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The exploration of technological advancement changes on employee optimal performance: A case of Ubuhlebezwe Local Municipality

BY

MR LETHUKUTHULA PAUL DLAMINI

221059003

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Supervisor: Dr Mlondi Vilakazi

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Acknowledgements

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Dedication

I dedicate this research study to my mother, the beautiful Mrs. B. C. Dlamini, and my supportive partner, Ms. Z. Mndaweni.

Abstract

The COVID-19 pandemic has accelerated the integration of technology solutions into organizations to ensure continuity in operations. It emphasised the role played by technology to enhance communication in the workplace. The advent of new technologies in the workplace has an impact on employees and their understanding of how things should be done. Therefore, this study aimed to investigate the impact of technological advancements on employees at the Ubuhlebezwe Local Municipality. Using a pragmatic worldview, the study adopted a qualitative approach and gathered relevant information through semi-structured interviews involving ten (10) administrative officials operating in key departments in the municipality to aid in gaining an in-depth understanding of the contribution played by technology to enhance service delivery. Thematic content analysis was used to interpret and analyse the data, which confirmed an urgent need for an upgraded technology infrastructure, especially in rural municipalities such as Ubuhlebezwe. The findings revealed that the lack of decent infrastructure significantly affects the retention of talented personnel, as they tend to seek employment in organisations that utilise better tools, thereby impacting the effectiveness of service delivery and the overall performance of the municipality. The study concludes that prioritised investment in robust technological infrastructure is vital for operational functionality and skilled employee retention in rural municipalities like Ubuhlebezwe. Further research is recommended to optimise this infrastructure. Proactively managing technological transitions, by addressing positive and negative consequences, allows the Ubuhlebezwe Local Municipality to leverage advancements. This enhances worker productivity and service efficacy while safeguarding their health and ensuring a smooth transition.

Acronyms

The acronyms have been organised alphabetically.

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
COVID- 19	Corona Virus 2019
OECD	Organisation for Economic Cooperation and Development
PU	Perceived Use
PEOU	Perceived Ease of Use
SPSS	Statistical Package of Social Science
TAM	Technological Acceptance Model

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CHAPTER 1 – INTRODUCTION AND BACKGROUND

1.1 Introduction

Although technology has emerged as a crucial component that may assist administrative staff in carrying out their daily duties effectively, many organisations view it as a complex and interrelated tool (Wolff, 2021). Existing research suggests that employee performance is likely to be influenced by an organisation's effective use of technology. Technology has been identified as one of an organisation's most essential tools (Gunawan, Suroso & Syarief, 2022). Every profession at work heavily depends on technology as it lowers the possibility of human mistakes, boosts productivity, and speeds up communication. Implementing cutting-edge technology that enables people to do certain activities might reduce employee workload.

In the 21st century, technological breakthroughs that increase productivity, efficiency, profitability, and safety have been spurred by the digitalisation of industrial and managerial processes (Conceição, Rocha, Silva & Conceiçã, 2020). The use of technology influence's organisational structure, employee behaviour, performance, and interpersonal relationships, which in turn influences working processes and performance (Sulistianingtiyas & Djastuti, 2022). Additionally, technological advancements may negatively impact worker stress, job satisfaction, and performance, leading to errors, delays, and lost productivity (Rasool, Warraich, & Sajid, 2022). Furthermore, technology is the use of information to optimise human potential, enabling individuals to perform tasks more efficiently or achieve goals they were previously unable to attain (Conceição et al., 2020). Technology is a dynamic phenomenon that impacts an organisation's structures, procedures, and practices while also having the ability to improve employee attitudes and performance (Sulistianingtiyas & Djastuti, 2022). According to Minh Ha, Luan, and Thanh Khoa (2021), employee performance is the primary determinant of an organisation's success.

Without a doubt, firms aiming to remain competitive and relevant in the rapidly evolving modern business environment must integrate technology as a fundamental component of their operations (Baskaran, Lay, Ming & Mahadi, 2020). The degree to which people are engaged and dedicated, as seen by their conduct and overall

performance, determines a company's capacity to thrive and grow sustainably. There are more advantages to this connection than just the apparent financial ones. Many interconnected elements are involved in the complex dynamic at work, which influences how people behave and think within the company's framework. According to Masa'd and Aljawarneh (2020), these factors include the work environment in which employees work, their relationships with supervisors and coworkers, their level of job satisfaction, the effectiveness of their leadership styles, and the effectiveness of the reward system.

This study aimed to investigate the precise manner in which various technological advancements impacted and improved the overall job satisfaction, productivity, and efficiency of personnel in the Ubuhlebezwe Local Municipality. By examining the connection between employee performance metrics and technology adoption, this study sought to identify the most effective technological strategies for enhancing organisational outcomes.

1.2 Background

Whether they are urban or rural, municipalities are required to provide high-quality services to their residents. This might present challenges because rural municipalities are not granted the same rights as metropolitan municipalities. As a rural municipality, Ubuhlebezwe was chosen for this study to gain a deeper understanding of the challenges it faces in adopting technology and to offer recommendations to the municipality on how to upskill its staff to close the skills gap and utilize technology to address some of the issues encountered in service provision. Other rural municipalities might use the study's findings as a guide to enhance their own.

Organisations in all industries are under tremendous pressure to adopt and integrate contemporary technologies into their operations in today's rapidly evolving technological landscape. These technological advancements have proven challenging for the public sector to adopt, despite being essential for administrative staff to carry out their jobs efficiently. This fact is evident in the Ubuhlebezwe Local Municipality, a Category B municipality in the Harry Gwala District of KwaZulu-Natal Province, South Africa.

Although technology has the potential to improve productivity, efficiency, and service delivery, staff performance and preparedness are key factors in its effective adoption. Employees must learn new skills, adjust to new procedures, and align their attitudes and behaviors with organisational objectives to effectively embrace technological improvements. However, the public sector frequently confronts challenges that may hinder the successful adoption of contemporary technology, such as entrenched administrative structures, cultural barriers, and resistance to change. This research aimed to examine the impact of technological improvements on the performance of employees at Ubuhlebezwe Local Municipality. This study examines the obstacles, attitudes, and variables influencing the adoption of contemporary technologies, providing insightful information that can inform plans for effective technology integration and enhanced worker performance in the public sector.

By conducting a thorough analysis, this study will contribute to the broader conversation on managing technological change and offer valuable insights for navigating the challenges of technology adoption and its impact on worker performance in public sector organisations. This research is on the Ubuhlebezwe Local Municipality, a Category B municipality in the Harry Gwala District of KwaZulu-Natal Province, South Africa. The municipality is responsible for providing its residents with access to essential services as a local government body. An appropriate site for investigating how technological developments impact employee productivity in the context of the public sector is the Ubuhlebezwe Local Municipality. Like many other public institutions, the municipality struggles to keep pace with the rapid advancements in technology needed to enhance operational efficiency and service delivery. Such challenges include the digital divide caused by differences in income and education levels, meaning that people with lower incomes and less education are likely to struggle with technology use and require extensive training, which leads to the next challenge: human capital. Compared to the private sector in South Africa, the public sector lacks qualified IT personnel. A limited budget is also a challenge faced by municipalities, as they cannot afford to implement digitalisation. This study sought to gain insights into the specific dynamics and nuances of technology adoption and its impact on employee performance in a local government setting, with a focus on Ubuhlebezwe Local Municipality. The investigation was focused on the municipality's administrative staff, who are crucial to achieving the organization's goal.

Figure 1.1 Map of Ubuhlebezwe Local Municipality

Source: Municipalities of South Africa (2024)

Theoretical Background

To determine the best technical approaches for improving organisational results at the Ubuhlebezwe Local Municipality, this study examined the relationship between employee performance measures and technology adoption. Roh, Park, and Xiao (2023) claim that the Theory of Reasoned Action, which aims to clarify the connections between attitudes and behaviours in human actions, is significant in forecasting an individual's future actions based on their prior attitudes and behavioural intentions. According to Nickerson (2023), Martin Fishbein and Icek Ajzen initially proposed the Theory of Reasoned Action in 1975 as an extension of the information integration theory, another model of human behaviour. Attitudes, intentions, and beliefs are the three main pillars of the Theory of Reasoned Action. A person's beliefs often determine the likelihood that a particular action will result in a specific outcome; their attitudes reflect whether they perceive that outcome as good or unpleasant; and their intention is how they plan to respond to their beliefs and attitudes.

Figure 1.2 Theory of Reasoned Action

The primary focus of this research study was the attitudes of Ubuhlebezwe Local Municipality employees, which influenced their views on technology and its impact on their productivity at work. The literature review highlighted that adjusting to new technology can lead to technostress, making people reluctant to adopt technological change. This research study also examined whether employees believed that technology would replace them or viewed it as a risk of job loss. It investigated whether this perception would have affected their performance, productivity, and intention to embrace the opportunity.

1.3 Statement of the problem

Modern technology is a constantly evolving field, and new developments in this field are accelerating change. Organisations often strive to stay current by implementing new technology to stay relevant. This can be advantageous for municipalities in rural areas, as technology is meant to make life and work considerably simpler. However, the implementation of technology can also be challenging because existing workers in these municipalities may be reluctant to accept the change if they believe it will increase their workload as they will be required to attain a new set of skills, which may cause the existing set of skills to be redundant leading to anxiety among the municipal workers. It might also make them feel threatened if they believe that the implementation of technology would replace their work. In KwaZulu-Natal's Harry Gwala District, the Ubuhlebezwe Local Municipality is a Category B municipality responsible for providing community services. The Harry Gwala District Municipality comprises four local municipalities, including the Ubuhlebezwe Local Municipality. Large agricultural plantations, native vegetation, and traditional authority land are its defining features. The Ubuhlebezwe Local Municipality's settlement patterns indicate that it is primarily a rural area. The Ubuhlebezwe Local Municipality faces significant obstacles, as outlined in the 2024–2025 Integrated Development Plan. The main issue

is that, due to its location, it struggles to retain qualified employees. Due to their size and reliance on grants, they are unable to compete with other municipalities on salaries. Another factor linking this research is the absence of excellent service providers in the district who can offer training programs.

Johannes Bester conducted a study in 2024 titled "Exploring the Preparedness of South African Rural Municipalities Ties in the Adoption and Use of Artificial Intelligence to Improve Service Delivery," in which the study's conclusions showed that implementing technology in rural municipalities would improve communities' access to information, lower corruption, boost transparency, and promote accountability. Consequently, this research also aims to help municipalities acknowledge that change is unavoidable and should be welcomed rather than feared, and to provide access to ongoing training to keep municipal employees' skills set up to date. This will also ensure that there is efficient service delivery for the municipality.

Although technology is essential in South Africa, the public sector faces several challenges in advancing and implementing technological advancements. South Africa's public sector struggles to keep pace with the technological advancements required for administrative staff to perform their jobs efficiently (Siriram, 2022). The public sector has faced increased pressure in recent years to deliver integrated and efficient services to its citizens. Modern technology is essential for nations as well as for companies and governments (Omar, Munir, Kaizan, Noranee & Malik, 2019). Businesses cannot use outdated technology to function. Human performance is enhanced when employees or individuals use technology in an ethical manner and for the benefit of the company. Groups tend to adopt new technology more rapidly than individuals, who may find it difficult to do so (Al Ahbabi, Singh, Balasubramanian & Gaur, 2019).

This study aims to investigate the technological advancement changes on employee optimal performance: A case of Ubuhlebezwe Local Municipality. Bjerke-Busch and Aspelund (2021) outline specific challenges faced by the public sector, which help explain why public sector institutions are more resistant to technological changes. These challenges include long-standing organisational principles and procedures, the work environment culture, the lack of a need for change, and reliance on financial and administrative models.

1.4 Aims and objectives of the study

1.4.1 Aim of the study

This research aimed to examine the precise ways that different technological developments affected and enhanced the Ubuhlebezwe Local Municipality employees' productivity, efficiency, and general job satisfaction. It sought to determine the best technology approaches to improving organisational results by examining the relationship between staff performance measures and the introduction of technology.

1.4.2 Objectives of the study

i. To examine the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality.
ii. To evaluate Ubuhlebezwe Local Municipality employees' attitudes and views of these technological advancements, as well as any obstacles they may be facing.
iii. To determine measures that can facilitate technology development and improve workers' productivity in the Ubuhlebezwe Local Municipality.

1.4.3 The main research question & subsequent research questions

The primary research question: How do technological changes influence employee performance in organisations?

Sub-questions:

i. What are the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality?
ii. What are employees’ attitudes and views towards technological advancements at Ubuhlebezwe Local Municipality?
iii. What measures can be suggested to facilitate technology progress and improve workers' productivity in Ubuhlebezwe Local Municipality?

1.5 Justification for study

Technological innovation and advancements have become increasingly important to the country due to global competitiveness. Researchers concentrated on change management, specifically the reasons behind change and the various types of resistance to change that exist in South Africa. Most of the research used literature review-based analysis. The research provides management with a wealth of information about employee behaviour, interpersonal relationships, and technological performance, which will enable the organisation to decide whether to adopt modern technology and assist in training its employees to use it effectively. Only professionally trained personnel can carry out their responsibilities and help the company achieve its goal. This study will raise awareness of technostress, enabling the organisation to support its employees in reducing their stress levels. Research has been conducted on the impact of technology on the interpersonal connections of employees, which aims to strengthen their bonds and enhance their ability to contribute to the company's success through group collaboration.

The way organisations function has been entirely transformed by technological breakthroughs, and local governments are no exception. Like many other municipalities, the Ubuhlebezwe Local Municipality has recently experienced significant technical advancements, including the adoption of new digital platforms, hardware, and software. These adjustments are frequently made to increase productivity, efficiency, and community service delivery. However, the capacity of staff members to adjust and use these tools efficiently is essential to the successful deployment and utilisation of contemporary technology. Workers who struggle to keep up with technological advancements may become less productive, more irritable, and perform worse overall. The researcher will assess the degree to which technological changes have impacted employee performance at the Ubuhlebezwe Local Municipality. Additionally, the impact of technological changes on employee performance can have far-reaching consequences for the municipality, as poor employee performance can result in inefficient service delivery, increased operational costs, and dissatisfaction among residents and stakeholders. The research will provide valuable insights into the potential advantages and challenges of implementing contemporary technologies in a local government context. The results of this study can inform the development of training programs, change management

initiatives, and user-friendly systems, among other strategies and interventions, to support staff in adapting to technological changes. Additionally, the study can advance the general understanding of how technology affects public sector employee performance, which can benefit other municipalities and government agencies.

Ultimately, the Ubuhlebezwe Local Municipality can improve service delivery, increase operational efficiency, and better meet community needs by addressing the potential problems presented by technological innovations and encouraging staff to adopt them.

1.6 Literature Review

Both large and small firms may have to invest a significant amount of money to upgrade or purchase technology (Methode, Osunsan, Florence, Augustine, Abiria, & Innocent, 2019). Comparing the expected value brought to the business with the cost of the upgrade or adoption is necessary for this. Small businesses sometimes postpone adoption or upgrading because of financial concerns. However, technology that provides significant operational gains can lead to long-term cost reductions through increased earnings. Recent studies have primarily focused on the importance of encouraging staff to adopt technology in the workplace. Furthermore, employee performance is significantly impacted by technological improvements (Imran, Maqbool, & Shafique, 2014). Employee performance is favourably correlated with the successful deployment of technology, as several studies have repeatedly shown. To encourage employees to quickly acquire the new skills and knowledge required for updated technology, businesses must provide training and skill development programs.

1.6.1 Technological changes

It is challenging to observe, understand, and assess technology, as it is an abstract concept (Baskaran, Lay, Ming, & Mahadi, 2020). It is composed of two basic parts: informational (knowledge in management, marketing, production quality control, dependability, skilled labour, and functional domains) and physical (things, tools, equipment, blueprints, procedures, and processes) (Al-Shameri & Omar, 2022).

Combining and rearranging current information to produce breakthroughs is what propels technological advancement. Businesses' performance is impacted by this technological innovation (Cascio & Montealegre, 2016). An organization's personnel's

talents are the source of its technological breakthroughs. As a result, personnel performance and technical advancement are closely related. Only when workers expertly combine technologies with other resources and use them productively and ethically can productivity increase or performance improve (Duman & Akdemir, 2021).

In support of this argument, Sugiarti (2022) explains that in today's fiercely competitive global economic environment, companies that fail to keep pace with technological advancements risk falling behind their rivals in terms of productivity and competitiveness, which could lead to substantial losses. If a large firm excels in management, finance, and technology, it usually reduces production while earning more money from its ideas, trademarks, experience, and technical advantages. Organisations have varying capabilities in terms of different technologies, which results in noticeable differences among them (Riyanto, Endri, & Herlisha, 2021).

According to Martínez-Caro, Cegarra, and Ruiz (2020), technology advances by reorganising and combining information to generate fresh ideas. This rapid development will significantly impact how businesses operate. Internal progress, which results from personnel abilities, can be linked to technological improvements. Employee performance and technical progress are closely related (Alam & Murad, 2020). The ethical and productive use of technology, its integration with other resources by human resources, and its practical usage may all lead to increased productivity or better performance (Singh & Verma, 2019).

1.6.2 Employee performance

The practical completion of assigned tasks by an individual or group of employees, as evaluated against established acceptable criteria established by a supervisor or organisation, is known as employee performance. This entails making effective and efficient use of the resources at hand in a dynamic workplace (Tampi, Nabella, & Sari, 2022). According to Sriningsih, Martini, and Nursaid (2022), performance is linked to elements like output amount, output quality, punctuality, attendance, and job effectiveness. Through training programs, staff members can quickly learn new material and enhance their existing skills. A well-trained and motivated workforce is crucial for driving and effectively managing an organization's technological advancements. The acceptance and efficient use of new technologies are directly made possible by their performance (Riyanto, Endri & Herlisha, 2021). There is a

strong correlation between an employee's performance and the results of their work in an organisation. Although the work may be produced in terms of quantity, quality, and timeliness, performance evaluation is the most crucial component of employee development in an organisation. Performance evaluation is merely a representation of an employee's performance appraisal form (Irfansyah, 2020).

The practice of examining and grading an employee's work is known as a performance evaluation (Murphy, 2020). Additionally, it is often and consistently carried out to enhance career progression, boost employee engagement, and positively affect pay distribution (Vizano, Utami, Johnes, & Herawati, 2021). The primary incentive structure inside an organisation is the pay that workers receive in return for their labour, which can boost employee engagement (Hapsari, Riyanto, & Endri, 2021). When gathering information and statistics on employee achievement, a quantitative and objective method should be used in the performance review process. The only person with the power to conduct the evaluation is the employee's supervisor. The performance evaluation encompasses work plan, execution, coaching, and supervision.

Human resource performance is closely linked to the innovation and transformation of technology, and a collaborative approach involving human resources may be an effective way to manage technological development. While anyone can innovate and make significant technological advancements, the complexity of modern technology requires the skilful fusion of several breakthroughs based on various technological facets (Tampi, Nabella & Sari, 2022). As a result, human resources must work together, independently, and pool their creativity to produce new products, services, and technologies. Individual inventiveness becomes viable and significant when combined with the creativity of others. Individual and collective creativity are distinct, but they cannot coexist in the production process unless they are successfully integrated and controlled to yield a desired outcome (Sulistyawati & Bahruni, 2021). Collective innovation is also impossible without individual creativity. To ensure the survival and competitiveness of an organisation, managers must provide a collaborative and team-oriented work environment that inspires people to take the initiative and innovate.

1.6.3 Technological Changes and Employees' Performance

Since the early 1900s, the world has undergone a revolution in information technology (Holmstrom, 2015). Due to the increasing globalisation of markets, many firms are facing increased competition. These companies must thus be able to manufacture customised items of exceptional quality quickly and economically in order to compete in the export market both domestically and internationally. It is generally accepted that resolving this issue requires the implementation of cutting-edge technologies. Many businesses are adopting technology to boost organisational efficiency and work effectiveness.

There are several advantages to using technology, and businesses can utilize it more effectively. Modernisation, higher productivity, competitiveness, and sustainable growth are all facilitated using contemporary technology. Technology adoption saves energy, reduces resource consumption, is beneficial for the environment, may provide high economic value, and enhances the company's overall performance (Pham, Pham-Nguyen, Misra, & Damaševičius, 2020).

The impact of technological improvements on the productivity of employees in the commercial printing industry (Wanza & Nkuraru, 2016). Technology advancements were shown to have an impact on employee performance in several areas, including job redundancy, employee turnover, and workplace motivation. It was found that technological improvements impacted the skills and performance levels of people in this industry.

Technology influences employee behavior, performance, interpersonal interactions, working processes, organizational structure, and overall performance (Sulistianingtiyas & Djastuti, 2022). Technological developments can have a detrimental impact on employee stress levels, job satisfaction, and performance, which can lead to mistakes, delays, and wasted time. On the other hand, technology utilizes information to enhance human skills, making previously unattainable jobs feasible or facilitating more efficient task execution. Technology is a growing phenomenon that affects an organization's structures, procedures, and methods, and may also improve employee performance and attitudes (Sulistianingtiyas & Djastuti, 2022). Employee performance plays a significant role in an organization's success (Minh Ha, Luan, & Thanh Khoa, 2021).

Imran, Maqbool, and Shafique (2014) investigated the relationship between technological advancements and employee performance in the banking sector, finding that these advancements have a significant impact on employee motivation and training needs, as well as a strong correlation between technological advancements and employee performance levels. Wanza and Nkuraru (2016) found that due to the rapid changes in technology worldwide, evolving technologies have an impact on employee performance by reducing workloads and increasing efficiency and effectiveness.

Furthermore, when technology is implemented in businesses, it is important to understand how employee productivity and individual performance are affected by its adoption. This is because businesses can utilize technology more effectively if the benefits of its adoption are communicated to employees and are valuable, as stated by Tusiimemukama (2019). This facilitates acceptance and adoption, which in turn lowers costs, improves operations, enhances customer service, and boosts overall performance at both the individual and organisational levels.

According to Nohria and Gulati (2016), adopting technology enhances work performance, and a positive correlation exists between a firm's technical capabilities and job performance. For example, a corporation can gain a competitive edge over its competitors by utilising technology like computers, smartphones, and email with easy access to the internet, as well as maintaining a connection with potential and existing funders, accelerating staff interactions, producing high-quality and quantity products that improve job performance, improving the company's reputation, and making it an employer of choice.

1.7 Theoretical framework

The Technology Acceptance Model (TAM) (Davis, 1989) will serve as the theoretical framework for this study. A study's theoretical framework is essential because it forms the foundation for all knowledge related to the research (Muniesa & Gimenez, 2020). It will be used to justify the study, formulate the problem statement, define the purpose, outline significance, and frame research questions. A theoretical framework is also essential for data analysis because it provides a lens through which findings can be interpreted and new insights can be found within the chosen research domain.

To ensure the successful design and deployment of a technology system, the Technology Acceptance Model (TAM), which was developed to gain a comprehensive understanding of the user acceptance process, will be utilized to investigate how technological changes impact employee performance at Ubuhlebezwe Local Municipality (Nurqamarani, Sogiarto, & Nurlaeli, 2021).

According to the Technology Acceptance Model (TAM), which is applicable in both consumer and business contexts, the desire to adopt technology is based on key factors that determine its usefulness and ease of use (Davis, 1989). The model suggests that technology is perceived as more advantageous when it is easy to use. For example, Davis, Bagozzi, and Warshaw (1989) found that perceived utility measures how much users believe technology improves work performance, while perceived ease of use measures how easy it is to use technology.

The TAM model identifies two key factors that influence a person's propensity to use technology:

Perceived Usefulness (PU): This refers to the degree to which an individual believes that using technology will increase their productivity or performance at work; people are more likely to embrace and use technology if they believe it will benefit them and make their jobs easier; "Perceived Ease of Use" (PEOU) refers to the degree to which an individual believes that using technology will be easy or require no effort; people are more likely to adopt and use technology if they believe it will be easy to use and learn.

According to the Technology Acceptance Model (TAM), a person's attitude towards using technology is impacted by both perceived usefulness and perceived ease of use. This attitude then affects the person's behavioural intention to use the technology. This behavioural aim eventually determines the actual usage habit. Other factors that may affect technology adoption, such as individual differences, enabling circumstances, and societal influence, have been added to and modified throughout time to the TAM model. The TAM model, despite its simplicity, has proven to be a valuable paradigm for understanding and forecasting the adoption of technology in various contexts, including consumer technology, education, and the workplace.

1.8 Research Methodology

A research methodology, according to Bertram (2014), is a strategy that describes the systematic collection and examination of data required to address the research issue. The necessity of a strategy that outlines the study's goals, the types of questions that will be asked, data collection techniques, sample selection, and data analysis processes is also emphasized by Grey (2014). There are three acknowledged methodologies in research: qualitative, quantitative, and mixed-methods approaches. According to Rahman (2017), Various study fields, including psychology, medicine, and history, among others, employ either qualitative, quantitative, or mixed-methods research methodologies. The qualitative approach refers to study findings that are not obtained using statistical techniques or other quantitative measurement methods (Rahman, 2017). Qualitative research focuses on people's own emotions, behaviours, and sentiments. In contrast, the quantitative method focuses on quantification in data gathering and analysis. The mixed methods approach offers philosophical presumptions that provide guidance for gathering and analyzing data from multiple sources in a single study (Dawadi, Shrestha, & Giri, 2021). For this research study, a qualitative approach will be used.

There are various types of qualitative research methods, including case study, Narrative, Interviews, Action research, Records management, Thematic analysis, Hermeneutic research, Ethnography, Phenomenology, History, Survey Methodology, Observation, and Focus groups.

Interviews will be conducted with ten officials from the Ubuhlebezwe Local Municipality because the research is qualitative. A sample of ten administrative support staff members was interviewed for this study, which was deemed sufficient due to saturation, as it provided additional information about the research topic and prevented repetition of responses. Furthermore, a sample size of ten is sufficient to rule out the need for quantitative research. When it comes to controlling data and information flow inside an organisation, administrative support employees are essential. This includes organizing files, tracking documents, and ensuring that everyone on the team has access to the necessary data. Their demand for smart technology derives from the fact that they frequently work with technical data management systems and assist project teams with a range of administrative duties (Ocean Virtual Assistant, 2024).

1.9 Chapter Outline

Chapter 1: Introduction

An outline of the research being done was given in Chapter One. The chapter has an introduction, a synopsis of the selected organisation, referred to as the background, the region in which the research will be carried out, the problem statement, the study's goals and objectives, The study's justification, a preliminary evaluation of the literature, the conceptual framework, the research design, and the chapter summary.

Chapter 2: Literature Review

This chapter examines pertinent literature from various researchers on the effects of technological advancements on worker productivity, the difficulties that arise when employees adopt new technologies at work, employee perceptions and attitudes towards these changes, obstacles to the successful adoption of modern technologies by workers, appropriate steps that promote technology development, and the chapter summary.

Chapter 3: Conceptual Framework

The Technological Acceptance Model (TAM), which was applied in this research investigation, is thoroughly illustrated in both the conceptual framework and the chapter summary.

Chapter 4: Research Methodology

This chapter covers the research design and techniques used in this study. The introduction, the study's goal, the research paradigm, the demographic and sample size, the data collection method, the validity and reliability of the data analysis, ethical issues, and the chapter summary are all covered.

Chapter 5: Data Analysis

The data acquired from the semi-structured interviews with Ubuhlebezwe Local Municipality employees is interpreted in this chapter, along with a summary of the chapter.

Chapter 6: Conclusion and Recommendations

This chapter includes the study's summary along with suggestions, conclusions, and closing remarks. Additionally, recommendations for additional study on a related topic are given.

1.10 Chapter Summary

The chapter provided a detailed orientation of the study. The background, problem statement, research objectives, research questions, intended contribution to the body of knowledge, scope, and delimitation of the study (including the scope of subject coverage, literature, and methodology) were all identified and discussed. The next chapter will review the pertinent literature, providing in-depth details that align with the study's goals.

CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

The study's introduction was covered in Chapter One. The literature on how technological changes affect employee performance is discussed in Chapter 2. The Fourth Industrial Revolution (4IR) has brought about technical breakthroughs that government organisations, including municipalities and employees, should embrace. Along with a discussion of the obstacles to workplace technology adoption that might enhance employee performance, a thorough assessment of the degree of technology adoption by government employees will be conducted. Li, Dai, and Cui (2020) claim that in the current Industry 4.0 era, the development and adoption of digital technologies have become a hot topic. Organisations are utilising these cutting-edge technologies to create data-driven strategies, enhance employee performance and skill development, and gain a competitive edge. Anual, Samat, Karim, and Zakaria (2019) argue that employees are urged to fully utilise this chance to enhance their job performance and adapt to these changes, thereby boosting their standard work performance in an age of fast technological development.

2.2 Technological changes

It is challenging to observe, understand, and assess technology, as it is an abstract concept (Baskaran, Lay, Ming, & Mahadi, 2020). It is composed of two basic parts: informational (knowledge in management, marketing, production quality control, dependability, skilled labour, and functional domains) and physical (things, tools, equipment, blueprints, procedures, and processes) (Al-Shameri & Omar, 2022).

Combining and rearranging current information to produce breakthroughs is what propels technological advancement. Businesses' performance is impacted by this technological innovation (Cascio & Montealegre, 2016). An organisation's personnel's talents are the source of its technological breakthroughs. As a result, personnel performance and technical advancement are closely related. Only when workers expertly combine technologies with other resources and use them productively and morally can they increase productivity or improve performance (Duman & Akdemir, 2021).

In support of this argument, Sugiarti (2022) explains that in today's fiercely competitive global economic environment, companies that fail to keep pace with technological advancements risk falling behind their rivals in terms of productivity and competitiveness, which could lead to substantial losses. If a large firm excels in management, finance, and technology, it usually reduces production while earning more money from its ideas, trademarks, experience, and technical advantages. Organisations have different capabilities when it comes to different technologies, which causes noticeable differences among them (Riyanto, Endri & Herlisha, 2021).

According to Martínez-Caro, Cegarra, and Ruiz (2020), technology advances by reorganising and combining information to generate fresh ideas. This rapid development will significantly impact how businesses operate. Internal progress, which results from personnel abilities, can be linked to technological improvements. Employee performance and technical progress are closely related (Alam & Murad, 2020). The ethical and productive use of technology, its integration with other resources by human resources, and its effective usage may all lead to increased productivity or better performance (Singh & Verma, 2019).

2.3 Impact of technological changes on employee performance

It is impossible to overlook the influence of the Coronavirus Pandemic (COVID-19) on technology acceleration and its effects in the workplace while discussing technological growth. The COVID-19 pandemic significantly impacted how our daily lives were conducted. To stop the virus from spreading, new policies, including working from home and social distancing, were implemented. When in-person meetings were not possible, innovations like Zoom meetings and Microsoft Teams were used. Narayanamurthy and Tortorell (2021) claim that the pandemic led to behavioral changes in workers. As a result, line managers, team leaders, and human resource specialists were concerned that these changes would have an impact on their workers' emotional, cognitive, and physical health and, ultimately, their performance and deliverables. According to Davidescu, Apostu, Paul, and Casuneanu (2020), workers play a crucial role in shaping the organisation's human and social capital by providing valuable insights and assistance during its development and operation. Therefore, it is essential to consider their opinions when introducing new technologies to minimize any negative impact on job performance. Governments and organisations alike cannot

ignore the realities of technological advancement in the 4IR era. To attain and enhance employee performance, organisations must proactively involve their workforce by fostering motivation and meeting job satisfaction needs (Sapta, Maufi, & Setini, 2021).

Sapta, Muafi, and Setini (2021) further state that the advancement of technology integrates and rearranges information to produce new ideas, and technological growth will have an influence on the organisation's performance. It should be acknowledged that the advent of digital technology has led to significant changes in how people operate and engage with their surroundings within organisations (Martínez-Caro, Cegarra-Navarro, and Alfonso-Ruiz, 2020). According to Abbas, Muzaffar, Mahmood, Ramzan, and Rizvi (2014), an organisation's capacity to invest in technology leads to greater motivation and staff morale. It also stimulates employees towards innovation. Trenerry, Chng, Wang, Suhaila, Lim, Lu, and Oh (2021) indicate that employers will have to focus more on the well-being of their workforce as organisations undergo digital transformation. Workplace resilience and adaptability are examples of individual factors that are likely to have an impact on the outcomes of digital transformation for both individuals and organisations but have not received enough attention in the context of digital transformation. However, Ioannou, Lycett, and Marshan (2024) argue that employee performance can be negatively impacted by up to 30% due to technostress, which is a result of experiencing technology failure incidents such as errors, breakdowns, disruptions, delays, failed network connections, unexpected shutdowns, and crashes in applications and systems. Since the early 1900s, the world has been experiencing a revolution in information technology (Holmstrom, 2015). Due to the increasing globalisation of markets, many firms are facing increased competition. These companies must thus be able to manufacture customised items of exceptional quality quickly and economically to compete in the export market both domestically and internationally. It is generally accepted that resolving this issue requires the implementation of cutting-edge technologies. Many businesses are adopting technology to boost organisational efficiency and work effectiveness.

There are several advantages to using technology, and businesses can utilize it more effectively. Modernisation, higher productivity, competitiveness, and sustainable growth are all facilitated using contemporary technology. Technology adoption saves energy, reduces resource consumption, is beneficial for the environment, may provide

high economic value, and enhances the company's overall performance (Pham, Pham-Nguyen, Misra, & Damaševičius, 2020).

The impact of technological improvements on employee productivity in the commercial printing industry (Wanza & Nkuraru, 2016). Technology advancements were shown to have an impact on employee performance in several areas, including job redundancy, employee turnover, and workplace motivation. It was found that technological improvements impacted the skills and performance levels of people in this industry. Technology has an impact on employee behavior, performance, interpersonal interactions, working processes, organizational structure, and overall performance (Sulistianingtiyas & Djastuti, 2022). Technological developments can have a detrimental impact on employee stress levels, job satisfaction, and performance, which can lead to mistakes, delays, and wasted time. On the other hand, technology utilizes information to enhance human skills, making previously unattainable jobs feasible or facilitating more efficient task execution. Technology is a growing phenomenon that affects an organization's structures, procedures, and methods; it may also improve employee performance and attitudes (Sulistianingtiyas & Djastuti, 2022). Employee performance plays a significant role in an organization's success (Minh Ha, Luan, & Thanh Khoa, 2021).

Imran, Maqbool, and Shafique (2014) investigated the relationship between technological advancements and employee performance in the banking sector, finding that these advancements have a significant impact on employee motivation and training needs, as well as a strong correlation between technological advancements and employee performance levels. Wanza and Nkuraru (2016) found that due to the rapid changes in technology worldwide, evolving technologies have an impact on employee performance by reducing workloads and increasing efficiency and effectiveness.

When technology is implemented in businesses, it is important to understand how employee productivity and individual performance are affected by its adoption. This is because, as Tusiimemukama (2019) asserts, companies may utilise technology more successfully if the advantages of its adoption are clearly conveyed to staff members and are perceived as worthwhile. Acceptance and adoption are facilitated, which

reduces expenses, enhances operations, improves customer service, and raises overall performance at the organisational and individual levels.

Nohria and Gulati (2016) argue that the use of technology enhances productivity and that job performance and a company's technological skills are positively correlated. For instance, a company can utilize technology such as computers, smartphones, and email, along with easy internet access, to outperform its rivals. It can also maintain contact with current and potential funders, expedite staff interactions, produce high-quality and quantity products that enhance job performance, improve the company's reputation, and establish itself as an employer of choice.

2.4 Employee performance

The practical completion of assigned tasks by an individual or group of employees, as evaluated against established acceptable criteria established by a supervisor or organisation, is known as employee performance. This entails making effective and efficient use of the resources at hand in a dynamic workplace (Tampi, Nabella, & Sari, 2022). According to Sriningsih, Martini, and Nursaid (2022), performance is linked to elements such as output quantity, output quality, punctuality, attendance, and job effectiveness. Through training programs, staff members can quickly learn new material and enhance their existing skills. An employee's level of motivation directly impacts technical advancement within an organisation. Employee performance and technical advancement are closely related. Employee performance inside an organisation may successfully drive and manage technological improvements. In summary, a company's ability to facilitate technical developments and upgrades depends heavily on its workforce, who must be well-trained and driven. The acceptance and efficient use of new technologies are directly made possible by their performance (Riyanto, Endri & Herlisha, 2021). Performance evaluation is the most crucial aspect of employee development within an organisation. Performance evaluation is simply a representation of an employee's performance appraisal form, and it is strongly correlated with the outcomes of an employee's work in an organisation, regardless of the quantity, quality, and timeliness of the work produced (Irfansyah, 2020).

The practice of examining and grading an employee's work is known as a performance evaluation (Murphy, 2020). Additionally, it is often and consistently carried out to enhance career progression, boost employee engagement, and positively affect pay distribution (Vizano, Utami, Johnes, & Herawati, 2021). The primary incentive structure inside an organisation is the pay that workers receive in return for their labour, which can boost employee engagement (Hapsari, Riyanto, & Endri, 2021). When gathering information and statistics on employee achievement, a quantitative and objective method should be used in the performance review process. The only person with the power to conduct the evaluation is the employee's supervisor. The performance evaluation encompasses work plan, execution, coaching, and supervision.

A collaborative approach involving human resources may be an effective way to manage technological development, as human resource performance is closely linked to technological innovation and transformation. Although anyone can innovate and make significant technological advancements, the complexity of modern technology necessitates the skilful fusion of several breakthroughs based on various technological facets (Tampi, Nabella & Sari, 2022). To create new goods, services, and technology, human resources must collaborate, work independently, and combine their ingenuity. Combining one's ingenuity with that of others makes it feasible and meaningful. Despite their differences, individual and group creativity cannot coexist in the manufacturing process unless they are effectively combined and managed to produce the intended result (Sulistyawati & Bahruni, 2021). Additionally, without individual originality, collective invention is impossible. An organization's existence and competitiveness depend on managers creating a cooperative, team-focused work atmosphere that encourages individuals to take the initiative and be creative.

2.5 Positive impact of technological transformation in the workplace

There are many different positive effects of digital transformation on both employees and the workplace. According to Selimović, Pilav-Velić, and Krndž (2021), the digital workplace enhances several employees' competencies, such as their capacity for ongoing learning, prompt response to unanticipated situations, and cooperative problem-solving. Kraus, Jones, Kailer, Weinmann, Chaparro-Banegas, and Roig-Tierno (2021) state that employees can communicate information both inside and across partner organisations without regard to physical location when they

operate in a digital workplace. When employees obtain access to the appropriate information at the right time and follow efficient work processes through technology, they have been shown to waste far less time and corporate resources (Igloo Software, 2019). The performance of employees plays a crucial role in accomplishing the aims and objectives of the organisation (Bolodeoku, Igbinoba, Salau, Chukwudi, & Idia, 2022). The influence of employees' output on an organization's performance can be either positive or negative. According to Riyanto, Endri, and Herlish (2021), companies must actively involve their employees by fostering motivation and ensuring their job satisfaction if they hope to attain and enhance performance. Using technology for communication may lead to reduced face-to-face contact and less practice in reading nonverbal cues (Ruben, Stosic, & Correale, 2021). According to Barao (2023), one benefit of virtual meetings is the unmatched ease and flexibility they provide for participants.

Nearly every aspect of our modern society is changing due to ongoing digital innovation, which makes our lives and jobs more flexible and dynamic (Guo, Yin, & Liu, 2023). When properly implemented or integrated with other resources by human resources, technology can result in higher performance or productivity (Sapta, Muafi, & Setini, 2020). According to Szczurek (2023), work-life balance can be aided or hindered by technology. The benefits of technology include time savings, reduced commuting time and costs, less pollution, increased productivity, and more flexibility. A drawback of technology is that many individuals are constantly connected and so always available. Employers may impose unreasonable reaction times and round-the-clock expectations on their employees, as they are aware of these (Szczurek, 2023).

2.6 Challenges and barriers brought about by technological advancement among employees at the workplace.

Organisations may encounter a variety of difficulties while implementing new technologies, including problems with trust, expertise, and even job displacement. Filipenco (2024) claims that because technology is developing quickly, not everyone can keep up with it. As a result, there is a discrepancy between the abilities that individuals possess and those needed in a modern workplace. Griep, Vranjes, Hooff, Beckers and Geurts (2021) argue that the introduction of new technology in the workplace can be perceived as concerning as it frequently occurs alongside other

developments, some of which have the potential to significantly transform how employees carry out their duties. Adoption of technology is perceived to be hampered by a lack of trust. Leesakul, Oostveen, Eimontaite, Wilson and Hyde (2022) assert that employee mistrust of technology adoption reduces their degree of confidence in innovation. Employees mentioned a lack of tech reliability as the primary cause, citing an increase in workload due to technology (Muller-Heyndyk, 2019). The following problems have also been identified as the main obstacles or difficulties that organisations, enterprises, and corporations face while adopting technology:

- Opposition to change
- Inadequate or non-existent training
- Technostress

2.6.1 Resistance to Change

Tsai, Lin, Chang, Chang and Lee (2022) define resistance to change as a broad opposition to change brought on by the anticipated negative effects of change. According to Hopwood (2021), some employees may be reluctant to move beyond their comfort zone, as they may suffer from technophobia, which is defined as a fear of testing new technologies. Wimelius, Mathiassen, and Holmström (2021) also state that introducing "complex" technologies would undoubtedly affect organisational structures, procedures, and cultures. As a result, employee resistance, motivated by a desire to adhere to established procedures and technology, may impede the implementation of these technologies. Not all employees see the advantages of change in the same way. The adoption of new technology may alter the business culture, necessitating the development of new roles and responsibilities, as well as specialized knowledge to oversee and support specific aspects (Tsai, Lin, Chang, Chang, & Lee, 2022). Internal resistance to new technologies can indicate a conflict of interest between employers and employees. While new technologies can improve a firm's competitiveness in the long run, employees may be hesitant to adopt them due to concerns about their future financial security (Garos, Wang, & Xu, 2020). Overcoming resistance to the multitude of organisational culture procedures intended to enhance effectiveness is another issue recognised as a barrier to change within a company. Naveeda, Alhaidan, Al Halbusi, and Al-Swidi (2022) further note that culture can be either a blessing or a burden in effectively navigating change, depending on

how it facilitates or hinders the transition process. Because they feel they have no stake in the process, are worried that they lack the necessary skills to thrive in the company, or are afraid of losing their jobs, employees will continue to resist digital transformation. Technology anxiety, also known as technophobia, is the overwhelming dread of technology. It has been demonstrated in earlier studies that this fear can result in resistance to change because of ambiguity and unanticipated technological failures (Tsai, Lin, Chang, Chang, & Lee, 2022).

Lack of Training Inadequate or non-existent training. There is inadequate training received from municipalities, which makes the adoption of new technology quite stressful, leading to technostress. Technologies have a significant influence on training and development, facilitating continuous improvement and preparing the workforce for training, which in turn benefits employee productivity and development (Gethe & Hulage, 2024). Adoption of new technology is frequently perceived as a slow-paced or non-existent process; the time necessary to teach staff to utilize new technology, as well as the need for employee buy-in, can all be barriers to learning new systems at work (McGhee, 2022). Hopwood (2021) argues that it is unreasonable to expect staff members to understand how to use newly acquired technology immediately. As a result, setting aside time and funds for training is crucial. According to Hendy (2023), employees with inadequate training are more likely to perform poorly and experience higher levels of work-related stress. Furthermore, workers with inadequate training are prone to feel undervalued at work. Since technology may be used to manage work, people who have received training on it are likely to outperform those who have not (Saleem, Malik, & Qureshi, 2021). Through training, employees can acquire the skills necessary to operate the technology and develop favourable attitudes and opinions about it (Molino, Cortese, & Ghislieri, 2020).

2.6.2 Technostress

Nisafani, Kiely and Mahony (2020) define technostress as any negative impact that technology use has on people's attitudes, actions, and thoughts. According to Saleem, Malik, and Qureshi (2021), technology pressure might be detrimental to employee productivity. Technostress can arise from an organization's need to adopt technology. This type of stress negatively impacts employee performance and has detrimental physical and mental effects (Saleem, Malik, & Qureshi, 2021). Pflügner (2022) argues that employees find it challenging to finish given work duties due to a deluge of

incoming emails and changes in digital reporting tools that sap their energy and contribute to job burnout. According to Hurbean, Dospinescu, Munteanu, and Danaiata (2022), as technology continually evolves and becomes more complex and diverse, employees must possess the necessary digital skills. An employee experiences techno-complexity when they are unable to effectively adapt to these requirements, which makes them feel anxious and frustrated about their lack of understanding. Chang, Zhang, Cai and Guo (2024) state that, technology adoption intention expresses individuals' readiness to embrace and engage with new technologies and largely affects actual adoption behaviour. Further, Chang, Zhang, Cai and Guo (2024) elaborate that, the way employees view the technical requirements related to Artificial Intelligence (AI) is critical. Suppose employees view these requirements as a significant chance for personal development and as something that aligns with their values. In that case, they are more likely to view them as positive work events and classify them as challenging technology stressors, which may encourage workers to take on more initiatives.

2.6.3 Employee perception and attitudes toward these technological changes in the workplace

Government workers are essential to the adoption and use of new technologies in government, and the lasting and significant digital change that they help to create depends on their mindset and level of desire to embrace them (Ahn & Chen, 2022). It's thought that technology will impact many professions and render some obsolete, as computers are becoming increasingly intelligent, creative, and sophisticated (Bhargava, Bester, & Bolton, 2020). According to Johnson, Dey, Nguyen, Groth, Sadhbh, Tan, Glozier, and Harvey (2020), technological advancements have not only altered the employment available to us, but they have also transformed the type of labour that is done. Employment has grown more demanding, intellectually challenging, and service-oriented. Nowadays, a sizable percentage of workers are either in the service industry or as knowledge workers (Johnson, Dey, Nguyen, Groth, Sadhbh, Tan, Glozier, Harvey, 2020). According to Ahn and Chen (2022), a high degree of scepticism and misperceptions may prevent the acceptance and full use of AI technologies, but a positive perspective and knowledge of the new technologies may enable their effective integration and usage. Molino, Cortese, and Ghislieri (2020), further state that employee resistance stems from a variety of factors, including

mistrust, a sense of control, and fear of losing one's job. As a result, new technology implementations frequently fail due to employee resistance and insufficient management of the consequences on other organisational aspects. According to Turyadi, Zulkifli, Tawil, and Ali (2023), digital leadership is essential for managing change, enhancing employee performance, and positively impacting overall corporate success. Guo, Yin, and Liu (2023) state that uncertainty, complexity, and ambiguity define the technical environment in which digital new ventures operate, necessitating significant continuous Research and Development (R&D) activities as well as advancements in digital technology. According to Haddad (1996), employee attitudes toward new technology are likely to be influenced by both the implementation process itself and job positions.

The Technological Acceptance Model (TAM) is used in research to explore the perception and acceptance of e-technology. According to Rulevy and Aprilianti (2020), the five components of TAM are Perceived Usefulness, Intention to Use, Ease of Use, Attitude Towards Use and Actual Use.

2.6.4 Perceived Usefulness

The perceived ease of a technological system and its display are directly linked to each other. According to Davis's (1986) Technology Acceptance Model (TAM), one of the most important aspects in determining a user's acceptance of a system is how easy they believe it to be to use (Tahar, Riyadh, Sofyani, & Purnomo, 2020). Bolodeoku, Igbinoba, Salau, Chukwudi, and Idia (2022) state that to adjust to technology, people must experience psychological adoption, have a better comprehension of technology, and recognize the significance of behavioral control. According to Azmam, Okafor, and Nico (2020), employees are more willing to accept technologies that they believe will improve their performance.

2.6.5 Intention To Use

According to TAM, individuals utilise technology based on two factors: perceived utility and ease of use. An individual's willingness to utilise technology influences their level of usage (Martono, Nurkhin, Murkhibad, Anisykurlillah, & Wolor, 2020). Mailizar, Almanthari, and Maulina (2021) state that the term "behaviour intention" describes a user's motivation for using technology; a user who has a higher behaviour intention

will likely use technology more frequently. Therefore, an employee's intention to utilise technology is influenced by how beneficial they believe the technology to be.

2.6.6 Ease of Use

According to Sancoko, Viendyasari, and Rahmah (2021), the idea of perceived ease of use reveals the degree to which a person feels that using an information system is simple and doesn't involve any effort on their part. Ease of use makes it clear how much work a user believes a system will take to operate or how much they trust a certain technology will be simple to use. Previous studies have established the importance of ease of use in influencing user adoption and IT usage behaviour (Ismail, Aini, Mahmud, & Hasan, 2021).

2.6.7 Attitude Towards Use

Attitude Towards Use is defined by Natasia, Wiranti, and Parastika (2022), as the emotions people experience when engaging in a behaviour. This is a personal judgement of the usage of technology (Alfadda & Mahdi, 2021). According to EduTech (2021), an individual's attitude influences how he uses a system depending on its potential effects on his performance. Thus, even if an employee is not in favour of an information system, there is a good chance he will utilise it if he believes it would help him perform better at work.

2.6.8 Actual Use

The way the system is really used is that users will be happy with it if they find it easy to use and allows for enhanced productivity. This is reflected in the actual circumstances of usage (Natasia, Wiranti, & Parastika, 2022). It is also referred to by Bothma and Mostert (2023), as the degree to which people make use of an information system's capabilities or the amount of time, they spend utilising and engaging with it is known as actual usage.

Figure 2.1 Davis 1986 TAM Model

2.7 Suitable measures that facilitate technology development and improve workers' productivity at the workplace.

Work facilities are crucial for creating a sustainable influence on working life through infrastructural development. The infrastructure created must be used optimally in the long run. Creating a work environment that supports employee productivity is an important aspect of enhancing the profitability of an organisation, corporation, or small business (Putra, Anjanarko, Ernawati, & Masithoh, 2022). According to Miller (2024), regular training is a good way to support the use of technology in the workplace. Employees are encouraged to participate in competitions on occasion to foster healthy competition. They are also encouraged to get rewards and free certificates that can be accessed online on the organisation's server. Scott (2023) also argues that cybersecurity tools aid in safeguarding private data, averting data breaches, and maintaining company operations. Employees can operate more confidently and effectively knowing that their data and the company's assets are safeguarded when they feel safe in their digital workspace. Employee productivity and effectiveness are better in fully equipped offices. It is considered that offices with contemporary office technology maximise efficiency. It is also noted that workplaces with ample, high-quality materials inspire employees to approach their tasks with a more cheerful outlook (Coguric, 2023). Almeida, Santos, and Monteiro (2020) state that implementing innovative technology in organisational operations improves customer satisfaction and expands access to foreign markets.

2.8 Conceptual Framework

Drawing on the detailed insights from the reviewed literature, this section presents the conceptual framework adopted for this study. The Technological Acceptance Model (TAM) is the key conceptual framework used in this study. The conceptual framework of any study is crucial, as it guides the researcher on how to conduct the investigation. The conceptual framework enables the researcher to compare different frameworks developed by other researchers and apply them to their study.

2.9 The Purpose of a Conceptual Framework

According to Varpio, Paradis, Uijtdehaage, and Young (2020), the justification for conducting a specific study is grounded in a conceptual framework. The conceptual framework identifies knowledge gaps about a phenomenon or issue, reports the current state of knowledge, and explains the research project's methodology. The latter two are often accomplished through a literature study. The purpose of its construction is to address two enquiries: "What is the significance of this research?" and "How might these results add to the existing knowledge?"(Varpio, Paradis, Uijtdehaage, & Young, 2020). The conceptual framework must guide us toward the actual opportunities and challenges that arise from employing contemporary technology to directly assist individuals in understanding complex circumstances, identifying key variables, and resolving issues (Engelbart, 2023). According to Adom, Hussein, and Adu-Agyem (2018), the conceptual framework helps the researcher define and develop their perspective on the study. This is the most straightforward method a researcher may use to convey the solutions they believe would solve the issue they have identified. Adom, Hussein, and Adu-Agyem (2018) further state that the significance of a research issue, the researcher's presumptions, the scholars with whom the researcher agrees and disagrees, and the intellectual underpinnings of the researcher's methodology are all highlighted. When current theories are insufficient or not suitable for providing a solid foundation for the inquiry, researchers typically turn to a conceptual framework.

2.10 Advantages of a conceptual framework

According to Horowitz (2019), conceptual frameworks can be used in experimental research to achieve the following:

- To identify priority research domains and provide guidance for making intervention decisions.
- Assists in determining outcomes and factors to measure, which enables researchers to develop and test hypotheses.
- Conceptual frameworks show how factors relate to one another, offering a thorough understanding of the research topic.
- Help organize and structure the research, providing a clear framework for conducting the study.
- Help integrate various research components and theories, enabling a more comprehensive approach to the research.

All in all, the use of conceptual frameworks in experimental research improves the study's clarity, organisation, and comprehensiveness, resulting in more effective and significant research outcomes.

2.11 Limitations of a conceptual framework

As with advantages, according to Aransiola (2023), the conceptual framework in research also has the following limitations:

- Theoretical gaps - This occurs when conceptual researchers are not fully aware of the existing body of knowledge related to their subjects. Data from the researchers' work is misinterpreted when a field is not well-versed in.
- Problems gathering data - Here is where conceptual researchers often encounter difficulties gathering data, as they typically lack access to the same funding and resources as other types of researchers.
- Low levels of involvement - It has been shown that conceptual research, which frequently takes longer than other types of study, entails producing new information via careful analysis rather than empiricism. This may account for the low levels of engagement.

2.12 Constructs of a Conceptual Framework

The Global Graduate Network (2021), states that a conceptual framework is guided by the following aspects:

- A conceptual framework is a construct in which every notion is essential, not just a list of concepts.
- It offers an interpretive framework for social reality as opposed to a causal or analytical one.
- Conceptual frameworks give comprehension instead of a theoretical explanation, as do quantitative models.
- It is more knowledgeable about "soft interpretation of intentions" than "hard facts."
- The indeterminist character of conceptual frameworks prevents us from making predictions about the future.
- Through the use of qualitative analysis, conceptual frameworks may be created and formed.
- Several discipline-focused theories make up the data sources, which provide the empirical information for the conceptual framework study. While theoretical analysis based on conceptual frameworks is produced by multidisciplinary bodies of knowledge, meta-synthesis—a methodical synthesis of findings from qualitative studies—aims to produce novel interpretations that are widely accepted in each field of inquiry.

The relationships between the various investigational components should be outlined in a conceptual framework. These connections should guide the researcher's approach to the investigation and inform the types of data that should be gathered and processed. The researcher can defend the significance of the study and the rigorousness of the research design by clearly outlining the relationships between the concepts (Luft, Jeong, Idsardi, & Gardner, 2022).

2.13 The Technological Acceptance Model (TAM)

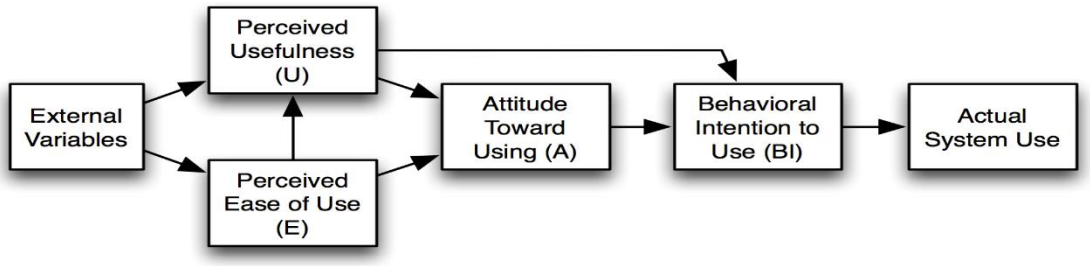

Figure 2.2 The Technological Acceptance Model

Source: Davis, Bagozzi, Warshaw (1989)

Marikyan and Papagiannidis (2023) state that the Technological Acceptance Model's (TAM) main objective is to shed light on the mechanisms behind technology adoption to forecast technological behaviour and offer a theoretical justification for its effective use. TAM's practical goal is to enlighten practitioners about potential precautions to take before implementing systems. Several actions were taken to meet the theory's goals. According to Kowalska-Pyzalska (2024), the original TAM evaluated the effects of four internal factors on current technology usage, therefore it should be possible to forecast future technology utilisation by applying the TAM whenever a new technology is introduced. The four factors included:

- Perceived Ease of Use (PEU) - The degree to which consumers think they will need no effort to operate a certain technology is known as ease of use. Put another way, people are more interested in utilising a system that they perceive to be easy to use (Tahar, Riyadh, Sofyani, & Purnomo, 2020).
- Perceived Usefulness (PU) - Yudiarti and Puspaningrum (2022) state that PU is the extent to which an individual believes that utilising a specific system would enhance its functionality.
- Attitude Toward Use (ATU) - The degree to which an individual believes that technology use is either beneficial or detrimental (Zaineldeen, Hongbo, Koffi, & Hassan, 2020).
- Behavioural Intention to Use (BI) - The degree to which people are prepared to continue using new technology is defined as their behavioural intention to use (Peng & Yan, 2022).

With the sophisticated and dynamic expansion of technologies, the rate at which employees/customers embrace new technologies is determined by a variety of criteria, including technological availability, convenience, consumer demand, security, and others (Lai, 2017). According to Marikyan and Papagiannidis (2023), to forecast technology's behaviour and offer a theoretical justification for its successful use, TAM's main goal was to illuminate the mechanisms behind technology adoption. TAM's practical goal was to enlighten practitioners about potential precautions before implementing systems. The TAM theory states that human behavioural goals to include a certain technology impact practical human usage of that technology; behavioural intents, in other words, dictate the technology's actual use (Kelly & Palaniappan, 2023). According to Ramayah and Muhamad (2014), Perceived use and perceived ease of use are two perceptions that influence an individual's behavioural intention to embrace a technological system or innovation, according to TAM theory. It has been shown that there is a connection between users' attitudes and intentions to employ technology and their perceptions about its utility. Ramayah and Muhamad (2014) further state that compared to other factors described in the literature, perceived usefulness showed a greater and more consistent connection with utilisation. Even if people dislike using technology, they may embrace it if they believe it to be practical, beneficial, and socially significant. Therefore, a direct correlation may exist between beliefs and intentions. Moreover, it is proposed that external factors influence perceived use and convenience of use.

External Variables – These are factors, such as the COVID-19 pandemic and the 4th industrial revolution, that would cause the Municipality to introduce new technological innovations to colleagues as an efficient and effective way of working.

Perceived Usefulness – This refers to how employees at Ubuhlebezwe Local Municipality perceive the introduction of new technological innovations as useful to their work.

Perceived Ease of Use – This refers to how employees at the Ubuhlebezwe Local Municipality perceive the introduction of technology as easy to use.

Attitude Towards Use – This refers to the positive or negative attitude that employees have toward technological advancements being introduced to the Municipality.

Behavioural Intention to Use – This is where office culture comes into play, where employees' behaviour towards the impact of technological changes in the Municipality is seen as a way to disrupt their traditional ways of working. This can lead to colleagues ganging up to boycott the changes, or they can be receptive towards the technology and work together to help each other better understand it.

Actual Use – This refers to the actual level at which Ubuhlebezwe Local Municipality employees are adopting and utilizing the technology introduced by the Municipality to become an efficient and effective Entity.

2.14 Complimenting the TAM with The Diffusion of Innovation

The Diffusion of Innovation refers to the process by which individuals embrace a novel concept, item, method, or ideology. Everett Rogers, who popularized the model, outlined this procedure and emphasized that, typically, a small number of people are receptive to new concepts and embrace their application (Kaminski, 2011). For a more comprehensive knowledge of the elements influencing the "external variables" in the TAM model, the Diffusion of Innovation Theory might be helpful. According to Milbank (2004), Everett Rogers highlighted several traits of an innovation that have a direct bearing on how helpful and simple a person finds it to be:

Relative Advantage: Innovations are more likely to be viewed as beneficial when they have a definite relative advantage. When a new technology offers notable advantages over current approaches, people are more likely to believe it will enhance their performance.

Compatibility: Because these technologies integrate into the existing workflow and require fewer substantial behavioral adjustments, they are often perceived as more user-friendly and beneficial when they are compatible with the infrastructure, beliefs, and habits already in place.

Complexity: PEOU may suffer from highly complex technology being viewed as challenging to use. Users are more likely to accept simpler technologies because they perceive them as less intimidating.

Trialability: A technology's perceived utility (enabling people to see possible advantages) and convenience of use (reducing uncertainty and providing hands-on experience) can both be enhanced by trialability.

Observability: A technology can have a beneficial impact on a person's opinion of its utility when its advantages are apparent to others. Seeing friends or coworkers use a technology well might boost confidence in its possibilities.

Essentially, the Diffusion of Innovation Theory's description of an innovation's traits can serve as precursors to the two TAM constructs—perceived usefulness and perceived ease of use. Comprehending these innovative traits may aid in forecasting and elucidating the reasons behind people's views of a technology, which in turn affects their adoption and the pace at which the technology spreads across a social structure. To gain a more comprehensive understanding of technology adoption, these two models can be combined. They may, for example, examine how the perception of a new software's relative advantage (a Diffusion of Innovation concept) among Ubuhlebezwe Local Municipality employees influences their perception of the software's usefulness (a TAM concept), which in turn affects their intention to use it. Compared to either theory alone, this integrated viewpoint offers a more thorough account of the adoption process.

2.15 Conceptual Underpin for the Research

This study made use of the Technological Acceptance Model (TAM). Staff members at Ubuhlebezwe Local Municipality stand to gain much from utilising technology, as it may enhance productivity, transparency, communication, and quality of services. Glyptis, Christofi, Vrontis, Del Giudice, Dimit, and Michael (2020) state that, to improve efficiency, effectiveness, accountability, and openness as well as communication and stakeholder access to information, the public sector must be reformed and transformed into a digital public sector. For countries to be competitive in the globalised world of the twenty-first century, they must fully utilise e-government. By using the TAM, the goal was to find out if technology had a good or detrimental impact on the ways that employees at the Ubuhlebezwe Local Municipality worked.

To investigate the extent to which technology has impacted the Ubuhlebezwe Local Municipality, semi-structured interviews were employed in the research study. The

TAM provided support for this research inquiry, and the six variables that make up the model helped construct the study questions for the semi-structured interviews. Within the framework of this research study, the COVID-19 pandemic is highlighted as a catalyst for digital transformation, which aligns with the model's description of the factors that influence corporate change. Every nation's social, environmental, and economic metrics have been put under strain by the COVID-19 pandemic, which has also raised questions about how well countries can continue to progress and be sustainable (Ullah, Pinglu, Ullah, & Abbas, 2020). According to Chen, Lin, Chen, Chao, and Pandia (2021), it is impossible to resist embracing digital change. The issues of urbanisation and internationalisation of economic activity need an organisation to adapt. Chen, Lin, Chen, Chao, and Pandia (2021) further state that by combining their operations with a new digital environment, organisations need to modernise. Through the process of digital transformation, organisations may create solutions for difficult issues.

2.16 Chapter Summary

In addition to providing infrastructure and services, municipalities also strive to promote the social and economic development of their local communities. The sustainability and environmental friendliness of municipal services are also the responsibility of municipalities. Municipal technology facilitates the enhancement of service delivery, financial management, and criminal investigation. It can also aid municipalities in their transition to smart cities. Considering this, the literature examined potential obstacles that may be overcome when the municipality adopts technology. The TAM model also helped to underline that a municipality's attitude towards technology use may define how that technology is adopted throughout the community.

CHAPTER 3 – RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the strategy or general procedure for obtaining information that is used to answer a question. Key elements, such as research design, data collection procedures, and analysis methods, are discussed in such protocols (Sreekumar, 2023). It is essentially a primer that outlines the methods and how to achieve results in the specific area of interest in the eyes of researchers (Sreekumar, 2023; Muhaise et al., 2020). For students and aspiring researchers, learning research methodology is crucial. It provides an overview of various research paradigms and philosophical perspectives. This knowledge equips them with the capacity to build strong research proposals and broaden their interdisciplinary methodological competencies (Verma, Verma, & Abhishek, 2024). The research methodology used in this study is explained in this chapter, which includes the research design and approach, as well as the techniques employed. It articulates the reasons for the methods used and how these assisted in securing the credibility, trustworthiness, and ethical soundness of the research.

3.2 Research Philosophy

According to Tamminen and Poucher (2020), a research philosophy is a set of fundamental ideas that guide the design and implementation of a research project. Various research philosophies offer distinct perspectives on scientific research. Research may be associated with several research ideas; the five main ideologies are Pragmatism, Postmodernism, Interpretivism, Positivism, and Critical Realism (Muhaise, Ejiri, Muwanga-Zake, & Kareyo, 2020).

3.2.1 Pragmatism

Concepts are only important when they facilitate action, according to pragmatic theory. It seeks to balance subjectivism with objectivism, values and facts, precise and thorough information, and many contextualised experiences. It does this by considering theories, concepts, ideas, hypotheses, and research findings concerning

their functions as tools of cognition and action as well as their applicability in particular situations, rather than in an abstract manner (Muhaise, Ejiri, Muwanga-Zake, & Kareyo, 2020). Pragmatism's emphasis on producing actionable information is especially beneficial for research with non-governmental organisations. It ensures that research is both contextually relevant and theoretically informed (Kelly & Cordeiro, 2020).

3.2.2 Postmodernism

According to Muhaise, Ejiri, Muwanga-Zake, and Kareyo (2020), Postmodernism places a strong focus on language and power dynamics to challenge conventional wisdom and give voice to marginalised and alternative viewpoints. It has historical ties to the post-structuralist academic movement. Postmodernism is an umbrella term for a group of interconnected theories, methods, frameworks, and viewpoints that approach practice and thought from a critical and sceptical angle (Ellaway, 2020).

3.2.3 Interpretivism

Interpretivism highlights the fact that because people are interpreters of meaning, they vary from physical occurrences (Muhaise, Ejiri, Muwanga-Zake, & Kareyo, 2020). Since social science and scientific research belong to distinct fields of study, interpretivism opposes the use of scientific research instruments and methodologies in social science (Ali, Shah, & Shah, 2021).

3.2.4 Positivism

Muhaise, Ejiri, Muwanga-Zake, and Kareyo (2020) state that, in positivism, low-level generalisations are made by dealing with observable social reality, and this is related to the philosophical position of the natural scientist. Positivism emphasizes the researcher's impartiality in measuring any social fact or phenomenon, as well as its reproducibility (Ali, Shah, & Shah, 2021).

3.2.5 Critical Realism

Critical Realism seeks to explain what is seen and felt in terms of the underlying realities that drive visible occurrences (Muhaise, Ejiri, Muwanga-Zake, & Kareyo, 2020). According to Zhang (2022), the goal of critical realism is to provide a useful counterbalance to constructivism, postmodernism, and certain hermeneutical perspectives, as well as the positivist empiricist paradigm.

3.2.6 Key Philosophical Considerations in Qualitative Research

In qualitative research, ontology (the nature of reality), epistemology (the process of acquiring knowledge), axiology (the function of values), and Phenomenology (the techniques employed) are important philosophical factors. Research objectives, data collecting strategies, and data analysis approaches are all influenced by these philosophical positions, which also affect the reliability and interpretation of results.

Ontology: According to Moon and Blackman (2017), when it comes to the nature and existence of the items being studied, ontology helps researchers understand how confident they can be. What "truth claims," for example, may a researcher make about reality? Who determines what is considered "real"? How can scholars resolve divergent and contradictory conceptions of reality?

Epistemology: Epistemology is a philosophical field that examines the theory of knowing. The philosophy's fundamental focus is on understanding the nature of knowing (Heng & Sol, 2022).

Axiology: Axiology is the underlying concept employed in values-based education because it bridges the gap between values viewed as objective or subjective realities. Axiology is founded on a value postulate that focuses on what is good and drives us to see acts and ideas as having good and bad making attributes (Edelheim, et al., 2022).

Phenomenology: Understanding people's lived experiences within a particular event is the main goal of phenomenology. Instead of putting theories to the test or extrapolating results, it seeks to capture the spirit of that event, (McLeod, 2024).

The investigation's philosophical perspective, chosen by the researcher, is pragmatism. According to Kaushik and Walsh (2019), pragmatism is a research paradigm that is predicated on the notion that researchers should employ the most appropriate philosophical and/or methodological approach for a particular research topic. Simpson and Hond (2022) claim that pragmatism is distinct because it demonstrates a commitment to process and emergence, provides a naturalistic and experimental approach to knowing, and shows an understanding that the anticipated effects in the future determine the importance of actions taken in the present. This

study employs a pragmatic research philosophy. Pragmatism is adaptable when it comes to methodology. It provides researchers with the option to select among mixed, qualitative, and quantitative methodologies. Additionally, the research demonstrated the consequences of ‘The exploration of technological advancement changes on employee optimal performance: A case of Ubuhlebezwe Local Municipality,’ one of the pragmatist views pertinent to this study. Lindberg (2020) argues that consequences are important knowledge indicators because they make the "meaning" or "utility" of an action very evident. One of the key assumptions of pragmatic philosophy, according to Kaushik and Walsh (2019), is that human acts and ideas have meaning that depends on how they are perceived.

3.3 Research Methods

Research is described by Western Sydney University (2023) as both the creation of new knowledge and the innovative use of pre-existing information to provide novel ideas, approaches, and comprehension. This can include synthesizing and analysing earlier research to the extent that it produces original and inventive results. According to Song (2021), it is possible to understand research as involving two things:

(i) Objectifying what you do to contribute to your chosen area (or community) and

(ii) Connecting what has been done with what needs to be done to develop new knowledge.

Sileyew (2019) claims that methodology outlines the process by which researchers create their challenges and objectives and provide the data collected throughout the study period as outcomes. The methodology features a demonstration of how the research outcome will be achieved in relation to the study's objectives (Sileyew, 2019). Research often employs qualitative or quantitative approaches, and mixed methods are used when the researcher seeks to consider multiple perspectives. The methods sections often address two primary questions, which are as follows:

a) How were the data produced or gathered?
b) How was the information examined?

3.3.1 Qualitative Research Methods

According to Nassaji (2020), Qualitative research may be roughly described as a naturalistic approach to non-numerical data. Its goal is to comprehend and explore rather than to explain and manage factors. It is contextualised and interpretative, focusing on the developmental process rather than the study output or outcome. Understanding meaning is the goal of qualitative research, and words and observations are the data that need to be evaluated (Adler, 2022).

3.3.2 Quantitative Research Methods

Large sample sizes, statistical analysis, and a focus on numerical data define quantitative research, which is essential to fields like public health, psychology, and economics. Researchers can quantify links, patterns, and trends within populations thanks to its organised and objective character, which provides insightful information that supports evidence-based decision-making (Dehalwar & Sharma, 2023). According to Collier, Seawright, and Brady, (2023), thick analysis is frequently used in qualitative research, meaning that researchers heavily rely on in-depth case knowledge. Some academics believe that the most crucial instrument in the qualitative tradition is thick analysis.

3.3.3 Mixed methods

Kimmons (2022) states that any research strategy that makes use of any combination of qualitative and quantitative data is referred to as mixed methods. But the word "mixed methods" is quite general, and it doesn't help researchers comprehend how to combine qualitative and quantitative methods and data or even walk them through particular research procedures. Approaching complicated research problems using a mixed-methods design has several advantages since it combines the theoretical frameworks of post-positivism and interpretivism, fusing qualitative and quantitative data to provide a coherent explanation of the research questions (Saraswati, Shrestha, & Giri, 2021).

The methodology selected for this research study on ‘The exploration of technological advancement changes on employee optimal performance: A case of Ubuhlebezwe Local Municipality’ was qualitative, which focused on examining and gathering a range of empirical material such as case studies, first-hand accounts, reflections, life stories, interviews, and artefacts. Qualitative data were collected from ten administrative

employees at Ubuhlebezwe Local Municipality who functioned as the participants in this study using semi-structured interviews. Selecting ten administrative staff members from the municipality helped the study approach saturation without becoming repetitive, and it assured that the data obtained was sufficient to answer the research question and corroborate the conclusions. This also helped to reduce redundant data collecting, allowing researchers to focus on in-depth analysis and interpretation. Plano-Clark (2019) further asserts that qualitative research provides researchers with the opportunity to utilize their entire toolkit of techniques and procedures to generate novel concepts and understandings in response to their research questions. Semi-structured interviews have been selected as the qualitative approach to be employed in this research project. According to Busetto, Wick, and Gumbinger (2020), interviews are used to gain a deeper understanding of a person's subjective experiences, opinions, and motivations rather than facts or behaviors. DeJonckheere and Vaughn (2019) elucidate that the primary aim of semi-structured interviews as a means of gathering data is to get information from key informants who possess first-hand experiences, attitudes, opinions, and beliefs about the subject matter under investigation.

3.4 Research Questions

The following questions emanate from the objectives above. These questions were used to formulate the research questionnaire.

a) What are the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality?
b) What are employees' attitudes and views towards technological advancements at Ubuhlebezwe Local Municipality?
c) What measures can be suggested to facilitate technology progress and improve workers' productivity in Ubuhlebezwe Local Municipality?

3.5 Population

Alternatively referred to as the target population, the research population is the complete group or collection of people, things, or events that the researcher is

interested in and that have particular qualities. It is an image of the broader population that is used to draw a sample (Thomas, 2023). Here are some significant population categories that are discussed and defined by Shukla (2020):

a) **Finite and Infinite Population**

   A population is referred to as Finite if its units are countable and have a finite quantity. An Infinite Population refers to a population whose units are uncountable and whose number is unlimited.

b) **Homogeneous and Heterogeneous Population**

   A population is referred to as Homogenous if every unit in it shares the same or a comparable trait. This type of population is more common in fundamental and pure research than in social science, education, or psychology. The term Heterogeneous Population refers to a group of people whose constituent units differ either entirely or somewhat from one another.

c) **Existent and Hypothetical Population**

   A population is considered to be in Existence if its units are physical entities. In the majority of situations, finite and existing populations may be thought of as alternatives to one another. The term Hypothetical Population refers to a population whose members are supposed to exist or whose likelihood of existing is determined by statistical methods but whose actual presence is not known.

d) **Known and Unknown Population**

   The term "Known Population" refers to a population whose parameters are known, while the term "Unknown Population" refers to a population with unknown or difficult-to-determine parameters.

According to the Municipalities of South Africa, (2024), the administrative division of KwaZulu-Natal consists of ten district municipalities, forty-three local municipalities, and one metropolitan municipality which is eThekwini Metropolitan Municipality. In the province of KwaZulu-Natal, the Ubuhlebezwe Local Municipality is classified as a Category B municipality. Out of all the four municipalities in the district, it is the smallest. The municipality's principal administrative hub is the town of Ixopo, which is

situated about eighty-five kilometres southeast of KwaZulu-Natal's capital, Pietermaritzburg (Municipalities of South Africa, (2024). As per the KwaZulu-Natal Integrated Rural Development Policy, certain nodes for secondary development have been designated (Department of Agriculture, Land Reform & Rural Development, 2023). Approximately 113,032 people live in the Ubuhlebezwe Local Municipality, with more than half of them living in rural regions. The Ubuhlebezwe Local Municipality currently has 263 approved positions and fourteen vacancies. Mining, manufacturing, construction, utilities, business services, travel and tourism, and agriculture are the main economic drivers in the Ubuhlebezwe Local Municipality region. Ubuhlebezwe is a social and economic functioning unit in addition to being an administrative and local government structure. Identification of strategically placed communities that will be the target of future commercial and residential growth, administrative tasks, and government and municipal services is the goal of secondary development nodes, hence this Municipality was selected.

3.6 Sampling

The technique of taking a pre-set number of observations from a larger population is known as sampling in statistical analysis. Through the use of a tiny sample of the population, researchers may perform studies regarding a huge group (Tuovila, 2024). In research, two main categories of sampling techniques are available for use:

a) **Probability sampling**, which is selected at random, may draw robust statistical conclusions about the entire group.
b) **Non-probability sampling** makes data collection easier by selecting individuals non-randomly based on convenience or other factors.

For this research study, non-probability sampling was selected. According to Stratton (2021), non-probability sampling methods are less objective than probability techniques, as they do not require all members of a target population to participate in a study. Instead, participants are chosen by the researcher, referred to them, or self-select. In non-probability sampling, a technique known as convenience sampling was employed to conduct this research. To obtain a convenience sample, one needs only select those persons who are most readily available to the researcher and who may

be able to provide the necessary information. This is a simple and affordable method for collecting preliminary data; however, it is not possible to determine whether the results can be generalized, as the sample is not representative of the population (Mweshi & Sakyi, 2020).

Interviews were conducted with ten administrative support staff members from different Departments within the Municipality including, Office of the Municipal Manager, Infrastructure and Development Planning, Cooperate services, Budget and Treasury Office, The Community and Social Services Department on the subject of "The exploration of technological advancement changes on employee optimal performance: A case of Ubuhlebezwe Local Municipality." Selecting ten administrative staff members at the municipality assisted the research in reaching saturation without repetition. It ensured that the data collected were sufficient to address the research question and support the findings. This also helped avoid unnecessary data collection, allowing researchers to focus on in-depth analysis and interpretation. Furthermore, qualitative research may still be conducted with a sample size of ten. Administrative support staff play a crucial role in managing the flow of data and information inside a business. This entails organising files, monitoring papers, and ensuring that all team members have access to the information they need. Because they often interact with technological data management systems and assist project teams with various administrative tasks, they have a high need for smart technology (Ocean Virtual Assistant, 2024).

3.7 Demographic Profiling

Demographic profiling, as described by Madigan (2017), is the process of collecting and examining data on a population or sample to understand its composition and characteristics. This data enables researchers to characterize study participants, identify any biases, and assess the generalizability of their results. Demographic information can be used as an independent variable in the study design and is often included in the methodology section of research reports. The Demographic Information of the participants who were interviewed at the Ubuhlebezwe Local Municipality were tabulated under the following table:

DEMOGRAPHIC PROFILLING

Gender	Portfolio held at the Municipality	Department employed to within the Municipality	Academic Credentials
Female	Community and Social Services	Community and Social Services	Post Graduate Diploma in Community Development. Bachelor's degree in business administration.
Male	Corporate Services	Human Resources	Master's in human resources
Female	Executive and Municipal Managers Office	IDP and Performance Management	Bachelor of Social Science
Female	Executive and Municipal Managers Office	Internal Audit	Degree in Internal Audit
Female	Budget and Treasury Office	Budget and Treasury	Bachelor of Commerce in Accounting
Female	Infrastructure Planning and Development	Housing and Planning	Degree in Town and Regional Planning
Female	Community and Social Services	Community Development	Master's in agriculture majoring in food security. Post Grad Diploma in Food Security Bachelor of Social Science majoring in Community Development
Male	Community and Social Services	Community Services	National Diploma: Agriculture
Male	Community and Social Services	Local Economic Development and Tourism	Master of Commerce in Local Economic Development (MCom LED)
Male	Community and Social Services	Community Safety	Post Graduate Diploma in Public Administration

Table 1 Demographic Profiling

3.8 Data Collection Instrument

Data collection is the process of obtaining and examining precise information from various sources to assess potential outcomes, trends, and probabilities, among other research concerns (Simplilearn, 2023). Experiments, direct observation, questionnaires, surveys, interviews, tests, a study of the literature already in publication, and data from archives are some of the methods used to acquire data. The approach chosen for the research will determine the process of selecting an instrument to gather data. Neha (2021) states that interviews are more helpful in

gaining a broader understanding of how and why certain things happen, as well as the opinions, motivations, interests, and feelings of the people involved. For this research study, the researcher employed semi-structured interviews as a data collection method, as the research methodology is qualitative. Neha (2021) argues that interviews are a potent tool for gathering data and should not be disregarded when choosing a data-collecting method. George (2022) defines a semi-structured interview as a data collection technique that centres around posing questions within a predefined theme framework. Additionally, semi-structured interviews are a qualitative research method typically employed in social sciences as an exploratory instrument (George, 2022).

3.8.1 Primary Data

Primary data refers to data obtained for the first time and is unique and fresh. In experimental research, primary data is acquired during the experiments; however, in descriptive-type research and surveys, primary data is gained either through observation or direct conversation with Participants in one way or another (Mazhar, Anjum, Anwar, & Khan, 2021). Primary data can only be gathered through research methods such as interviews, questionnaires, focus group discussions, and observation. Only by using common sense can one determine which tool to use for data gathering, considering the type of data (Mwita, 2022).

3.8.2 Secondary Data

According to Tripathy (2013), secondary analysis refers to using existing research data to answer a question that differs from the original study's purpose. Secondary data can be gathered as part of personal research or large-scale surveys. Secondary data investigators, like primary data researchers, must be informed about their study topic to select datasets suitable for secondary data analysis.

3.9 Data Analysis and Presentation

Ningi (2022) asserts that gathering data is a crucial instrument for comprehending, conducting, and presenting the results of qualitative research. Additionally, information from the qualitative study is presented in the form of descriptions, interpretations, and narratives derived from participant responses. The researcher will need to type field

notes and transcripts, sort and identify major themes through the raw data transcription, code the findings, interpret the data by projecting the views descriptively, and validate the data collected through peer examinations and member checking, which are mechanisms used to validate data. These are the steps the researcher must follow to analyse and interpret data (Ningi, 2022).

For this research project, qualitative data were gathered. The researcher conducted interviews to enable the qualitative data to be analyzed using a thematic analysis. The researcher initially familiarised herself with the data gathered from the interviews using theme analysis. The researcher coded the data by emphasising key passages from the interviews and created crucial abbreviations. After creating themes from the shorthand labels, the researcher examined these topics to make sure the data were accurately represented. The most pertinent basic themes were followed by sub-themes derived from these themes, which contained more specialized issues, and were then analyzed.

The researcher must be reliable when gathering and analyzing qualitative data. For this research study to be deemed reliable, the researcher had to show that it had been carried out in a precise, consistent, and thorough manner by recording interviews, systematising, and disclosing analysis methods in a way that provided enough information for the reader to assess the process's credibility (Norris, White, & Moules, 2017).

3.10 Ethical Considerations

Ethical metrics in research, according to Neuman (2014), ensure that the researcher upholds their professional and ethical commitments even when participants are not aware of them. This study adhered to the guidelines set out by the University of KwaZulu-Natal's ethical policy. A note detailing the purpose of the survey will be sent to Participants. Participants signed a consent document. The primary benefit of following ethical guidelines is that it increases the likelihood of obtaining accurate data. Furthermore, voluntary participation increased the probability of receiving honest responses. Participants were informed of their freedom to submit blank surveys or to discontinue participation at any time. Creswell (2014) emphasises the importance of protecting Participants' confidentiality and anonymity during the data-gathering

process. To ensure that this happens, the researcher will maintain the confidentiality of the data collected and will not need the responders' identities. Participants are free to share their sincere opinions without fear of repercussions because their identities are hidden from view.

3.10.1 Validity and Reliability

Sürücü and Maslakci (2020) define validity as a concept or a measuring tool that accurately measures what it is supposed to measure. These indicators can be improved by careful sampling, the use of the right equipment, and statistical analysis of the data. A pilot research project is a constrained feasibility study designed to test some of the strategies intended for a larger, more thorough, or confirmatory inquiry. Pilot studies are not intended to prevent researchers from conducting large-scale investigations; instead, they aim to address specific research problems when researchers lack adequate expertise in the methodologies they employ (Teresi, Yu, Stewart, & Hays, 2022).

Reliability, according to Basuo and Don-Solomon (2018), refers to the degree to which tests can be repeated when individuals assess the same idea or skill using various instruments and under different circumstances. In this study, Cronbach's alpha will be employed to evaluate the reliability of the measurement apparatus. When internal consistency dependability is adequate, the Cronbach's alpha coefficient is higher than 0.7. To demonstrate that the scales and tests developed or utilized for the study are suitable for the job at hand, researchers commonly employ Cronbach's alpha statistics (Taber, 2018).

3.10.2 Hallmarks of Trustworthiness and the associate components of: Credibility, Transferability, Dependability, and Confirmability

Hlongwane (2020) asserts that the veracity of the results hinges on how well they capture the participant's experiences from their own point of view. Trochim (2016) argues that research loses its usefulness if data is fabricated, conclusions are interpreted incorrectly, or both. The four components of trustworthiness that Saunders, Lewis, and Thornhill (2019) listed are confirmability, dependability, credibility, and transferability.

3.10.3 Credibility

According to Saunders, Lewis and Thornhill (2019), credibility is no more complicated than "the participants agree that the results are true and believable." Participants will get emails requesting them to verify the accuracy of the data after it has been collected for this project.

3.10.4 Transferability

Harding, Golin, Welgus, Lightfoot, Harding, and Riggins (2020) define "transferability" as the degree to which the findings may be used or extrapolated to different contexts or circumstances. To enable others to replicate and pursue this study, the investigator will furnish a comprehensive account of the process used to collect and evaluate data.

3.10.5 Dependability

To be dependable, a researcher must take responsibility for the dynamic environment in which their work is conducted (Harding et al., 2020). This implies that the researcher has to notify the audience of any alterations made to the surroundings and explain how such alterations could affect the results. Trochim (2016) asserts that ethical standards are "the main guidelines since the participants need to be respected throughout the process." To accomplish its objectives, this research will gather, analyse, and interpret data.

3.10.6 Confirmability

According to Trochim (2016), this is the extent to which results can be independently verified. Once the study is complete, the reader can evaluate the procedures followed in the data collection and analysis to see if bias or distortion may have occurred. This is only possible if the process is carried out consistently to assess the results.

3.11 Chapter Summary

This chapter of the study discussed the researcher's methodical procedure for conducting the investigation and gathering information to answer the research

question. It defined the processes utilized to gather, handle, and evaluate data, thereby assuring the study's validity and reliability.

CHAPTER 4 – FINDINGS, DISCUSSION, AND ANALYSIS

4.1 Introduction

This chapter aims to convey the interview findings, which provide light on the study's primary goal. According to Mezmir (2020), qualitative data analysis is the process of converting unprocessed data by looking for, assessing, identifying, categorising, coding, mapping, investigating, and characterising patterns, trends, and themes to comprehend and reveal their underlying meanings.

Ten (10) municipal employees from the Ubuhlebezwe Local Municipality were purposefully chosen to participate in the study, representing the following departments: Executive and Municipal Managers Office, IDP and Performance Management, Corporate Services, Human Resources, Social Development, Budget and Treasury, Infrastructure and Planning, Community and Social Services, and Local Economic Development (LED) & Tourism. The employees who participated in the interviews were referred to as Participant 1, Participant 2, Participant 3, Participant 4, Participant 5, Participant 6, Participant 7, Participant 8, Participant 9, and Participant 10.

The results of the interviews conducted were analysed using thematic analysis, and the following themes and sub-themes from the research study's objectives emerged:

4.2 Objective 1: Examining the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality.	**4.3 Objective 2: Evaluating Ubuhlebezwe Local Municipality employees' attitudes and views of these technological advancements, as well as any obstacles they may be facing.**	**4.4 Objective 3: Determining measures that can facilitate technology development and improve workers' productivity in Ubuhlebezwe Local Municipality.**
4.2.1 Work Satisfaction	4.3.1 Effects of technology on work duties	4.4.1 Technological Infrastructure
4.2.2 Significant Technological Changes	4.3.2 Job Security	4.4.2 User-friendly Technology
4.2.3 Stakeholder Interaction	4.3.3 Adjusting to Technology	4.4.3 Increased Productivity
4.2.4 Work-life balance	4.3.4. Training	
4.2.5 Increased Pressure		

Table 2: Table of Themes

4.2 Objective 1: Examining the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality.

4.2.1 Work Satisfaction

The analysis of the interviewees' reports showed that participants found technology to improve job satisfaction and reduce workload, rather than increase it. This increases productivity among staff members and efficiency, which is beneficial for service delivery in the Ubuhlebezwe Community. The introduction of technological tools has also enhanced job roles by handling data-intensive tasks. For instance, participant 3 indicated that:

> *'In terms of work satisfaction in general, I think it has actually assisted us in terms of time management, proper reporting as well as uploading our POEs (Portfolio of Evidence), within the system. So, in general, I think it was one of the achievements on our side as Ubuhlebezwe.'*

A participant one indicated the following:

> *'Let's say that it has made work processes more seamless.'*

The same participant also stated that the systems introduced to them had made their job more efficient, as they had previously done everything manually. They emphasized that the municipality must adapt to technology as we enter the 4IR. When properly implemented or integrated with other resources by human resources, technology can result in higher performance or productivity (Sapta, Muafi, & Setini, 2020). Companies must actively involve their employees by fostering motivation and ensuring job satisfaction if they hope to attain and enhance performance (Riyanto, Endri, and Herlish, 2021). It should also be noted that, as much as the introduction of technology improves the service delivery and efficiency of the municipality, it can also pose a challenge to digital overload. According to Roopa (2022), constant emails, texts, and notifications can cause information overload, leading to tension and feelings of being overwhelmed. Employees may struggle to prioritize activities efficiently and may feel pressured to respond to communication quickly, which can affect their overall well-being.

4.2.2 Significant Technological Changes

Findings from this theme suggest that there might have been significant technological changes at the Ubuhlebezwe Local Municipality. Participant three indicated that

technology enhanced their ability to perform their jobs and function. According to Turyadi, Zulkifli, Tawil, and Ali (2023), digital leadership is essential for managing change, enhancing employee performance, and positively impacting overall corporate success. One of the administrative staff members at the municipality stated that the advent of new technology had made it easier for them to monitor their performance. Moving from a manual system to an online one has improved the way they work. In contrast to the other participants who found the technological changes positive, one participant said that the advent of technology had not significantly altered their line of work. Guo, Yin, and Liu (2023) state that uncertainty, complexity, and ambiguity define the technical environment in which digital new ventures operate, necessitating significant continuous research and development (R&D) activities as well as advancements in digital technology. A participant also mentioned that their reporting methods have changed significantly, and they learn new things every year. According to Ghosh and Das (2008), two of the most crucial needs for sensor networks are effective resource management and dependable quality of service.

4.2.3 Stakeholder Interaction

This theme on stakeholder interaction spoke about how interactions between the municipality and external stakeholders were affected by the impact of technological changes at Ubuhlebezwe. In the interview with participant three, it was pointed out that the system's drawback is that, unlike in the past when a supervisor and an employee wanted to submit a leave application, there is no longer any contact between them. Participant five, however, stated that:

> *'The system has made it possible to attend two meetings at the same time…… You find that you need to be on a Zoom meeting and a Teams meeting so you can communicate with clients and record meetings.'*

The lack of physical interaction was also highlighted by one participant who indicated that

> *'With the issue of interaction, you find that it's now standard communication to communicate online. There is no longer physical interaction.'*

The technological systems at the municipality have also allowed room for flexibility where participants indicated that they are able to hold online meetings at home with the work tools of trade provided to them by the municipality. In the interview with participant 7, it was mentioned that there is a difficulty with interaction, as it is now

common practice to converse online. Using technology for communication may lead to reduced face-to-face contact and less practice in reading nonverbal cues (Ruben, Stosic, & Correale, 2021). The participant 8 noted that the method facilitates easier tracking of books from clients. The ninth participant claimed that contacting clients to attend meetings is no longer a laborious task. The tenth participant stated that it has made things easier since it eliminates the need to verify individual availability to join online meetings. According to Barao (2023), one benefit of virtual meetings is the unmatched ease and flexibility they provide for participants. Because there are no geographical restrictions, participants can attend meetings from various time zones, making it simpler to serve clients and teams worldwide.

4.2.4 Work-life balance

The analysed data from the conducted interviews showed that work-life balance was affected by the impact of technological changes at the Ubuhlebezwe Local Municipality. Regarding their online leave system, participant one said that technology had improved their work-life balance within their reporting systems and that they were able to indicate whether they would meet their mid-year assessments; 'It has improved in terms of the balance within our reporting system as well as access to indicate if we won't meet our mid-year assessment. During the interview with participant 3, it was discovered that their work-life balance improved. The same participant stated that:

> *'It has improved, and also in terms of interaction, it has made life easier as I do not have to meet you physically.'*

In line with participant three, participant six stated that

> *'It has improved my work life; it has not worsened it as much as there is too much work when it comes to budgeting. However, when it's time to process after the budgeting is done, you come as an end user to submit the requisition, and the system picks it up automatically. So, it has not worsened for me but the work is a lot.'*

In the last interview with participant ten, the participant stated the following: 'I think it has improved the work life balance because in most cases we interact with people in terms of the meetings we have. It has now become easy because we will meet virtually. So, in that sense it has improved.' According to Szczurek (2023), work-life balance can be aided or hindered by technology. The benefits of technology include time savings, reduced commuting time and costs, less pollution, increased productivity, and more

flexibility. A drawback of technology is that many individuals are constantly connected and so always available. Employers may impose unreasonable reaction times and round-the-clock expectations on their employees, as they are aware of these (Szczurek, 2023).

4.2.5 Increased Pressure

The interviews in this theme revealed that some participants did not perceive any increased pressure from the technological changes at the municipality that affected the employees. This is also one of the advantages of having technology in an organisation, as the purpose of technology is to reduce the workload, which in turn increases productivity. Since they may access the system at any moment, participant one said they do not feel any more pressure. According to participant 2, aside from the leave system, there is no pressure. According to participant 3, they are not under any pressure to take work home because it is entirely up to them. Participant 4 stated that, because they have access to tools of trade, they do feel more pressure to complete reports on weekends. According to participant 5, they used to do their task manually, but the pressure is becoming worse in their unit. Employees mentioned a lack of tech reliability as the primary cause, citing an increase in workload due to technology (Muller-Heyndyk, 2019). According to participant 6, the system has enabled them to be located at any time. Because it is readily available, employees have no justification for failing to submit their reports on time. According to participant 7, their timelines are impacted since they may now practically attend late meetings, having been provided with instruments of trade. According to participant 8, they occasionally must attend two virtual meetings simultaneously and are under more pressure at work. According to the ninth participant, they do not feel more pressure to complete their assignment on time because it is their responsibility if they fail to do so. According to participant 10, there is indeed more pressure because work must be turned in even after hours.

4.3 Objective 2: Evaluating Ubuhlebezwe Local Municipality employees' attitudes and views of these technological advancements, as well as any obstacles they may be facing.

4.3.1 Effects of technology on work duties

This theme suggests that the effects of technology on work duties can lead to a constant need for training on the employed systems, which in turn can result in poor attitudes towards these systems. On the positive side, some participants found the technology to be helpful in how documents are submitted, which allows them to have more control over their work. According to participant 1, their systems have been presented to middle and senior management, and they are attempting to cascade them down to lower-level employees. However, the attitudes of the employees present a problem. Participant 2 noted that the system's implementation has simplified life, particularly concerning document submission. Participant 3 stated that,

> *'We touched on this a little, where I spoke of time management. So definitely in terms of effectiveness, you are able to do more than you were before because you are flexible, and you can prioritise your work.'*

Participant 4 highlighted that technology has made life simpler, particularly when it comes to drafting memos and letters. The fifth participant claimed that staff have become unproductive, particularly when it comes to reporting, and that people's attitudes have become negative. According to participant 6, technology may help, but only if one enjoys their job. While participant 7 indicated that technology has significantly and favourably enhanced their work. The eighth participant claimed that they are experiencing a lack of trade tools due to financial limitations, which has an impact on their job because they must share their equipment with other coworkers. According to participant 9, the library has a system in place that facilitates tracking of books. Participant 10 claimed that because the systems implemented by the municipality are administrative, they have no impact on them. According to Stephen (2024), the nature of work has undergone significant changes, unprecedented in its scope, due to the advancement of technology. Digital technology-enabled remote collaboration, telecommuting, and flexible work schedules are gradually replacing traditional office settings. People can manage their work schedules with more freedom and flexibility as a consequence.

4.3.2 Job Security

The influence of technology on job security is a complex issue that has both positive and negative implications. This theme examined the participants' perceptions of job security in the face of technological changes at the municipality. Based on participant 1, modern technology has helped them achieve their work goals. As stated by Participant 2, technology has aided in tracking issues, and their turnaround time has improved. According to participant 3, their job security is unaffected, as they believe that human interaction is necessary in the workplace. According to participant 4, technology is expected to enhance one's productivity. They also believe that their professions are secure and in high demand. Participant 5 noted that the system exists to improve their lives, particularly at work, rather than putting their jobs at risk. According to the sixth Participant, workers believe the system is in place to keep an eye on them. According to the seventh participant, as a tiny municipality, they are not prepared to be supplanted by technology. According to the seventh participant, technology was meant to simplify their life rather than to take their place. According to the ninth participant, the GIS technology has helped them find cemeteries. The tenth participant claimed that while management is managing the system, lower-level staff are having difficulty. While it is undeniable that artificial intelligence is revolutionizing company operations, it is essential to recognize that automation cannot completely replace people. Instead, human intellect will be complemented by AI-powered automated machinery, which will work in cooperation to increase production and efficiency (Eaton Business School, 2024). The fusion of human and machine intelligence will result in improved accuracy and efficiency in various jobs (Eaton Business School, 2024).

4.3.3 Adjusting to Technology

Adopting an innovative culture, providing sufficient training, and creating a flexible work environment that enables employees to grow and adapt are all essential for adapting to new technologies in the workplace. In the first interview, participant 1 stated that

> *'With the difficulties one has encountered when adjusting to technology, with senior management including myself, we do not have any difficulties in terms of adjusting to the technologies I highlighted earlier on. However, when it comes to lower levels, in terms of our employees' attitude and views, it has not yet*

been accepted as a positive instrument, which can assist in terms of measuring the performance throughout all levels of the municipality.'

According to participant 2, employees feel that their privacy has been compromised and that they are being monitored because the municipality has recently installed CCTV cameras. Corresponding to participant 3, individuals often struggle with adjusting to and accepting change. In an interview with participant 5, the participant said the following: 'The difficulties you will always encounter is that, you know, technology comes with new categories of information. Moreover, the way the 'new' means you have not seen this thing before. According to Participant 6, not everyone is prepared for change, and that is a problem. Participant 7 claimed that they train individuals, although they do have hard-headed employees. Participant 8 stated that funding is one of the most pressing issues they are currently experiencing. The participant further highlighted that they had challenges transitioning from one system to another. Participant 9 mentioned that attitude is an issue since older colleagues are set in their ways. The participant 10 revealed that the connection has been a difficulty. According to Haddad (1996), employee attitudes toward new technology are likely to be influenced by both the implementation process itself and job positions. When the transition is poorly planned, they receive insufficient training, and current organisational practices are not changed to support the shift, even managers are reluctant to accept new technologies.

4.3.4. Training

In today's digital world, workplace training on technology is essential for both employee success and organisational expansion. It entails equipping staff members with the knowledge to utilize new software, systems, and technologies effectively, thereby enhancing productivity, efficiency, and overall business performance. Additionally, efficient technology training may improve work satisfaction and staff morale. This theme focused on the type of training received by municipal employees. According to the first participant, middle and senior management have received adequate training; however, because they still need to contact IT for help, further training would be beneficial. According to the second participant, they receive extensive training before implementing any technical systems. Participant 3 said:

'The trainings that they offered was mostly that they train us and then we will assist everyone else. So, we did one training altogether.'

According to participant 4, the ICT unit did provide them with adequate support. Participant 5 said that since they received training, lower-level co-workers should also receive it. Participant 6 expressed the opinion that the system and the various departments should integrate seamlessly. According to participant 7, they require ongoing training because technology is constantly evolving. The participant 8 said that while they should be getting to train all the time, they did. According to the ninth participant, they received training, but they struggled to grasp it. Participant 10 said the following:

> *'No, we still need more. Especially when I see how busy it gets when our managers are assessing us. I think there are gaps there.'*

Technologies have a significant influence on training and development, facilitating continuous improvement and preparing the workforce for training, which in turn benefits employee productivity and development (Gethe & Hulage, 2024).

4.4 Objective 3: Determining measures that can facilitate technology development and improve workers' productivity in Ubuhlebezwe Local Municipality.

4.4.1 Technological Infrastructure

The success of any organisation depends on a well-designed and well-maintained technology infrastructure. Organisations can increase productivity, teamwork, and overall efficiency while maintaining a competitive advantage by investing in the right technology and facilitating its adoption. Interviews conducted within this theme revealed that infrastructure plays a crucial role in the adoption of technology at the municipal level. According to participant 1, there is nothing available for lower levels of management, but the technology infrastructure is suitable for middle and senior management. Participant 2 reported that the municipality's infrastructure is rated 6 out of 10. According to participant 3, their unit had a system in place, but it never really took off. According to participant 4, they believe their technology infrastructure is at 80%. Participant 5 stated that although they have routers and other tools of the trade to operate with, laptops and other equipment need to be improved. Moreover, participant 6 highlighted how various coworkers hold differing opinions about the

technical infrastructure. According to participant 7, even the systems they are now utilising require an upgrade, so they feel like they are at 60%. According to participant 8, they would have a strong technological infrastructure if not for financial limitations. According to the ninth participant, they struggle with technology. According to the tenth participant, they have to share computers with coworkers and struggle to get the equipment to work correctly. According to the Association for Advancing Automation (2024), reliable and fast communication is made possible by robust infrastructure, which also ensures equal access to opportunities and helps close the digital divide. Promoting diversity increases adoption and digital literacy.

4.4.2 User-friendly Technology

This theme examined the types of user-friendly technology available at the Ubuhlebezwe Local Municipality. According to the first participant, technology can be helpful for senior management, but other co-workers who are not in management need training. Participant 2 said that although their systems are relatively easy to use, other co-workers in different fields still require technological expertise.

> *'Eh…. I would say that our systems are fairly user-friendly, but I have heard from our colleagues who are fundi in various fields that they need to be technologically skilled because that is the direction we are heading towards.'*

Since they made an effort to keep it easy to comprehend, the third participant said that it has been user-friendly. According to the fourth participant, their ICT section is efficient, and staff members use a variety of technologies. According to participant 5, they are lagging, and their unit is unusable. Participant 6 noted that the systems were user-friendly, as they were designed to simplify their work lives. According to participant 7, despite the GIS system's ease of use, some people are nonetheless reluctant to utilise it. According to participant 8, new laptops are needed to support the new systems. According to the ninth participant, while internal workers have email access, external staff members depend on internal personnel to submit reports or leave requests, which can be problematic. Participant 10 noted that,

> *"I wish all the colleagues had access to the systems".*

The public sector implements new technology to accomplish a set of objectives. These objectives are often aimed at enhancing services, boosting capacity, or simplifying processes. Even while all these objectives are top priorities, agencies should also

consider the importance of creating a tech-friendly workplace and investing in their human resources, who are among their most valuable assets (Kronos, 2019).

4.4.3 Increased Productivity

Through process simplification, task automation, communication improvement, and remote work, technology dramatically increases workplace efficiency. The first participant said that they have added fibre to improve connection and generators to run their daily operations.

> *In terms of our day-to-day operations, we are productive. Here and there, we experience network glitches because we are in a rural area. We have installed fibre within our towns just to enhance connectivity, of which we are able to operate on a day-to-day basis.'*

According to the second participant, they regularly use the leave system. According to the third participant, they utilise the PMS system in addition to emails and Microsoft Teams. According to the fourth participant, they utilise the computers and related accessories regularly. According to the fifth participant, they believe they are regressing and that perhaps things will change in six months. According to the sixth participant, they utilize the GIS system. While the seventh participant acknowledged using the PMS system, there is not much else to report. According to the seventh participant, Zoom is used for correspondence and meeting preparation. The ninth participant mentioned that they had tools they utilised, such as laptops, for online meetings and report filing. The tenth participant reported using their laptops and phones daily. Workplace productivity and efficiency are enhanced by technological tools, which can automate manual processes, allowing employees to focus on more critical responsibilities.

4.5 Final Comments

The issue of introducing a system to deal with building plans is currently being addressed conventionally. However, again, it's one of the 'red tape' issues that we have also seen in many municipalities, resulting in investments of up to 2 billion because they took forever to approve building plans. I believe there can be systems beyond the municipality that can enhance efficiency in service delivery, which in turn will attract more private investors, aligning with your investment attraction strategy.

4.6 Chapter Summary

This chapter presents the findings obtained from interviews conducted at the Ubuhlebezwe Local Municipality. The study involved the deliberate selection of ten (10) municipal employees from the Ubuhlebezwe Local Municipality, representing the following departments: Corporate Services, Social Development, Budget and Treasury, Infrastructure and Planning, Community Services, Office of the Municipal Manager, Local Economic Development (LED) & Tourism, and Corporate Services. These comprised administrative clerks, the manager of accounts, the municipal manager's office support personnel, an LED officer, a social development officer, and an infrastructure and planning officer. The results were analyzed using thematic analysis, and the findings were presented in themes and sub-themes.

CHAPTER 5 – CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The data evaluated by the Ubuhlebezwe Local Municipality staff were presented in the preceding chapter. This chapter's discussion centres on the key conclusions drawn from the data analysis. As a result, the last chapters (Chapter 4) would be referred to for comparison or contrast with the literature of earlier academic works on the topic. Various headers and subheadings that summarise the study's aims are followed by a discussion of the main conclusions drawn from the data analysis.

5.2 Identified Research Gaps

Based on the study's conclusions drawn from the analyzed data, concerns appear to exist regarding the technical infrastructure, as some employees are required to share computers with coworkers, and not all employees have access to the most recent tools of the trade. Connectivity problems were also highlighted, as load shedding causes work to halt since some municipal employees' computers are electricity-dependent. It has also been discovered that only senior and middle management have received training on the newly implemented systems in the municipality, implying that general staff members are not adequately prepared to use the systems, despite being expected to do so.

5.3 Findings and Recommendations based on objectives.

Primarily, each objective was accomplished following the analysis of the data. The findings from each study objective are presented in this section, along with additional explanations as needed.

The core of this study was to investigate *'The impact of technological changes on employee performance at Ubuhlebezwe local municipality.'* The specific objectives of this study, as outlined in Chapter 1, include:

- To examine the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality.
- To evaluate Ubuhlebezwe Local Municipality employees' attitudes and views of these technological advancements, as well as any obstacles they may be facing.
- To determine measures that can facilitate technology development and improve workers' productivity in Ubuhlebezwe Local Municipality.

5.2.1 Recommendations: Objective One

The COVID-19 pandemic forced many firms to find new ways to manage their operations, as physical contact was no longer feasible. The Municipality's work is now more productive and efficient due to the implementation of technology solutions, such as the Property Management System (PMS). Some departments in the Municipality claim to be satisfied with the introduction of technology, which in turn increases the level of work satisfaction, even though some departments are not yet on the system. Because technology is typically implemented in companies to ensure positive productivity and a rapid turnaround time, moving from a manual system to an automated system and from in-person meetings to virtual meetings has made the job easier to handle. With the advent of technology, work processes will undoubtedly undergo substantial changes. The way we do things will undoubtedly alter in a world that is constantly evolving. The Fifth Industrial Revolution, a collaboration between humans and machines, is currently replacing the Fourth Industrial Revolution, which was characterized by technical advancements. Change is, therefore, unavoidable. Municipal employees have reported acquiring new skills since the system's launch. However, because they are classified as a rural municipality, their work is compromised by the lack of network accessibility. The municipality should investigate methods to enhance network connectivity that will benefit the community.

Regarding work-life balance, the introduction of technology in any organisation aims to ease the work-life balance of employees; employee attitude also plays a role in determining whether they are accepting of technology or not. Some disadvantages of technology include the lack of physical communication between supervisors and their subordinates, which can result in a communication breakdown; discussions of certain

decisions, such as leave applications or the submission of reports, are lacking, which can lead to unnecessary misunderstandings that could be avoided in a physical meeting because one can see one's emotions and thought process online. On the other hand, an optimistic outlook leads to increased productivity, which in turn facilitates an effective work-life balance. The increasing workload would also impact employee attitudes toward technology. The pressure will probably drop, however. Since their main objective is to ensure that work is completed and results are generated, coworkers who have a good attitude are less likely to experience office pressure.

Based on the Technological Acceptance Model, the Municipality's employees do perceive technology as being useful and making their work more productive. Their intention to use technology is quite positive. However, some colleagues indicated that the lack of tools for addressing trade and network issues makes it difficult for them to intend to use technology in their departments. It was mentioned that the systems introduced by the Municipality were easy to use. Their attitudes towards technology, however, were affected by the Municipality's technological infrastructure and the stress of adapting to change.

5.2.2. Recommendations: Objective Two

At the Municipality, it was noted that senior and intermediate management were taught on the system; therefore, it is understandable why some Participants indicated that the workload had grown with the installation of the system. It needs to be cascaded down to other colleagues to reduce the strain, or management would suffer from techno stress. Certain colleagues appear to have sluggishness in their reporting, which might be attributed to the fact that certain colleagues do not have access to the system. The absence of tools of trade is also a cause for concern because, no matter how good and efficient the system is, a lack of equipment can be frustrating and demotivating. We live in an unstable economy where people who have jobs value their work. Some workplaces fear that technology will replace them, but in the municipality, people do not share this concern. They feel secure in their jobs because any new system requires human input, but as with anything new, there will always be problems with adjustment. One's attitude determines how quickly they adjust to the system, and training is crucial in helping people adapt to it. Training should be continuous until people feel comfortable working on the system independently. Sometimes you find that people are

set in their ways and do not want to change, which hinders productivity at work. Additionally, co-workers may encourage one another to boycott the system. Because management has access to the system, other coworkers' views on embracing the technology will be impacted, as they will believe that management should retain control of the system rather than having it cascade down. To ensure that people have the necessary skills to operate the system, training should also be a top priority. However, it should be accessible to everybody and not just senior management.

5.2.3 Recommendations: Objective Three

A high level of technological infrastructure is necessary for technology to flourish; employees should be well-equipped with laptops, desktop computers, printers, internet access that is unhindered by connectivity, and smartphones; once they have these tools of trade, there is no reason why they cannot be productive; a yearly budget for tools of trade should be established so that the excuse of financial limitations is eliminated; technology should also be easy to use because it makes our lives easier; therefore, it must be user-friendly, and regular training is necessary to make it so. If the municipality is having difficulty training its staff members due to financial constraints, the ICT unit within the municipality should be prioritized for training. In exchange, they will train their colleagues, saving the municipality money.

5.3 Conclusion

In Chapter Five, Findings and Recommendations, the researcher presents the findings from the research and provides recommendations based on these findings. This chapter concludes the research. The researcher examined the influence of technology adoption at the Ubuhlebezwe Local Municipality and determined that they were on the right track. The Municipality can outline the goals and objectives it adopts for integrating new technologies, ensuring they align with the overall municipal strategy. Ubuhlebezwe Local Municipality can also explain to the municipal employees the reasons behind the technological changes, their benefits for both the municipality and employees, and address any concerns openly. The municipality can also fund training initiatives that provide all staff members with the knowledge to use emerging technology efficiently. To assist municipal staff in adjusting to the changes, they should

provide ongoing support and resources. Different learning styles can be accommodated through a variety of training techniques, including seminars, online courses, and practical exercises. Additionally, the municipality can implement measures to support staff in establishing limits on digital communication, managing screen time, and promoting regular breaks. Encourage the use of applications for well-being and consider implementing digital detox days. This will support the promotion of employees' digital well-being. The municipality can also promote team-building events and provide chances for both virtual and in-person encounters to help employees retain strong social relationships at the workplace within the different departments.

The municipality should acknowledge that technology cannot replace human engagement in establishing rapport and trust, but rather strike a balance between the two. Where appropriate, promote in-person interactions.

In conclusion, through pre-emptive measures to mitigate both the positive and negative effects of technological advancements, the Ubuhlebezwe Local Municipality can leverage the advantages of technology to improve worker productivity while protecting their health and ensuring a seamless transition.

5.4 Contribution to the Body of Knowledge

Research on technological improvements and employee performance contributes to the body of knowledge by examining how technology affects various aspects of work, including job satisfaction, employee empowerment, and company performance. By examining the linkages between technology adoption, employee attitudes, and performance outcomes, the Ubuhlebezwe Local Municipality may gain insight into how to successfully navigate the challenges and opportunities presented by technological change. Among the contributions is recognising the effect on employee behaviours and attitudes; the study's findings indicate that employee attitudes may mediate the relationship between employee performance and technology. The researcher investigated the efficacy of several training and development programs designed to enhance employee cognitive capacities and facilitate technology adoption. The research also examined how technology improvements might improve municipal production, efficiency, and competitiveness. Finally, Resolving Possible Negative

Effects: Studies show that technostress may have a detrimental effect on worker productivity and performance.

5.5. Future Related Study

Future studies examining the impact of technological advancements on employee optimal performance could investigate the role of technology in employee development within rural municipalities. The studies can examine how digital platforms and online learning tools can be used to effectively train employees at rural municipalities on new technologies and skills. Case studies can be conducted on rural municipalities that have implemented technology-based training programs and measure the impact on employee performance, skill development, and job satisfaction.

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Appendix 1: Consent Letter

The statement of agreement to participate in this academic piece:

- I hereby confirm that I have been contacted and arranged to meet with the researcher, Mr Lethukuthula Dlamini about the research project understudy and the nature of risks, benefits associated to it.
- I was made aware that my personal information including age, gender, level of education and years of experience serving the organisation will be required on the data collection instrument and anonymously processed and codified.
- I was guaranteed that on information volunteered will be kept confidential, in the lockable safe and be used for research purpose only.
- I do confirm that I was not coerced to participate to this study and no financial benefits attached to my full participation and I may, at any time, without prejudice withdraw from participating this study.
- I was assured that upon completion of this study, the literature will be made available to me.

_____ _____ _____

_____

Full Name of Participant **Date** **Time** **Signature**

I, Mr Lethukuthula Paul Dlamini, herewith confirm that the above participant has been informed fully about the risks, benefits, and conduct of the research paper.

_____ _____

_____

Full Name of the Research **Date** **Signature**

Appendix 2: Interview Questions

TOPIC: The Impact of Technological Changes on Employee Performance at Ubuhlebezwe Local Municipality.

UNIVERSITY OF KWAZULU NATAL

Research Aim(s): This research will examine the precise ways that different technology developments affect and enhance Ubuhlebezwe Local Municipality employees' productivity, efficiency, and general job satisfaction. This research aims to determine the best technology approaches to improving organisational results by looking at the relationship between staff performance measures and technological introduction.

Terms of Interview:

- All information that you provide, including name and contact details, will in no way be linked to you as an individual.
- Contact details will not be given out, they are needed for formal purposes.
- Participation in this interview is voluntary.
- This interview will take approximately 20-30 minutes.
- By completing the declaration below, you permit us to use your responses and you show that you understand the terms.

Declaration by participant:
I hereby allow my responses to be used in this research and acknowledge that I understand the above terms of the survey.

Contact no: …….
Date: ……
Signature: ……

SECTION A: To examine the effects instigated by technological changes among employees at Ubuhlebezwe Local Municipality.

The following questions are based on the objective to examine the effects instigated by technological changes.

1. What effect has the introduction of new technologies had on your level of work satisfaction in general?
2. Can you describe the most significant changes in your work processes since the implementation of (specific technology)?
3. How has technology affected the way you interact with colleagues and clients?
4. Has technology improved or worsened your work-life balance? Please explain.
5. Do you feel increased pressure to be available outside of regular work hours due to technology?

SECTION B: To evaluate Ubuhlebezwe Local Municipality employees' attitudes and views of these technological advancements, as well as any obstacles they may be facing.

The following questions are based on the objective that seeks to evaluate the Municipality's employees 'attitudes and views on technology.

6. In what ways has the advent of [certain technology] altered the duties and nature of your work?
7. Do you think that [certain technology] will improve your work or put your job security at risk?
8. What difficulties did you encounter when adjusting to new technologies?
9. Do you think you have had enough help and training to use new technology effectively?

SECTION C: To determine measures that can facilitate technology development and improve workers' productivity in Ubuhlebezwe Local Municipality.

The following questions are based on the objective of determining measures that facilitate work improvement by employees at the Municipality.

10. What is the municipality's present level of technological infrastructure?
11. How usable is technology for staff members at various organizational levels?

12. Which technology tools are most often employed in day-to-day operations, and how successful are they in increasing productivity?

Thank you for your participation

Appendix 3: Permission to Submit Thesis

College of Law and Management Studies

Supervisors Permission to Submit Thesis/ Dissertation for Examination

Name: Lethukuthula Paul Dlamini	Stud No: 221059003	
Title: Mr		
Qualification: Mcom in Leadership Studies	School: Graduate School of Business and Leadership	
	Yes	No
To the best of my knowledge, the thesis/dissertation is primarily the student's own work and the student has acknowledged all reference sources	x	
The English language is of a suitable standard for examination without going for professional editing.	x	
Turnitin Report %	6%	
Comment if % is over 10%		
I agree to the submission of this thesis/dissertation for examination	x	
Supervisors Name: Dr M Vilakazi		
Supervisors Signature:		
Date:		
Co- Supervisors Name:		
Co- Supervisors Signature:		
Date:		