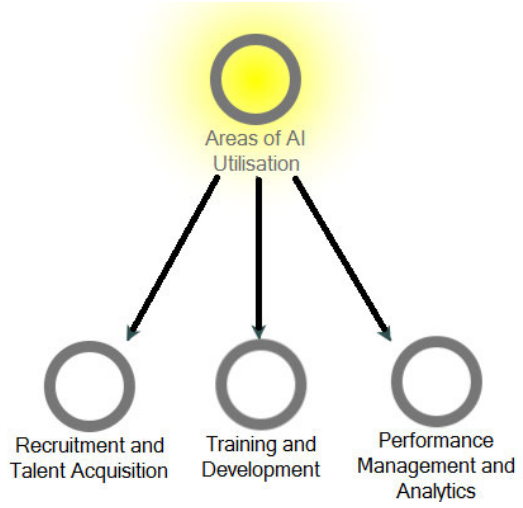

Figure 4.9. Sub-Themes: Areas of utilisation

a) Recruitment and Talent Acquisition

The frequent areas of AI use in HR were recruitment and talent acquisition, with referrals from multiple individuals. This theme covered several parts of the recruiting process in which AI is used or considered for use.

"Experienced HR professionals know that recruitment can sometimes be very time-consuming and labour-intensive, and I have seen examples of how AI can be used to shortlist candidates and go so far as making recommendations from that shortlist based on the job description or the job spec." (P1)

"We can use it for screening and doing skills tests, locally and internationally. That is where the power of AI has been felt. It is moving away from somebody sitting with a potential candidate,

doing an interview, and deciding, based on the emotional feeling towards that person, whether the person would be good or bad for the position. AI can perform these skills tests. " (P4)

According to the participants, AI is being utilised for initial candidate screening, preliminary interviews and skill assessments, which could lead to a more standardised and efficient evaluation process. It also suggests that AI is being utilised to understand candidate characteristics better and optimise the overall recruitment approach.

b) Training and Development

The second most common theme was using AI in training and development, with multiple participant referrals.

"An area where it is very resource-intensive to do correctly is talent management or skills development. If you wanted to do it properly, you needed people to spend a lot of time on it. It is the same with on-the-job training, learning, development, curriculum development, all those things. So those types of things definitely can be automated." (P5)

"I think there is still an opportunity for manufacturing companies to adopt virtual training. So, instead of having 30 newbies, as there are normally many recruits, you can have them online virtually." (P8)

"Online learning assessments test all the things that you need for your good manufacturing practice. You can automate a lot of those." (P5)

"Massive opportunities in terms of the design of learning and development material." (P1)

Participants emphasised AI's potential to offer individualised training experiences. The participants also indicated that AI can be considered for integration into employee development, from on-the-job training and training plans to curriculum design.

c) Performance Management and Analytics

The third sub-theme that emerged was using AI in performance management and analytics, revealing that AI is being used to continuously evaluate employee performance and provide early warnings for potential non-performance. Participants further highlighted the analytics and benefits thereof that AI would bring:

"*Performance management system flagging for performance and supporting HR with that function." (P11)*

"HR reporting dashboard perspective, I think there are opportunities there as well for AI." (P1)

"Culture insights in terms of employees, sentiments of how they are feeling in their workplace, we slowly also adopting the use of AI." (P8)

4.2.2.3. Consideration of Challenges

The consideration of challenges represents the broader factors that negatively impact HR functions, from ensuring a smooth transition of AI implementation. The challenges identified by participants are accuracy, reliability, and legal and regulatory compliance. These challenges are illustrated in Figure 4.10. below.

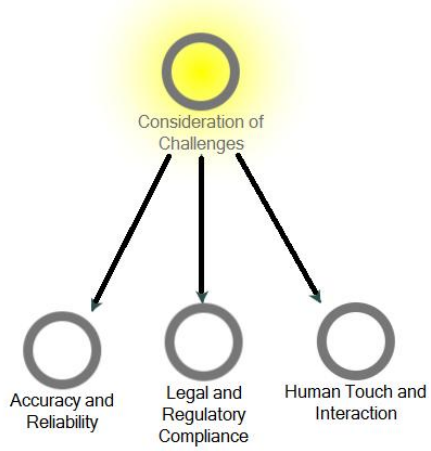

Figure 4.10. Sub-Theme: Consideration of Challenges

a) Accuracy and Reliability

The sub-theme emerged from participants indicating that AI was utilised. However, the need to check reliability and accuracy was imperative, as indicated below:

"AI is not 100% accurate? So, if you have someone who does not understand the ethical use of AI and pops something in and takes out exactly what it says, it may be an opinion and not a fact. Then, you might be at risk of putting out incorrect information." (P10)

"AI is not 100% accurate, so my view from an AI perspective is that AI is great and needed. We all still use it. But I think the experience and the people aspect is still needed at this stage to support it." (P11)

Multiple participants expressed concerns about the accuracy of AI systems. This perception of AI's limitations concerns HR professionals and indicates caution in fully embracing AI technologies.

b) Legal and Regulatory Compliance

A concern within this sub-theme relates to legal and regulatory compliance. Compliance with data protection rules is a primary consideration for this theme. Participants notably cited the Protection of Personal Information Act (POPIA or POPI Act) in South Africa.

"The POPI Act and all the other legislation, from a wider confidentiality perspective, adds an additional layer of complexity when using AI within the HR space because of the confidentiality of employee information." (P1)

"Organisations or the companies must ensure compliance with the data protection regulations such as the POPI Act." (P2)

"I think they may be concerned about what this AI is and how invasive it is. And then POPI Act drives the concerns in terms of what we allow AI access to and when it breaches the POPI Act." (P7)

Participants shared concerns about more considerable legal consequences and specific data protection legislation:

"data protection regulations, regulatory compliance, legal implications of using AI in the HR sphere can be complex" (P2)

These statements illustrate the legal complexities surrounding AI deployment in HR and the importance of carefully considering and adhering to numerous regulatory obligations.

c) Human Touch and Interaction

The final sub-theme is the significance of keeping the human touch and engagement in HR procedures, even as AI is introduced. This sub-theme appeared to be even more relevant to the specific nature of the Durban, South Africa manufacturing industry as employers and employees still prefer face-to-face intervention instead of virtual meetings; therefore, this will be further impacted by the reduction of human interaction by leveraging AI.

"Everything can be automated, understandably so, but I still believe that you need the human thinking behind it, and you do need that people aspects. I think just in terms of my career experience, the challenge would be the lack of the people interaction with the people thinking behind it." (P11)

"There is also a risk of that human factor missing in the process. So, we need to find a balance when we use AI however not completely doing away with the human factor." (P8)

Some participants indicated that AI should be used as a tool to enhance and enable human resource professionals in their roles rather than as an entire replacement for the human element:

"AI should be of a facilitating tool rather than a complete tool." (P3)

These opinions suggest a preference for incorporating AI in HR in a way that complements rather than replaces human expertise.

4.2.2.4. Areas of Concern – Challenge

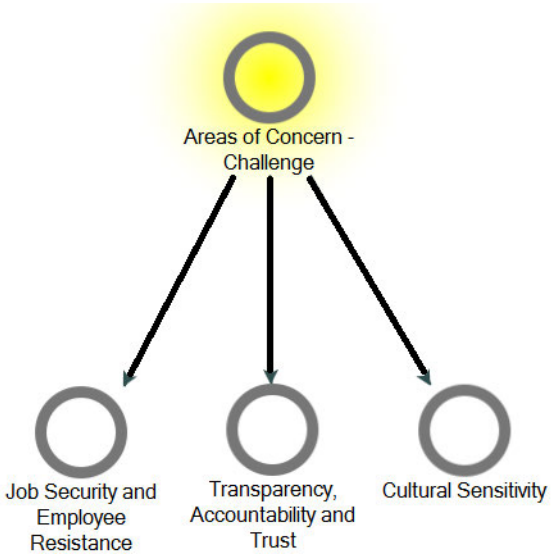

Figure 4.11. Sub-Theme: Areas of concern – Challenge

a) Job Security and Employee Resistance

One of the most significant themes emerging from participants was employee anxiety about job security; it is important to note that the fears of job security were not related to the participants but from a general employee perspective. The above-mentioned factors further lead to resistance in AI implementation in human resources.

"some people might feel threatened by AI because they might feel that their jobs are not secure." (P10)

"Losing their job security or they can be sceptical about new technology." (P2)

Participants' responses, closely related to job security concerns, show that employees are highly resistant to AI integration in HR operations. This resistance manifests in numerous ways:

"sceptical about new technology." (P2)

"people stick to what they know." (P3)

"As humans, we tend to be suspect of all new technology." (P4)

b) Transparency, Accountability and Trust:

A further theme was the challenges of transparency and confidence in AI systems in HR settings.

"The lack of transparency, AI is making it difficult to understand how decisions are made unless you have the time to go and dig and dig for clarity." (P2)

Findings show that the challenge of fostering trust in AI technologies is evident:

"It will be better, but to get the actual buy-in, there is a challenge because people stick to what they know." (P3)

One participant observed a general reluctance/wariness to use AI technology:

" As humans, we tend to be suspect of all new technology, and unfortunately, in AI, we might find that we are being told that this is the solution, and it is counterintuitive to what we think." (P4)

This above indicates that for AI to be successfully integrated into HR practices, there needs to be a concerted effort to build trust, accountability and transparency to ensure user and overall acceptance.

c) Cultural Sensitivity

Participants expressed concerns about how AI might affect existing organisational cultures, specifically those related to the diverse cultures and traditions, accents, and languages of South Africa, which requires perspective.

"AI can affect culture, so it must be culture-sensitive. Using the information or the input generated from the culture might lead to potential misunderstanding or misalignment with our local practices and values." (P2).

"It struggles particularly with our language vernacular and how we say things. I think AI also is not culture aware." (P7).

The above findings emphasise three interconnected areas of concern when implementing AI in HR: job security and employee resistance, cultural sensitivity, and transparency and trust. These topics highlight organisations' complicated hurdles when integrating AI into their HR operations.

4.2.2.5. Ethical Concerns

The sub-themes represent the expressed ethical concerns of participants. The approach emphasised the significance of privacy, human oversight, transparency, and disclosure when applying AI in HRM.

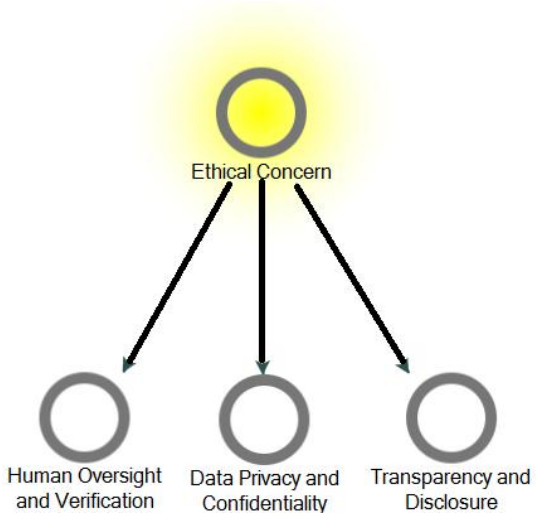

Figure 4.12. Sub-Theme: Ethical Concerns

a) Human Oversight and Verification

This sub-theme emerged from the participant's concern that human interaction is critical when introducing and implementing AI in HRM; this ethical concern is furthered by the field of human resources, where human interface is required to authentically further people-related matters. The second and more predominant aspect emerging from the theme is AI accuracy, which may provide incorrect information, requiring an expert in the field to ratify and confirm the information provided.

Human Oversight is still needed not only to interact and create trust with the workforce but also to review information from AI and ensure an ethical approach. (P6)

"I tested a few thoughts on ChatGPT and other AI systems, and the results were completely different from the legislation. It is where accuracy comes in; everybody feeds information into this

platform that is not validated. So, it is just giving you the best it can from the available resources. I mean, yes, it could be 80% correct, but there is still the 20% that I feel is inaccurate; therefore, there is a need for people's oversight to guide through expertise.'(P11)

"I acknowledge that I used AI to produce work and reports but ensured that I ratified the contents." (P7)

The findings emphasise the importance of human oversight for two key reasons: sustaining authentic human connections in people-related matters and assuring the correctness and ethical use of AI-generated information through expert evaluation.

b) Data Privacy and Confidentiality

Participants indicated privacy and confidentiality as areas of concern regarding AI in HRM. The sensitive nature of employee information, storage and the responsible use of information were highlighted.

"*A surety of confidentiality. Those types of things to create a more positive environment for leaders to adopt AI in our workplaces." (P1)*

"Do not infringe on people's privacy, keep everything confidential, and just be sensitive regarding different aspects, especially in HR." (P3)

c) Transparency and Disclosure

Participants emphasised the importance of organisations and individuals being open about using artificial intelligence. A participant emphasised:

"The business or individual needs to be very open and honest with AI usage." (P10)

The importance of clear communication about AI usage was further emphasised:

"AI usage must be communicated with employees." (P2)

"Informed consent must be ensured for the data usage." (P2)

This suggests that organisations should report their AI usage and educate employees about its ramifications and the benefits it offers.

4.2.3. AI's Impact on HRM Functions

The final research objective was to determine AI's impact on HRM functions, enabling HR professionals to facilitate the transition to AI and determining which functions within AI would be most affected, guiding the approach to AI integration. To achieve this objective, participants were asked about the functions currently impacted and which could be impacted in the future. The participants were also asked how buy-in amongst HR professionals and business leaders could be positively influenced. Two sub-themes emerged from analysing participants' responses: HR Functions improvement through utilising AI and Fostering a positive attitude towards AI adoption, illustrated in Figure 4.13. below.

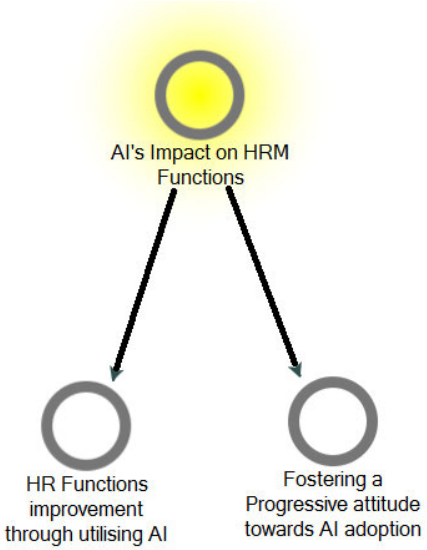

Figure: 4.13. Theme: AI's impact on HRM functions

4.2.3.1. HR Functions Improvement Through Utilising AI

The investigation identified three significant areas where AI is viewed as having a substantial impact on HRM. The reported sub-themes are derived from the interviews, which are Recruitment and Selection, Performance Management, Learning and Development and Employee Engagement:

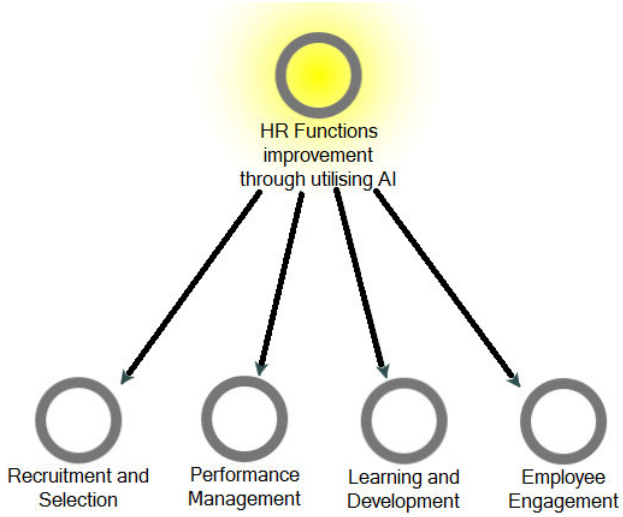

Figure 4.14. Sub-Theme: HR functions improvement through AI utilisation

a) Recruitment and Selection

Recruitment and Selection was a dominant sub-theme emerging across the examined interviews. This shows that HR professionals and organisations believe AI will substantially impact hiring.

> *"AI can streamline the recruitment process, particularly in screening and shortlisting candidates." (P11)*

> *"Automated candidate tracking systems (ATS) can improve the efficiency of the recruitment process." (P7)*

> Participants also referred to AI playing a further role than screening CVs:

> *"AI-powered chatbots can be utilised in the initial stages of candidate interaction." (P10)*

"I think there is a huge amount of opportunities when it comes to modelling and redesigning job descriptions and looking at the kind of people who would be successful in a particular role." (P4)

b) Performance Management

Performance Management was the second sub-theme that emerged. This demonstrates a strong belief that AI can improve organisations' management of and evaluation of employee performance.

"AI can analyse employee performance data and provide insights for managers." (P1)

AI tools can help identify high performers, underperformers, and employees with high potential." (P11)

"AI can assist in setting and tracking Key Performance Indicators (KPIs)." (P6)

P5 mentioned that AI can "*succinctly put people's KPIs in place and review those*," suggesting that AI can establish and monitor performance metrics.

c) Learning and Development

Learning and Development emerged as a frequent theme, demonstrating a rising acknowledgement of AI's ability to revolutionise how businesses approach staff training and skill development.

"AI can enable personalised learning experiences based on individual employee needs and preferences." (P1)

"AI content creation and some other technological advancements have huge opportunities. We now have immersive learning, virtual reality, and AI, which can assist in creating engaging content. So, there is a huge opportunity for creating on-demand training materials" (P4)

"Immersive learning experiences, possibly utilising virtual reality, can be enhanced by AI." (P5)

d) Employee Engagement

The emergence of employee engagement as a sub-theme suggests that organisations are increasingly reviewing AI to help foster a more engaged workforce.

"Concerning employee engagement, AI can help us design personalised engagement initiatives." (P2)

"I always needed engagement surveys, and I used AI to pull out the key aspects to report on and build off. It saved me a pile of time". (P7)

"Sentiment analysis tools can provide insights into employee morale and satisfaction." (P6)

The above highlights the potential for AI to tailor engagement strategies to individual employees.

4.2.3.2. Fostering a Progressive Attitude Towards AI Adoption

The objective was to understand the factors that would create a progressive mindset for HR professionals and business leaders to adopt AI in the manufacturing organisation. As the focus in a manufacturing environment is more from an operations or production perspective therefore investment priority would be those areas, the objective is to understand what the mindset shift required to create investment in AI for HRM. The sub-themes that emerged are as per Figure 4.15.

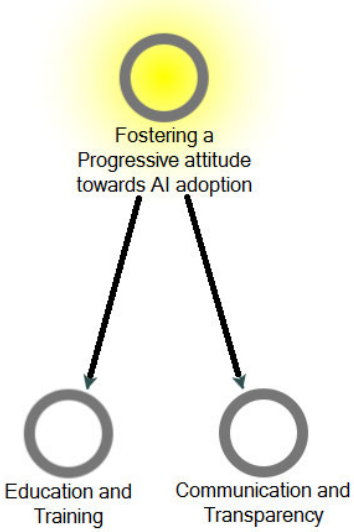

Table 4.15. Sub-Theme: Fostering a progressive attitude toward AI adoption

a) Communication and Transparency

Communication and Transparency are featured as a sub-theme. The participant's sentiment was that this allows for the opportunities and challenges to be effectively and transparently communicated to the relevant stakeholders to make informed decisions about AI benefits by understanding the benefits and risks associated with the investment of AI in HRM:

"I think transparent communication. If you maintain open lines of communication about AI initiatives can address the potential concerns and highlight the positive impacts. Transparent communication, such as keeping open lines of communication about AI." (P2)"

I think a strategy that could be used to encourage AI adoption is to highlight the wins and the benefits of what it can do. It is going to save you time, money, etc." (P3)

b) Education and Training

Participants in the study indicated that it was essential for the relevant stakeholders to be technologically knowledgeable about AI. Participants explained that HR and Business Leaders must improve their digital competency, particularly in understanding AI tools in HRM. Furthermore, some of the participants said:

"*As leadership in the organisation, if we want our people in the organisation to be comfortable with AI, we need to give them training." (P10)*

"Providing information and knowledge on what AI can be used for, further providing training or workshops. Understanding what the actual need is before jumping into any AI tool. Creating awareness of what it can be used for and encouraging its use." (P12)

4.3. Conclusion

The chapter presented the results of interviews with HR experts in a manufacturing business in Durban, South Africa, which addressed the study's objectives of researching the impact of artificial intelligence on human resource management. The investigation indicated that AI adoption in HRM is still in its early stages, with applications mainly in recruitment, administrative, and some informal individual use. While participants saw various opportunities for AI to improve efficiency, recruiting procedures, and employee experiences, they also cited limitations such as accuracy, regulatory compliance, and retaining the human touch in HR processes. Ethical considerations, particularly data privacy and transparency, emerged as central themes.

The findings provide valuable insights into the existing environment of AI in human resource management within the manufacturing sector in Durban, South Africa, demonstrating both the potential for AI to alter HR practices and the hurdles that must be overcome for its deployment. Participants emphasised the value of open communication and education in cultivating a proactive attitude towards AI adoption among HR professionals and business leaders. The next chapter presents a discussion of the study findings.

Chapter Five: Discussion of Findings

5.1. Introduction

The preceding chapter reported the results of the data analysis method. This chapter discusses the study's findings. The discussion refers to existing literature that supports the study findings. This chapter follows the same format as Chapter 4 regarding the main themes and sub-themes created while addressing the study's objectives. This chapter includes a thorough overview of the research findings reported in Chapter 4, which examines the impact of Artificial Intelligence (AI) on Human Resource Management (HRM) in a manufacturing company in Durban, South Africa. The discussion focuses on the study's research objectives and interprets the findings considering current literature and theoretical frameworks.

5.2. Research Objective One: Current State of AI Adoption in HRM

The findings show a considerable difference in HRM's worldwide and local AI usage. While worldwide markets show significant momentum in AI implementation, fuelled mainly by industry leaders, South African manufacturing enterprises, notably in Durban, take a more cautious and conservative approach to AI adoption. As per Rensburg et al.(2019), there is growing interest in AI-driven HR solutions. However, many South African organisations still grapple with the essential digitalisation of HR processes. This technology divide is consistent with prior findings showing that South Africa, specific to Durban's manufacturing sector, is behind in technological growth. The analysis finds that South African organisations must catch up to their global counterparts regarding AI adoption, with deployment mostly at rudimentary levels.

However, this pattern varies significantly depending on organisational factors, with larger manufacturing organisations, particularly those with a global presence, adopting more advanced AI than their smaller, local equivalents. This relationship between organisational resources and AI implementation skills indicates that access to finance, technical talent, and infrastructure is critical in defining the depth and breadth of AI adoption in HRM practices.

5.2.1. Current Applications in the Durban Manufacturing Sector

The study of AI deployment in Durban's manufacturing sector indicates a new but growing environment of technological acceptance with three major application areas. This section investigates each implementation domain and explores the consequences for the larger manufacturing ecosystem.

5.2.1. Recruitment and Selection as a Formalised HRM Application

The most visible and systematic application of AI technologies occurs in human resource management, notably in recruitment and selection processes. This finding is consistent with the fourth industrial revolution underway. A new tug-of-war has begun between enterprises, organisations, and industries competing in the labour market for the most suitable, skilled, and energetic people in the age of technological developments. This was highlighted by Oswal et al. (2020) who also noted that recruitment and selection of HR services frequently serve as early adopters of AI technologies. The use of AI for CV filtering and screening reflects a strategic move towards data-driven decision-making in personnel selection, which has the potential to reduce human bias and increase hiring efficiency.

The creation of competency-based questions using AI systems indicates a shift towards standardisation in recruitment methods. This standardisation may improve the objectivity of candidate evaluations while maintaining uniformity between hiring cycles. However, this method raises concerns about automated systems' possible shortcomings in capturing nuanced aspects of candidate fitness, especially in a field where technical proficiency must frequently be matched with soft skills and cultural fit. Therefore, as Lahiri and Schwartz (2018) highlighted, HR professionals must modify their recruitment tactics to attract applicants with the appropriate combination of technical and soft skills.

5.2.2. Operational Process Automation

The second central area of AI adoption is administrative duties and automation, which represents a practical method to increase operational efficiency. As mentioned by a participant, the use of WhatsApp bots for communication demonstrates an intriguing adaption of social network technology for manufacturing applications, implying a preference for familiar platforms over specialised and one-size-fits-all systems. Siocon (2024) emphasises that as technology evolves, we can expect even more advanced and effective chatbots to improve HR functions and employee experience.

Automated reporting systems are focused on decreasing manual administrative burden, potentially boosting data accuracy and decision-making speed. This finding is consistent with that of Charlier and Kloppenburg (2017), who recognised that AI would bring greater time, capability, budget space, and better data.

Participants highlighted document, analysis and processing capabilities, which appear to be gaining traction, but the extent to which they are integrated with crucial production processes warrants further examination. This finding is consistent with Sanyaolu and Atsaboghena's (2022) research, which introduces Machine learning (ML) as a technique that can help evaluate large amounts of data and identify patterns the organisation has yet to discover.

5.2.3. Individual Innovation and Adoption

Perhaps the most striking discovery is the rise in unofficial individual use of AI technologies, showing a bottom-up approach to technological adoption. This phenomenon indicates that staff actively pursue technological solutions to improve productivity and efficiency, even without explicit organisational initiatives. The participants identified Generative Intelligence AI as the tool predominantly used by staff. This is highlighted by Brown's (2023) research finding that generative tools such as ChatGPT, Midjourney, and DALL-E have demonstrated the ability to engage in human-like interactions and solve complex problems.

In the ever-changing environment of human resources (HR), generative AI has emerged as a valuable tool (Vishwanath & Vaddepalli, 2023). Individual employees' usage of personal productivity tools and information retrieval systems reflects an organic progression in workplace practices. This bottom-up adoption trend may be a valuable predictor of future organisational needs and chances for formal AI deployment. However, it poses fundamental concerns about data security, standardisation, and the necessity for consistent organisational norms controlling AI tool use.

These findings indicate that AI adoption in Durban's manufacturing sector is taking a mixed approach, combining formal organisational initiatives with grassroots innovation. This dual strategy may have distinct advantages, allowing organisations to benefit from controlled implementation tactics and employee-driven innovation. The findings also emphasise the need for more formal AI governance methods that preserve individual users' innovative spirit.

5.3. Research Objective Two: Opportunities, Challenges and Ethical Consideration

5.3.1. Opportunities

The opportunity of AI in HRM study objective raised two themes: Areas of AI Utilisation and Opportunities for AI Utilisation. From these themes, six sub-themes emerged: Efficiency and Productivity Enhancement, Improved Hiring and Recruitment Processes, Enhanced Experience, Recruitment and Talent Acquisition, Training and Development, Performance Management and Analytics. All sub-themes will be discussed below except Training and Development and Performance Management, as these functional areas will be discussed in detail in the third research objective; the discussion of findings will be detailed when addressing study objective three. These opportunities demonstrate the potential for AI to transform traditional HR practices and enhance operational efficiency, which will be further discussed below:

5.3.1.1. Efficiency and Productivity Enhancement

The research findings highlighted efficiency and productivity improvement as a key possibility. Several participants emphasised AI's capacity to dramatically cut time spent on everyday routine tasks. Jia et al. (2018) highlight that recent research has shown that AI has had a beneficial impact on the field of HR. Vivek and Yawalka (2019) also found that AI can help reduce burden and improve workplace efficiency.

5.3.1.2. Improvement of Hiring and Recruitment

Participants repeatedly identified AI's potential for streamlining the recruitment process, from initial screening to final selection. It was also highlighted that AI can streamline hiring processes, notably CV screening and candidate-job matching. This conclusion is especially pertinent for manufacturing organisations, which frequently conduct large-scale recruitment campaigns. Participants indicated a shift towards more data-driven and objective recruitment techniques, which may reduce human bias in the selection process. The above is aligned with literature as Sanyaolu and Atsaboghena's (2022) research indicated that AI can be used to automate repetitive operations after first analysing enormous amounts of data to identify trends, speeding up the hiring process, which is also supported by Oswal et al.'s (2020) research indicating that AI enables HR managers to make more effective recruitment decisions based on intelligent data. Merwe and Jacobs's (2023) study illustrated how machine learning can complement recruitment using algorithms that can forecast future workforce needs by analysing historical data, market trends, and economic indicators.

5.3.1.3. Enhanced Experience

The improvement of the employment experience appeared as a transformative possibility. The findings suggested that AI has the potential to build a more personalised and responsive HR environment. Participants' observations reflected that AI could "create a personalised employee

experience amongst various departments", indicating a shift towards more personalised HR service delivery. AI can optimise shift schedules based on individual preferences, talents, and productivity patterns, potentially leading to enhanced work-life balance and higher engagement (McKinsey, 2021). Hashim's (2024) research indicates that AI is helping companies provide a more immersive employee experience in various ways. This is especially important in the manufacturing sector, where standardised HR methods have long been the norm. The capacity to create personalised experiences while preserving operational efficiency is a significant development in human resource management approaches.

5.3.2. Challenges

This theme highlights the participants' feedback on the challenges and concerns associated with AI adoption in HR functions within the manufacturing sector in Durban. The investigation reveals six sub-themes highlighting possible organisational challenges when implementing AI into their HR operations.

5.3.2.1. Accuracy and Reliability Concerns

The findings reveal concern among HR professionals regarding the accuracy and reliability of AI systems. Participants consistently emphasised that AI offers valuable capabilities, but its outputs cannot be accepted without human verification. This aligns with previous research by Sanyaolu and Atsaboghena (2022). AI can enhance business solutions but cannot replace human managers in certain tasks. It was found that AI systems, despite their sophistication, still require human oversight to ensure accuracy.

The participants' emphasis on AI not being "100% accurate" reflects a realistic understanding of AI's current limitations. The importance of the human and machine interface is highlighted by Wisetsri et al. (2022), who stated that creating a balance between man and machine is required to adopt AI in HRM processes effectively. This finding suggests organisations should adopt a hybrid approach where AI augments rather than replaces human decision-making in HR processes. The

need for human verification also indicates that successful AI implementation requires staff with technical competency and critical thinking skills to evaluate AI outputs effectively.

5.3.2.2. Legal and Regulatory Compliance

Compliance with data privacy legislation, particularly South Africa's Privacy of Personal Information Act (POPIA), is a significant concern the research raises. The findings from participants reflect that HR professionals know the legal ramifications of using AI to process sensitive employee information.

The intricacy of guaranteeing compliance while harnessing AI's capabilities poses a considerable challenge to organisations. Participants replies indicate that the legal framework adds an additional layer of complexity" to AI deployment, necessitating careful consideration of Data Privacy Protection Measures, Consent Management Processes, Information Security Protocols, and Compliance monitoring systems. This understanding is consistent with global trends in data protection concerns, as Botha and Grobler (2021) emphasise that South African businesses must manage complicated legislative frameworks using AI-driven HRM solutions, such as the Protection of Personal Information Act (POPIA).

5.3.2.3. Human Touch and Interaction

The participants emphasised keeping human interaction in HR operations, especially in the Durban manufacturing business context. The study demonstrates a cultural predilection for face-to-face contact, which creates distinct hurdles for AI applications. This study is particularly notable since it emphasises the need to consider local cultural settings while applying global technical solutions. Sanyaolu and Atsaboghena's (2022) research considers this by stating that AI lacks the emotional and psychological characteristics to comprehend how it influences human conduct, passion, and ambition.

The participants' views that AI should be a facilitating tool rather than a complete tool underlines the necessity for a balanced deployment that preserves meaningful human interactions while capitalising on AI's efficiency advantages, consistent with Fritts and Cabrera (2021) highlighting that the role of an HR professional is invaluable in creating a human perspective on work objectives and, therefore, the necessity of including human factors in HR procedures.

5.2.2.4. Job Security and Employee Resistance

The participants reflected concerns about job security, leading to AI implementation resistance. While the HR professionals interviewed were not particularly anxious about their job security, they did observe widespread fear among general employees. This resistance manifests as scepticism towards new technology and a reluctance to adapt current methods. Manda (2019) states that many South African manufacturing personnel lack digital literacy, particularly older workers and those in lower-skilled professions. This skill gap may result in a reluctance to adopt AI and decrease the efficacy of AI-driven HRM initiatives.

This finding is consistent with the change management literature by Olurin et al. (2023), highlighting that HRM plays a critical role in preparing the workforce for new challenges and opportunities that AI brings, emphasising the necessity of creating awareness, education and change initiatives and addressing concerns during these transitions.

5.3.2.5. Cultural Sensitivity

This research makes a distinctive contribution by identifying cultural sensitivity concerns specific to the South African environment. Participants expressed their concerns regarding AI's capacity to manage the country's complex cultural terrain, including multiple languages, accents, diverse cultural traditions and local practices and values. Manda and Backhouse (2018) highlighted that adopting egalitarian digital services in a multi-cultural and multi-lingual country like South Africa

is challenging since the process must overcome language, cultural divides, and long-standing hostility.

5.3.2.6. Transparency, Accountability and Trust

The study raises serious issues about the transparency of AI decision-making processes in HR settings. Participants emphasised the difficulties of comprehending how AI comes to its findings/solutions, which affects faith in the technology. This outcome is consistent with Markos and Sridevi's (2010) recommendation of engaging employees as a critical HRM practice in manufacturing. With the increasing complexity of manufacturing processes, engaged employees are more likely to contribute innovative ideas, adapt to changes, and understand the benefits of AI adoption, creating transparency, accountability and trust, therefore highlighting the importance of explainable AI in organisations.

The above findings from participants reflect that practical AI application in HR necessitates a nuanced approach that combines technological capabilities with human aspects, regulatory constraints, and cultural considerations. The problems outlined indicate that organisations must build comprehensive strategies that cover both the technical and human aspects of AI implementation.

5.3.3. Ethical Considerations

Exploring ethical considerations in AI application within HRM uncovers various interwoven themes, highlighting the complexities of incorporating AI technologies while adhering to ethical standards. Participants emphasised the significance of data privacy and confidentiality, human monitoring and verification, transparency, and disclosure, which invariably emerged as sub-themes.

5.3.3.1. Data Privacy and Confidentiality

Participants are concerned about data privacy and confidentiality, which is furthered by their profession in human resources, which represents the sensitive nature of HR information management. Participants emphasised the importance of strong privacy protections and competent data processing methods. Mtsweni and Hörne (2020) highlighted that using AI in HRM may result in unexpected breaches of employee privacy, particularly when algorithms make choices based on sensitive personal data.

Following the findings, organisations must set explicit data protection procedures to create an environment that encourages AI adoption. Participants emphasised a surety of confidentiality as a precondition for AI implementation, demonstrating how privacy concerns can either promote or impede AI adoption in HR practices. This part of the findings is consistent with current data protection frameworks and indicates that successful AI integration in HR necessitates strong privacy controls. Wisetsri et al. (2022) emphasised that ensuring and protecting data privacy is fundamental to ethical AI implementation in HRM.

5.3.3.2. Human Oversight and Verification

Participants emphasised the significance of human monitoring and verification as a two-fold ethical concern. First, human oversight ensures the preservation of genuine human relationships in HR procedures, which is still vital to the field's character. Artificial intelligence is a science that tries to reproduce features of human intellect, such as learning, reasoning, sensing, critical thinking, etc., using logic-guided computer programs (Vilani, 2018). AI cannot think ethically, act humanly, and reason rationally. This missing element of human relationships in AI, and understanding the nuances of human relationships, which AI is currently unable to cater to, has been highlighted by participants.

Secondly, it acts as a vital verification process for AI-generated information, with participants - directly recognising the possibility of mistakes in AI results. This is especially clear in a few

participant comments on the disparities between AI-generated content and actual legislation, implying that AI may not attain 100% accuracy, requiring expert human verification. Therefore, it emphasises the importance of balancing technological innovation and human involvement in organisational systems.

Brown (2023) described Artificial Generative Intelligence to which participants referred. These systems utilise large language models (LLMs) and deep learning architectures to process and generate contextually relevant responses, making them particularly valuable for business applications and organisational processes. However, they are not 100% accurate and may reference unreliable sources of information; therefore, the call from participants to verify, validate and authenticate the information through human verification.

5.3.3.3. Transparency and Disclosure

Transparency and disclosure appeared as the third ethical sub-theme, with participants strongly supporting open communication about AI's use in HR operations. The findings suggest that organisations should be open about using AI and actively educate staff about its ramifications. This transparency goes beyond simple disclosure to include informed consent for data use, as highlighted by participants.

According to the research responses from participants, openness serves several reasons, including building confidence, ensuring ethical compliance, and facilitating employee acceptance of AI systems in HR operations. This is reinforced by Ali and Torralba's (2024) research indicating that 69% of survey respondents from their study expressed concern about the lack of transparency in AI decision-making processes, emphasising the need for more explainable AI systems that provide insight into how judgements are made.

These ethical concerns of human oversight, privacy, and transparency form an interrelated paradigm for ethical AI adoption in HRM. The findings indicate that these factors cannot be addressed in isolation but must be considered part of a comprehensive approach to AI integration.

Human oversight protects privacy and promotes meaningful transparency; privacy concerns drive the need for human monitoring, and openness permits both effective human oversight and privacy protection. This interwoven relationship shows that organisations must build comprehensive strategies that address all three issues simultaneously to achieve ethical AI use in HR practices.

5.4. Research Objective Three: AI Impact on HRM Functions

The study highlighted four key areas where AI significantly contributes to HRM functions: recruitment and selection, performance management, learning and development, and employee engagement. Olurin et al., 2023 reiterated this by highlighting how HR departments run, from recruitment, learning and development to performance management and employee engagement, which the AI change will significantly impact. Each HR functional area offers unique prospects for AI integration and transforming existing HR procedures.

5.4.1.1. Recruitment and Selection

The majority of participants indicated recruitment and selection as a dominant sub-theme consistent with current industry trends and academic literature. Sanyaolu and Atsaboghena's (2022) research indicated that AI can automate repetitive operations after analysing enormous amounts of data to identify trends, speeding up the hiring process.

The findings show that AI's role in recruitment goes beyond basic automation, with sophisticated solutions for candidate screening and interaction. Ziang et al. (2020) further discovered that it is theoretically and practically conceivable to create an interview chatbot capable of actively listening, comprehending, and appropriately responding to various types of open-ended questions from job seekers. As technology evolves, we can expect even more advanced and effective chatbots to improve HR functions and the employee experience further (Siocon, 2024). This advancement suggests a more extensive revolution of the recruiting process, in which AI participates actively in candidate engagement and job design rather than simply filtering.

Participants' responses, especially considering AI's capacity to "streamline the recruitment process" and adopt automated tracking systems, indicate a transition or an already transitioned approach from traditional human screening to more efficient, data-driven techniques.

5.4.1.2. Performance Management

The research findings demonstrate AI's considerable potential to transform performance management techniques. The capacity to analyse employee performance data and deliver actionable insights marks a shift from traditional periodic evaluations to continuous, data-driven performance evaluations. This is consistent with current HR practices, which emphasise continuous feedback and development.

The participants' emphasis on AI's ability to identify high achievers and measure KPIs indicates a shift towards more objective, metrics-based performance evaluation. This transition can result in more equal and transparent performance management systems, lower human bias, and higher performance evaluation accuracy. Marr (2018) highlights that AI-powered systems can collect and analyse data from several sources in real-time, giving managers up-to-date information about employee and production line performance. Davenport (2018) reinforces this by reflecting that AI enables proactive management and helps to create realistic performance targets.

Tambe et al. (2019) contribute that AI technologies can automate certain aspects of the performance review process, lowering prejudice and enhancing objectivity.

5.4.4.3. Learning and Development

AI's ability to analyse and aggregate massive volumes of data can uncover gaps in an individual's knowledge. Participants reflected that the rise of learning and development which reflects the growing realisation of AI's ability to personalise employee development. The findings indicate a

trend from traditional one-size-fits-all training approaches towards more personalised learning experiences. Including immersive learning and virtual reality applications implies a shift towards more advanced and engaging training methods.

Participants' replies focused on AI's role in developing on-demand training materials and personalising learning experiences. Giving direction to a future in which learning and development programs are more adaptable and responsive to individual employee needs, leading to improved learning outcomes and skill development. Learner profiles can enhance the learning experience and teach employees new skills (Maity, 2019). Sohel (2019) reflected that AI in learning and development enables personalised learning materials, objectives, and information based on individual learning styles and preferences.

5.4.4.5. Employee Engagement

The findings show that AI's potential for promoting employee engagement through personalised initiatives and data-driven insights is becoming more widely recognised. The capacity to analyse engagement surveys and perform sentiment analysis is a more advanced method of analysing and enhancing employee satisfaction. Organisations may now forecast employee engagement levels using a variety of AI-powered prediction approaches. Sanyaolu and Atsaboghena (2022) highlighted that AI analytics models can be used to scan through various types of text, such as emails, chatbot messages, memos, media comments, and so on, to extract the necessary insights for analysing employee engagement. AI can optimise shift schedules based on individual preferences, talents, and productivity patterns, potentially leading to enhanced work-life balance and higher engagement (McKinsey, 2021).

According to participant feedback, AI allows organisations to take a more proactive approach to employee engagement, identifying and addressing engagement issues before they become significant problems. This results in more targeted and successful engagement efforts, potentially increasing employee retention and satisfaction.

5.4.2. Fostering Progressive Attitudes Toward AI Adoption

According to the research findings, successful AI adoption in HRM involves more than technological implementation; it also necessitates a strategic approach to building stakeholder acceptability and comprehension. The investigation revealed the theme of Fostering Progressive Attitudes Toward AI Adoption and two crucial sub-themes: the significance of effective Communication and Transparency and extensive Education and Training programs. These aspects are the foundation for developing an environment receptive to AI integration while addressing potential workforce resistance and competence deficiencies.

5.4.2.1. Communication and Transparency

The findings from participants emphasise the need for open communication in promoting AI adoption within HR functions. Participants' replies indicate that open communication regarding AI efforts helps to address stakeholder concerns and establish trust in the technology. This is consistent with change management concepts, which emphasise the necessity of transparent communication in technology adoption. Fritts and Cabrera (2021) highlighted that understanding and addressing the opportunities and challenges and communicating with all stakeholders allow organisations to maximise the offering of AI.

The emphasis on "wins and benefits" from participants highlights the importance of strategically articulating AI's value proposition. Successful AI adoption involves technological implementation, strong stakeholder management, and communication plans. Doshi-Velez and Kim (2017) further emphasise that building trust and acceptability among employees requires making AI systems explainable and their decision-making processes understandable to non-experts.

5.4.2.2. Education and Training

The findings highlight the critical role of technology knowledge and training in boosting AI adoption. According to the findings, HR professionals and business leaders must improve their digital competencies to use AI solutions effectively. Botha et al. (2022) indicate that South African organisations must focus on developing and educating their current skill sets in data science and analytics, machine learning engineering, AI ethics and governance, and domain-specific AI application knowledge. This emphasis on education is consistent with participant feedback demonstrating the importance of digital transformation preparedness in organisations.

Participants' replies underlined the importance of practical training and workshops, implying that academic knowledge alone is insufficient. The findings suggest that successful AI deployment necessitates a holistic strategy for developing organisational competence and understanding.

5.5. Framework for AI implementation in HRM from study findings

Based on the above findings, organisations can utilise the framework in model 5.1. to implement AI in HRM. The organisation needs to identify the Drivers within its business ecosystem, driving the need for AI and thereafter measure against current adoptions of other organisations, including the organisational resources of the business itself and other organisations. The framework identifies that organisations must identify Opportunities and Challenges in AI implementation, thus creating an understanding of the benefits and risks of implementing AI. Ethical Considerations should be considered given the myriad of considerations that may arise as per this study. Lastly, an integration strategy is required to ensure the smooth implementation of AI in HRM.

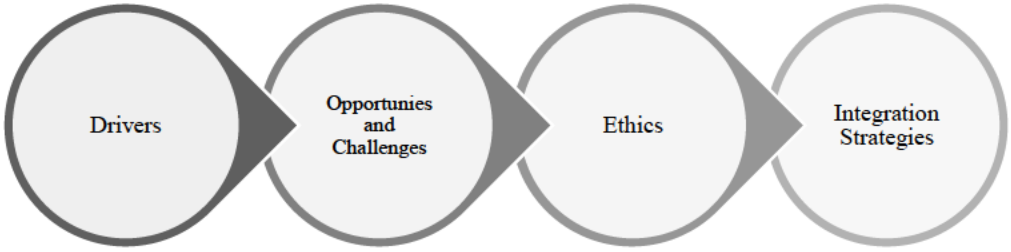

Figure: 5.1. Framework for AI implementation in HRM from study findings

Source: Author Compilation

5.5. Conclusion

The chapter discussed findings of AI's impact on HRM functions in Durban's manufacturing sector. In the discussion, the existing literature on the overall effect of AI on HRM and the impact of AI on core HRM functions were discussed, demonstrating AI's transformative potential in modernising HR practices while emphasising the importance of a balanced approach considering ethical implications. The findings show that successful AI deployment necessitates effective communication, transparency, education, and training initiatives, all emerging as critical components of AI integration. The next chapter concludes the dissertation.

Chapter Six: Conclusion

6.1. Introduction

The preceding chapter discussed the study's findings. This chapter includes the conclusion and recommendations. The chapter discusses the study's key findings thereafter explores the answer to the research questions. The chapter concludes with future research recommendations and limitations.

6.2. Answering the Research Questions

The study explored the impact of HRM in a manufacturing company, Durban South Africa. HR Manager's and HR Practitioners' experiences and insights on transitioning from the current HR approach to an AI-enabled approach to contribute to the body of knowledge surrounding the opportunities, challenges and potential impact of AI in HRM. To achieve this aim, the following research questions were answered:

Research Question One: What is the current state of AI adoption in HRM in a manufacturing company in Durban, South Africa?

The findings from participants reflect that AI adoption in Human Resource Management within Durban's manufacturing sector is still in its early stages of deployment. Organisations are still catching up with global norms, with evidence pointing to a significant technology gap between South African manufacturing enterprises and their international counterparts.

The study participants indicated three key areas in which AI is now used in South African HRM practices. Recruitment and selection emerged as the most formalised use. The second focuses on administrative automation, where organisations have switched from paper-based to digital systems. The third trend emerged as unofficial AI use within organisations. HR professionals use AI tools, particularly generative AI, to increase productivity in their daily work.

The adoption trend varies greatly depending on the organisational factors. Larger industrial organisations, particularly those with a worldwide presence, have higher AI adoption rates than smaller local enterprises. This inequality is primarily due to disparities in resource availability, technological capabilities, and access to global knowledge transfer. Financial constraints arose as both a hindrance and an opportunity.

Digital literacy has emerged as a significant barrier in the manufacturing industry, with research revealing that organisations are still in the learning and development phase of AI applications. The participants highlighted that while Durban's manufacturing sector actively integrates AI technology into HRM, particularly in recruitment and administrative activities, acceptance is still in its early phases. Formal and informal AI use growth indicates a two-pronged approach to innovation: organised organisational deployment and employee-led initiatives.

These findings are significant because they emphasise the need for strategic planning and policy-making that may close the highlighted gaps while capitalising on existing strengths in the manufacturing sector's approach to AI adoption in HRM practices. This insight can assist organisations in developing more successful strategies for integrating AI technologies while considering their unique contexts and capabilities.

Research Question Two: What are the opportunities and challenges of implementing AI in Human Resource Management in a Durban, South Africa manufacturing company?

The significance of this research question is understanding how AI may revolutionise HRM processes in Durban, South Africa's manufacturing industry, while addressing the context's particular problems and ethical implications. The participants reflected that as manufacturing businesses adopt more technological solutions, knowing AI deployment's prospects and potential pitfalls in HRM is critical for successful digital transformation while maintaining cultural sensitivity and workforce engagement.

The participants indicated the potential for AI deployment in HRM in Durban's manufacturing sector. AI significantly improves efficiency and productivity by automating regular processes,

which is especially beneficial in the manufacturing sector, where large-scale operations are widespread.

The participants also identified challenges with implementing AI in human resource management within Durban's manufacturing sector. A significant challenge is the accuracy and reliability of AI systems, which necessitates ongoing human verification and control. Legal and regulatory compliance, particularly with South Africa's Protection of Personal Information Act (POPIA), complicates AI implementation in HR procedures. Cultural sensitivity is a unique problem in South Africa, as AI must manage multiple languages, accents, and cultural practices.

Ethical considerations provide a vital framework for AI application in human resource management in Durban's manufacturing sector. Data privacy and confidentiality are top priorities, especially given the sensitive nature of HR information and the requirements of POPIA compliance. Human oversight is required for two reasons: to retain true human interactions in HR procedures and to ensure the veracity of AI-generated information. Transparency and disclosure about AI deployment are critical for fostering employee trust and acceptance. The participants indicated that to enable ethical AI application in HR practices, organisations must build complete plans that cover privacy, human oversight, and transparency simultaneously.

Research Question Three: How does Artificial Intelligence impact critical HRM functions within a manufacturing company, in Durban, South Africa?

The significance of this study question stems from understanding how AI technology might disrupt traditional HR practices in the manufacturing industry, particularly in growing economies such as South Africa. Understanding AI's impact on HRM activities is critical for making educated decisions regarding technology adoption that might improve human capital management.

The study's findings show that AI has a major impact on four essential HRM functions in Durban manufacturing organisations. AI has altered the employment process in recruiting and selection by automating candidate screening and offering sophisticated candidate interaction tools. AI has facilitated a transition in performance management from traditional periodic reviews to continuous, data-driven assessments. Participants agreed that AI's ability to provide tailored

learning experiences had transformed the learning and development function. AI has enabled organisations to take a more proactive approach to employee engagement by leveraging tailored initiatives and data-driven insights.

Positive attitudes towards AI adoption must be fostered to ensure that AI is successfully implemented in various HRM roles. Participants emphaised the need for communication, transparency, and education and training. Open communication regarding AI initiatives alleviates stakeholder concerns, and fosters trust in the technology. Furthermore, participants emphasised the significance of acquiring digital capabilities through practical training and seminars to effectively understand and use AI solutions. The influence of AI on HRM operations in Durban's manufacturing sector shows a trend towards more efficient, data-driven, and personalised human resource management techniques.

6.3. Recommendations for AI in HRM:

The study findings will benefit manufacturing and other organisations seeking to adopt AI in HRM. The study will also be helpful to organisations with a specific area of concern that AI may provide a solution to rather than the traditional approaches available. The following are recommendations to organisations:

- **AI adoption strategy:** Organisations should establish a comprehensive AI adoption strategy that addresses the organisation's specific goals and capabilities thereafter, implement a gradual strategy for AI adoption, beginning with areas with the most significant potential return (recruitment and administrative activities) Which establishes metrics to measure the effectiveness of AI implementations.
- **Policy implementation:** Organisations should establish clear policies and guidelines for formal and informal AI use in HR tasks, encouraging disclosure and transparency.
- **Ethical Compliance:** Organisations should create robust data privacy protocols that comply with POPIA regulations. Set up clear criteria for human monitoring in AI-driven

choices, creating transparent frameworks for communicating AI use with employees. Conduct regular audits of AI systems to ensure bias impartiality and no bias.

- **Capacity Building:** Develop training and literacy workshops focussing on AI tools and their uses in human resources, by establishing continual learning processes to keep up with AI breakthroughs, helping the organisation determine what tools may be helpful for their needs.
- **Change Management:** Organisations should create change management measures/plans to overcome resistance, develop communication strategies to address job security concerns, and further establish feedback systems for employees to express their concerns about AI implementation that consider culturally sensitive protocols.

6.4. Limitations for future research

The study presents potential areas for future research. Expanding the research scope beyond a single Durban manufacturing company could provide more comprehensive insights into AI usage in South Africa's various sectors and geographical regions. Given the rapid advancement of AI technology, longitudinal studies would be useful for tracking how implementation problems and opportunities change over time. While this study focused on early-stage AI adoption, future research might investigate the entire lifecycle of AI deployment in HRM, including advanced implementation phases. Furthermore, comparative studies conducted across several South African manufacturers would aid in establishing industry benchmarks and best practices for AI integration into HRM operations. Such research would contribute to a more comprehensive understanding of AI's role in South African human resource management.

6.5. Conclusion

The study shed light on the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa. According to Sanyaolu and Atsaboghena (2022), artificial intelligence in HR management boosts human intelligence by automating routine tasks, allowing HR practitioners to focus on more strategic operations. The study's findings

substantially backed this assumption, revealing that while AI adoption is still in its early stages, it is already revolutionising important HR activities in the manufacturing industry. AI tools should be used as a support tool for Human Intelligence rather than a replacement; therefore, HR's future lies in transforming into a strategic partner for AI implementation. HR professionals will use AI insights to make data-driven strategic decisions instead of just overseeing its deployment.

While AI utilisation in Durban's manufacturing industry is still in its early stages, it reflects the potential for altering HR practices. The key to a successful deployment is to balance technical innovation and human-centred approaches, ensuring that AI enhances the human element in HR management. The future of human resources in manufacturing will be determined by organisations' capacity to negotiate these changes while preserving ethics, cultural sensitivity and workforce engagement.

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APPENDICES

Appendix A: Informed Consent

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

INFORMED CONSENT

Information Sheet and Consent to Participate in Research

Date:

Dear Sir Madam,

My name is Avikar Rajcoomar. I am pursuing a Master of Business Administration degree at the University of KwaZulu Natal's Graduate School of Business and Leadership.

You are invited to consider participating in a study, *Investigating the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa*. The aim and purpose of the research is to investigate the current state of AI adoption in HRM in the manufacturing industry in South Africa; this research aims to provide valuable insights for HR professionals and business leaders, enabling them to keep abreast with technological changes and create a competitive advantage for their businesses.

Should you choose to enrol and remain in the study, the interview is expected to last approximately 45 minutes. It will involve an in-depth one-on-one interview via Zoom or Microsoft Teams, during which you will be asked questions related to the impact of AI on Human Resource Management in the manufacturing sector.

I hope the study will provide insights into the adaptation of AI in Human Resources management and how it influences business approaches.

No costs will be incurred by participants as a result of participation in this study and there will be no incentives or reimbursements for participation in this study.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/00007051/2024).

If you have any concerns, you may contact me by e-mail at 200308719@stu.ukzn..ac.za or telephonically or at [redacted]or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban, 4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

CONSENT

I _____, have been informed about the study titled, *Investigating the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa,* by Avikar Rajcoomar.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 200308719@stu.ukzn.ac.za or telephonically at [redacted].

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview YES / NO

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness **Date**
(Where applicable)

_____ _____
Signature of Translator **Date**
(Where applicable)

Appendix B: Interview Schedule

Interview Questions:

<u>Research Question One:</u> What is the current state of AI adoption in HRM in South Africa's manufacturing industry?

1. What is the current trend of AI adoption in HRM globally?
2. How does the South African manufacturing industry's current adoption of AI in HRM compare to the global environment?
3. How is AI technology currently used in Human Resource Management in the South African manufacturing industry?
4. What are some of the important factors influencing the adoption of AI in HRM within the South African manufacturing industry?

<u>Research Question Two:</u> What are the potential opportunities and challenges of implementing AI in HRM in South Africa's manufacturing industry?

1. What are the potential opportunities for using AI-driven tools for HRM in the manufacturing sector in South Africa?
2. What are the potential challenges that may arise from implementing AI in HRM within the manufacturing industry in South Africa?
3. What ethical considerations should be addressed when adopting AI in HRM within the manufacturing industry in South Africa

Research Question Three: How does Artificial Intelligence impact critical HRM functions within the manufacturing industry in South Africa?

1. In what areas might AI improve HRM in the South African manufacturing industry? e.g., performance management.
2. What impact does AI have on recruitment, selection and employee engagement in the South African manufacturing industry?
3. What impact does AI have on performance management, learning and development in the South African manufacturing industry?
4. What strategies relating to the above can the South African manufacturing industry adopt to foster a progressive attitude towards AI adoption among business leaders and HR professionals?

Thank you.

Appendix C: Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

14 June 2024

Avikar Rajcoomar (200308719)
Grad School of Bus & Leadership
Westville Campus

Dear A Rajcoomar,

Protocol reference number: HSSREC/00007051/2024
Project title: Investigating the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 16 May 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

Incidents of adverse events and serious adverse events (AEs and SAEs) should be reported in writing to HSSREC, the study sponsors, and any regulatory authority (where appropriate), within 7 working days of the occurrence for local sites and 14 days for all other South African sites.

This approval is valid until 14 June 2025.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)
/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics
founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix E: Editors Declaration

RS WEB SOLUTIONS
MEDIA & EDITING SERVICES

[redacted]

CERTIFICATE OF EDITING

This document certifies that a copy of the thesis whose title appears below was edited for proper English language usage, grammar, punctuation, spelling, and overall style by Shamiel Johnson whose academic qualifications appear in the footer of this document. The research content and the author's intentions were not altered during the editing process.

TITLE:

Investigating the impact of artificial intelligence on human resource management in a manufacturing company in Durban, South Africa

STUDENT:

Avikar Rajcoomar

200308719

Yours faithfully

[redacted]

Shamiel Johnson

27 November 2024

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