



**INVESTIGATING THE STRATEGIC FACTORS INFLUENCING THE ROLE OF MOBILE
NETWORK OPERATORS IN THE IMPLEMENTATION OF E-HEALTH SYSTEMS AT
MOBILE TELECOMMUNICATIONS LIMITED IN NAMIBIA**

BY

Elton C.F. Katangolo

STUDENT NO: 200221272

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Supervisor: Prof. Nikodemus Angula

07 April 2025

DECLARATION

I, Elton C.F. Katangolo, hereby declare that this dissertation is the product of my own research and original work. I confirm that it has not been submitted, either in part or in full, for any degree or qualification at any other university or institution.

Sign: ... 

.....07 April 2025.....

Elton C.F. Katangolo

Date:

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ABSTRACT

E-health plays a critical role in enhancing healthcare delivery, accessibility, efficiency, and overall service quality through the integration of digital technologies. Recognizing the strategic value that mobile network operators can bring to this transformation, this study focuses on evaluating the strategic factors influencing the role of Mobile Telecommunications Limited (MTC) Namibia in the implementation of e-health systems. The main research objectives were to explore the current eHealth initiatives, to investigate the drivers and barriers towards effective eHealth implementation as well as to develop strategic interventions that MTC could adopt to enhance eHealth services in Namibia. The study adopted a qualitative approach, which enabled the collection of detailed, context-rich data that helped to uncover the factors influencing eHealth systems. Additionally, the qualitative approach allowed the researcher to explore not just what happens but also why it happens, focusing on participants' perspectives and experiences. Consequently, a sample of twelve participants was selected from a population of 800 employees using the non-probability sampling technique which is a purposive quota sampling strategy to recruit members of specific segments to constitute the sample from the population. Therefore, the research study involved data collection from the selected participants in which an open-ended questionnaire was self-administered. Consequently, the study found that there is a complementary understanding of MTC's eHealth initiatives across different organisational levels. Additionally, the study findings revealed that there is a shared understanding across organisational levels regarding the alignment of eHealth initiatives with Namibia's healthcare needs. Additionally, the study found that there is a wide range of applications, including electronic health records (EHRs), telemedicine, mobile health (mHealth), and wearable health technologies, all aimed at enhancing patient care and operational efficiency. Furthermore, the study revealed that Health Information Systems (HIS) are integrated systems designed to manage healthcare data, ensuring its collection, storage, and dissemination across various stakeholders in the healthcare sector. Moreover, the study revealed that partnerships are fundamental to the successful implementation of eHealth solutions, as they enable the pooling of resources, expertise, and innovation from diverse stakeholders. Additionally, the study revealed that the feedback from healthcare providers and patients regarding the effectiveness of MTC's eHealth initiatives shows mixed perspectives, highlighting both strengths and areas for improvement. Consequently, based on the findings of the study on the factors influencing Mobile Network Operators (MNOs) in eHealth systems at Mobile Telecommunications Limited (MTC) Namibia, the study

recommends that MTC should implement continuous training and capacity-building programs to enhance the digital literacy of healthcare providers and technical staff. These programs should focus on the effective use, maintenance, and troubleshooting of eHealth platforms while considering Namibia's cultural and societal contexts. It is also recommended that MTC establishes stronger partnerships with healthcare providers, government agencies, and non-governmental organizations. Collaborative frameworks can enable resource sharing, policy alignment, and joint development of eHealth solutions tailored to Namibia's healthcare needs. To build trust and ensure compliance with regulatory requirements, MTC should prioritise robust data privacy and security protocols. This includes implementing advanced encryption, secure authentication methods, and regular audits to address concerns about data breaches and misuse. Apart from that, MTC should deploy affordable and user-friendly eHealth technologies in underserved and rural areas. Leveraging mobile connectivity and community outreach programs can help overcome barriers related to technological access and acceptance. Additionally, MTC should explore the adoption of emerging technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) to enhance eHealth services. These technologies can improve data management, streamline healthcare delivery, and offer innovative solutions for disease monitoring and patient engagement. Lastly, it is recommended that MTC should design a comprehensive sustainability strategy for its eHealth initiatives, focusing on financial viability, scalability, and adaptability to technological advancements. This includes securing funding through partnerships, grants, and government support to ensure continuity of eHealth projects.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

The integration of e-health systems by mobile network operators (MNOs) is a significant innovation in global healthcare, offering new opportunities to enhance accessibility, affordability, and quality of services. E-health systems leverage mobile technology to support telemedicine, health monitoring, and patient management, addressing gaps in traditional healthcare delivery (World Health Organization, 2020). Globally, the e-health market has experienced rapid growth, with its value projected to reach \$190 billion by 2025, driven by advancements in information and communication technology (ICT) and increasing healthcare demands (Grand View Research, 2022). Despite its potential, the successful implementation of e-health systems by MNOs faces several challenges, including interoperability issues, high operational costs, and inadequate digital infrastructure, which limit the scalability of these solutions (Ryu et al., 2019).

The challenges associated with e-health systems are more pronounced in developing countries, where disparities in ICT infrastructure, financial resources, and technical expertise hinder effective adoption. A study in India highlighted that only 35% of healthcare providers had access to the necessary digital infrastructure to support e-health systems, leading to inconsistent healthcare delivery (Ranganathan & Kuruvilla, 2021). Similarly, cybersecurity and data privacy concerns have emerged as significant barriers, with 68% of healthcare organizations globally reporting cyberattacks targeting sensitive patient data in 2021 (Smith et al., 2021). These challenges necessitate collaborative efforts among MNOs, governments, and healthcare stakeholders to develop robust frameworks that address operational, technical, and regulatory barriers.

While e-health has made notable progress globally, it remains underutilised in regions with limited access to ICT, particularly in rural and underserved areas. Studies reveal that in sub-Saharan Africa, over 60% of the population resides in areas with insufficient mobile network coverage, making it difficult for MNOs to provide reliable e-health services (Muthuri et al., 2020). High data costs and weak regulatory frameworks further compound these issues, creating a complex environment for e-health adoption. Addressing these global challenges requires innovative strategies that leverage mobile technology to bridge gaps in healthcare

delivery, emphasising the importance of localised solutions informed by global best practices.

1.2 Background of the Study

Mobile Telecommunications Company (MTC) is a mobile company that provides telecommunications and internet services in Namibia. According to MTC Report Guide (2023), the telecommunications mobile company was established in 1995 and has a staff complement of four hundred and twenty-one. This company operates the only full-service customer contact centre in Namibia dealing with service queries ranging from telephony, SMS, fax, GPRS, data, voicemail, and 3G/HSDPA. A staff of 421 persons serves a diverse market of pre- and post-paid subscribers. MTC Report guide (2023) states that MTC is the biggest telecommunications company in Namibia with a subscriber base of more than two million users.

Research by Venkatesh et al. (2023) pointed out that in the United States of America information communication technology plays an important role in the provision of e-health care systems. Additionally, eighty percent (80%) of people in developed countries such as Germany, France, and Italy largely rely on mobile networks in accessing e-health care. Research also revealed that the provision of e-healthcare systems to people in developed countries has significantly transformed the medical industry since technology facilitates the diagnosis of patients without having to travel long distances. However, in the USA, studies have shown that e-healthcare is associated with high costs since forty percent of the population struggles to pay health fees that come along with e-healthcare systems. According to Iyamu et al. (2014), the overwhelming nature of data in the e-healthcare system limits its use in developed countries since medical practitioners prefer to use manual systems. Sharma and Jaiswal (2018) concur that major public hospitals find the use of manual systems secure as patients' information needs to be treated as confidential.

However, similar studies conducted in developing countries revealed that e-health is yet to be fully established in many countries. Studies by Hoque et al. (2019, p. 12) noted that the provision of e-health in Ghana would significantly reduce medical costs associated with transportation. According to Hoque et al. (2019) improving the delivery of health care in Ghana is still a major challenge in remote and urban areas due to the lack of infrastructure and expertise. Research by Tornatzky and Fleischer (1990) reveals that setting up e-health facilities in Ghana and other African states would vastly improve the healthcare sector since

e-healthcare is not used by a fraction of the population that constitutes about fifteen percent of the African continent. Studies have shown that the adoption of e-health systems in Africa is slow. According to Smith (2019), two percent of African countries have access to e-healthcare systems due to lack of affordability and lack of resources needed. Additionally, Mobile Networks in African countries charges exorbitant fees which limits the accessibility and use of the e-health care systems. Zayyad and Toycan (2018) pointed out that the rapid adaptation of e-health care systems would accelerate knowledge diffusion consequently increase the assess to quality health information.

Research shows that e-Health's benefits such as accelerated sustainable health development and universal health coverage (Getachew et al., 2023). However, e-health adoption and implementation remain low in developing countries. Evidence by Gregory and Tembo, (2017) shows that despite the national e-health systems implementation programmes in most developing countries covering over 666 out of 1956 representing 34% of health facilities with e-health applications only 37 were functional model sites representing 1.8%. This adoption rate remains relatively low to achieve meaningful use and can be attributed to many factors. For Namibia challenges such as geographical barriers, high costs, lack of data interoperability, and privacy concerns (Zayyad & Toycan, 2018).

Integrating e-health through MTC could address these issues, aligning with Vision 2030 to improve health services. The present study aims to contribute to sustainable health development and universal coverage in Namibia by addressing these challenges and utilising MTC's resources. According to Getachew et al., (2023) the MTC health facility coverage map, 80.1% of health facilities are covered by 2G networks, 79.15% by 3G, and 67.75% by 4G networks, indicating the potential for e-health services while also revealing regional disparities that may affect service delivery. Consequently, the study sought to investigate the factors influencing mobile network operators in e-health systems using a case study of Mobile Telecom Communications Limited (MTC) Namibia. The findings provided insightful information to stakeholders in the healthcare and telecommunications industries, guiding the development of policies and plans that support the long-term integration of e-health systems to improve healthcare delivery throughout Namibia.

1.3 Statement of the Problem

The integration of e-health systems by mobile network operators (MNOs) has gained global attention as a transformative approach to improving healthcare delivery. E-health systems

utilise mobile technologies to enhance healthcare accessibility, affordability, and quality, especially in underserved regions (World Health Organization, 2020). Globally, the e-health market is projected to reach \$190 billion by 2025, reflecting increased adoption and innovation (Grand View Research, 2022). However, MTC as a mobile network operator in Namibia faces critical challenges in implementing e-healthcare systems due to high operational costs, inadequate digital infrastructure, and concerns about cybersecurity and data privacy (Ryu et al., 2019). According to 75% of hospitals and clinics in Namibia still rely on manual healthcare systems due to the lack of infrastructure from MTC as well as lack of expertise to kick start the innovation.

Several empirical studies have been conducted globally to investigate factors influencing mobile network operators (MNOs) in e-health systems. In Ghana, a study by Asare et al. (2020) explored the challenges of integrating mobile networks into e-health systems. The researchers employed a mixed-methods approach, combining surveys and interviews with stakeholders, including healthcare providers and mobile operators. The population consisted of 2,000 participants, with a sample size of 300 selected using stratified random sampling. The study found that 60% of MNOs struggled with inadequate infrastructure, and 45% identified regulatory challenges as a significant barrier to implementing e-health solutions.

Similarly, in India, Patel et al. (2021) examined the financial implications of e-health partnerships for MNOs. Using a quantitative approach, the study analysed financial data from 20 mobile operators. The population consisted of all operators engaged in e-health collaborations, with a sample size of 15 selected based on revenue generation. The findings revealed that while MNOs experienced an initial decline in profit margins due to infrastructure investments, they reported a 25% increase in revenue within three years of implementing e-health systems. The study underscored the importance of long-term financial planning for successful MNO participation in e-health.

Moreover, in Kenya, a qualitative study by Otieno and Wanyama (2020) investigated the impact of public-private partnerships (PPPs) on e-health initiatives. The researchers conducted focus group discussions and in-depth interviews with a population of 150 stakeholders, including government officials, healthcare providers, and MNO representatives. A purposive sample of 50 participants was selected. The study revealed that PPPs significantly enhanced the scalability of e-health services, with 80% of participants

emphasising the importance of collaborative funding and resource sharing to address operational challenges faced by MNOs.

Additionally, in Sweden, Johansson and Lundberg (2022) conducted a study on the role of data security and privacy in influencing MNOs' engagement in e-health. Using a survey-based methodology, the researchers targeted a population of 500 IT managers from healthcare institutions and MNOs, selecting a sample of 200 through simple random sampling. The study found that 78% of respondents identified compliance with the General Data Protection Regulation (GDPR) as a critical factor affecting their willingness to invest in e-health systems. The study concluded that regulatory compliance frameworks must be simplified to encourage greater MNO participation.

However, there is no known research in Namibia that has been conducted to investigate the strategic factors influencing the role of mobile network operators in the implementation of e-health systems at Mobile Telecommunications Limited. The research gap identified in the empirical studies is the lack of specific focus on the factors influencing mobile network operators (MNOs) in the context of e-health systems within Namibia, a region with distinct socio-economic, regulatory, and technological conditions. While global studies have explored various challenges such as infrastructure, regulatory issues, public-private partnerships, and data security, there is insufficient research addressing these factors within Namibia's unique environment. Additionally, there is a limited exploration of how MNOs can adopt strategic interventions to enhance e-health services in developing regions. This current research aims to close this gap by focusing on Namibia's specific challenges and opportunities, providing insights into drivers and barriers for MNOs, and offering actionable strategic interventions to improve the implementation of e-health systems in the country. By addressing these factors, the study aims to contribute to a sustainable model for e-health system integration in Namibia.

1.4 Research Objectives

To investigate the factors influencing the role of mobile network operators in electronic health management systems at MTC in Namibia.

1.4.1 Sub-Objectives of the Research

- i. Explore the current e-health initiatives by MTC in Namibia
- ii. Investigate the drivers and barriers towards effective e-health implementation by MTC in Namibia

- iii. Develop strategic interventions that MTC could adopt to enhance e-health services in Namibia

1.5 Research Questions

- i. What are the existing e-health initiatives undertaken by MTC in Namibia?
- ii. What are the main drivers and barriers towards effective e-health implementation by MTC in Namibia?
- iii. What factors affect the involvement of Mobile Network Operators, particularly MTC Namibia, in the integration and advancement of e-health systems in Namibia?

1.6 Significance of the Study

The study's findings contribute to the body of knowledge that researchers have about the factors influencing mobile network operators in e-health systems. E-health systems that use mobile telecommunications are crucial for increasing access to healthcare, particularly in underserved and distant areas. Access to healthcare for underserved communities can be improved by increasing the delivery of healthcare services using mobile platforms and comprehending the role and difficulties faced by mobile network operators (MNOs) in these systems. Additionally, the current study aids in optimising the performance of e-health systems by identifying the elements that impact MNOs, such as network infrastructure, technological prowess, and regulatory challenges. Improved patient outcomes, prompt medical interventions, and faster communication between patients and healthcare providers are all results of better service delivery.

The results of the study can give regulators and policymakers important new information. Policies that encourage innovation, guarantee adherence to health regulations, and support long-term business models for MNOs providing healthcare services can be developed with guidance from an understanding of the interactions between MNOs and e-health systems.

Mobile telecommunications-powered e-health systems can lower expenses related to conventional healthcare delivery, including travel and infrastructure construction. This current study can assist in streamlining operations and make healthcare more cost-effective for consumers and providers by examining factors that affect MNOs.

New technologies like telemedicine, mobile health apps, and remote patient monitoring are greatly aided by mobile network providers. Knowing what influences MNOs will help with

better integrating these technologies into e-health systems, which could result in innovations that raise the standard of healthcare.

Sensitive patient data must be handled securely in e-health systems. The study addresses important issues regarding the secure transmission and storage of health information, which is essential for patient confidence and regulatory compliance, by examining elements that affect MNOs, such as network security and data privacy laws.

1.7 Limitations of the Study

The e-health and mobile telecom sectors are developing rapidly. The results of the present study may become less applicable or out of date if new laws or technologies are developed during or shortly after the study. Also, e-health services and mobile network carriers are frequently subjected to intricate, location-specific laws. The results of a study may not be applicable to nations with distinct legal or health regulations if it is carried out in one with particular regulatory frameworks. The findings' applicability may be impacted by regulatory changes that happen after the study is finished, such as new telecom or data protection regulations. For competitive reasons, MNOs frequently safeguard their data and tactics. This may restrict access to pertinent data, which could impact the breadth of the research. Disparities in network coverage, availability, or speed (such as those between rural and urban areas) may impact the deployment and efficacy of e-health systems, even if the study may have assumed that mobile network infrastructure is consistent across geographical boundaries. The viability of MNO participation in e-health systems may be impacted by variations in device types (such as smartphones versus basic phones) or acceptance levels among user categories (such as senior populations). Given that MNOs handle sensitive health data, the study might not fully address cybersecurity issues or the consequences of data privacy for e-health systems. Given that e-health is an emerging issue in Namibia, MTC's management may be hesitant to share sensitive information about their e-health strategy, potentially affecting data richness. To address this, the researcher assured management that the findings would be kept confidential and used solely for this study and not shared with unauthorized individuals or competitors.

1.8 Assumptions

In this study, several assumptions were made. It was expected that key MTC personnel, including executives and managers involved in eHealth projects, would participate in the research and provide valuable, honest insights. The study also assumed that access to

necessary internal reports and data would be granted, as this information is essential for the research's quantitative analysis. Another assumption was that the external environment, including regulatory frameworks and technological conditions, would remain stable throughout the research period, allowing the study to proceed as planned.

1.9 Delimitation of the Study

It was essential for the researcher to clarify the boundaries within which this research would operate. This ensured that the study remained focused and manageable. Hence, this study was delimited to focus solely on Mobile Telecom Communications Limited (MTC) in Namibia. This meant that the findings or conclusions of this study are specific to the Namibian context and may not be directly applicable to other countries or telecommunications operators outside Namibia. The research was delimited to MTC as the primary mobile network operator involved in e-health solutions. The study was also delimited to the examination of only mobile network infrastructure and related technologies directly involved in supporting e-health systems such as network bandwidth, security protocols, data storage, and transmission capabilities. The study covered e-health systems as they pertain to MTC's network and operational roles and focused on telemedicine, mobile health applications, and digital health data management as supported by MTC. The study was delimited to data and developments within the past five years to ensure that it reflected recent technological advancements and regulatory changes, thus keeping findings relevant to current market and industry standards.

1.10 Format of the Study

The study is divided into five Chapters. Chapter One serves as a general introduction to the research, and it covers among other topics background of the study and statement of the problem. Chapter Two provides a comprehensive literature review that aligns with the study's research objectives. Chapter Three outlines the methodology, detailing the research design, population, sampling methods, and procedures. It also discusses the research instruments, data collection methods, and techniques for data analysis. Chapter Four deals with an analysis of the data collected during the data collection period and discussion of those findings. Lastly, Chapter Five presents the study's summary, conclusions and recommendations.

The following diagram illustrates the organisation of the study:

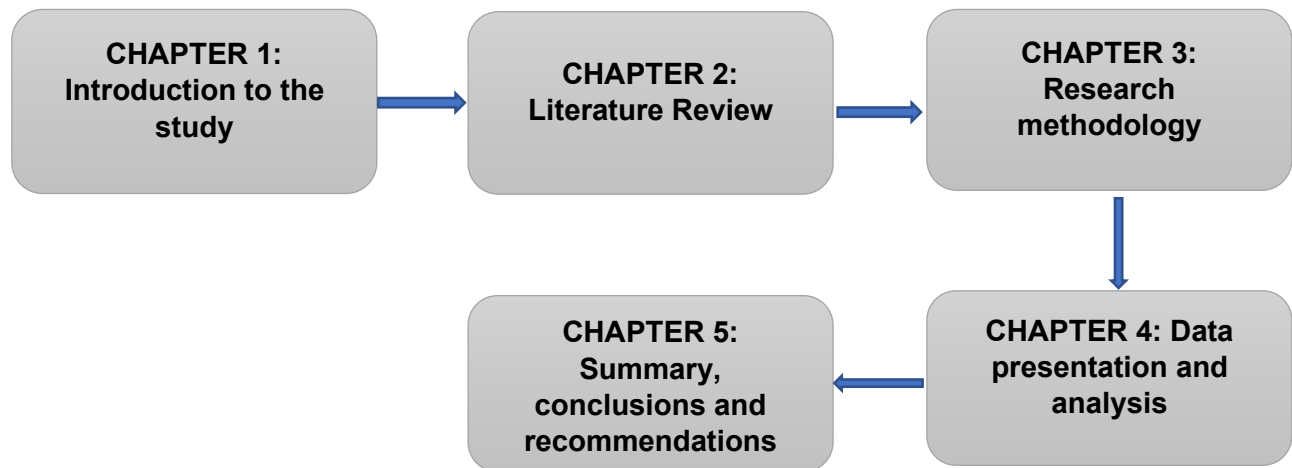


Figure 1: Layout of the study

1.11 Definition of key Terms

Mobile Network Operators (MNOs): MNOs are companies that provide wireless communication services, including voice, data, and internet services. They play a key role in enabling mobile-based health interventions and telemedicine. (Patel et al., 2021).

E-Health: e-health refers to the use of information and communication technology (ICT) to improve healthcare services. It includes digital health records, telemedicine, mobile health applications, and online health information (Hagg et al., 2021).

Telemedicine: Telemedicine is the practice of using telecommunication technology to provide remote healthcare services. This can include consultations, diagnoses, and patient monitoring, which are increasingly facilitated by MNO networks (Moses & Peters, 2020).

Mobile Health (mHealth): mHealth is the use of mobile devices, such as smartphones and tablets, to support healthcare services. It includes health tracking apps, telehealth consultations, and medication reminders, relying on MNOs' infrastructure (Booyesen et al., 2020).

Infrastructure: In e-health, infrastructure refers to the physical and technical systems necessary to deliver digital health services. This includes network coverage, mobile data capacity, and data security measures (Moses & Peters, 2020).

Regulatory Challenges: These are legal and policy-related issues that hinder the adoption of e-health services. Regulatory challenges for MNOs can include data privacy laws, healthcare regulations, and telecom policies (Van der Merwe et al., 2019).

Interoperability: Interoperability is the ability of different e-health systems and technologies to communicate and exchange information seamlessly (KPMG, 2020).

Data Security: Data security refers to the protection of health-related data from unauthorized access, alteration, or loss. MNOs play a crucial role in securing health data transmitted through their networks (Hagg et al., 2021).

Digital Divide: The digital divide refers to the gap between individuals or communities with access to technology and those without. MNOs play a role in bridging this gap by improving access to mobile-based e-health services, especially in rural areas (Moodley & O'Neil, 2021).

Telecommunication Networks: Telecommunication networks are the backbone for delivering mobile health services. These networks, managed by MNOs, must be robust enough to handle large volumes of health data and provide reliable service for e-health applications (Booyesen et al., 2020).

1.12 Chapter summary

The Chapter introduced the research and highlighted key elements of the research such as the background of the study, statement of the problem, the research objectives and their corresponding questions, significance of the study, limitations of the study, delimitations of the study, and the format of the study. The following Chapter will detail the literature that underpins this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This Chapter delved into literature pertinent to the study. A literature review entails a structured examination of relevant scholarly works that are closely linked to a specific area of research. Accordingly, the literature examined related to the current e-health initiatives by mobile network operators, investigated the drivers and barriers towards effective e-health implementation as well as strategic interventions that could be adopted to enhance e-health services.

2.2 Theoretical Literature

2.2.1 Electronic Health (e-health)

Electronic Health (e-health) refers to the use of digital technologies and information and communication technology (ICT) to support healthcare services and information management (Eysenbach, 2001). E-health has become a transformative tool in modern healthcare, facilitating a wide range of applications such as electronic health records (EHRs), telemedicine, mobile health (mHealth), and wearable health technologies, all of which contribute to improving patient care and operational efficiency (He et al., 2019). These technologies enable healthcare providers to access patient information instantly, enhancing decision-making, patient safety, and overall treatment outcomes (Kellermann & Jones, 2013).

2.2.1.1 Blockchain for Health Data Security

As empirically revealed, blockchain provides a secure, transparent method of handling healthcare data by establishing a decentralised system that prevents data breaches and guarantees people have authority over their health information. Research has shown that blockchain technology has emerged as a promising solution for enhancing health data security due to its decentralized and tamper-proof nature (Smith et al., 2021). By storing health data across multiple nodes, blockchain ensures that information is not vulnerable to central points of failure or unauthorized access (Lee & Kim, 2020). Moreover, it allows for secure sharing of patient data between healthcare providers while maintaining patient privacy (Patel et al., 2021). Blockchain's cryptographic features offer an added layer of

security, reducing the risks of data breaches and cyber-attacks (Jones & Morgan, 2020). This technology can also enhance transparency and trust in healthcare systems, as all transactions are recorded and verified on an immutable ledger (Smith et al., 2021). However, challenges such as scalability and regulatory acceptance still need to be addressed for widespread implementation in healthcare (Lee & Kim, 2020). Despite these hurdles, blockchain is viewed as a key enabler of secure, efficient, and interoperable e-health systems (Patel et al., 2021).

2.2.1.2 Digital Therapeutics

Sinha et al. (2020) noted that digital therapeutics are evidence-based, software-driven interventions that provide treatment for various medical conditions through digital platforms such as apps or virtual therapies. Sinha et al. (2020) accentuate that, digital therapeutics have proven effective in managing chronic diseases like diabetes, mental health disorders, and substance abuse by offering personalised treatment plans and real-time monitoring. These interventions are designed to complement or even replace traditional therapies, often without the need for physical visits to healthcare facilities (Muench et al., 2021). The scalability and accessibility of digital therapeutics make them particularly valuable in resource-limited settings. Moreover, studies by Lorig et al. (2018) have highlighted the effectiveness of digital therapeutics in improving patient engagement and adherence to treatment regimens. As a result, digital therapeutics are rapidly becoming a crucial tool in modern healthcare systems.

2.2.1.3 Wearable Health Devices

Wearable health devices are portable technologies designed to monitor and track various health metrics such as heart rate, physical activity, and sleep patterns (Jones et al., 2020). These devices, often integrated with smartphones, provide real-time health data, enabling users to make informed decisions about their well-being (Smith & Brown, 2021). According to Lee and Kim (2022), wearable health devices play a critical role in preventive healthcare by identifying early signs of potential health issues. Additionally, Patel et al. (2020) highlight their utility in managing chronic diseases by facilitating continuous monitoring and data sharing with healthcare providers.

Despite their benefits, some researchers note limitations. For instance, Johnson et al. (2021) argue that the accuracy of wearable devices can vary, potentially leading to unreliable health

assessments. Conversely, Wilson and Carter (2020) emphasise the importance of improving user data privacy and addressing security concerns, as wearables often store sensitive health information. Nevertheless, the consensus is that wearable health devices are transforming personal healthcare management and empowering users through advanced technology (Jones et al., 2020; Smith & Brown, 2021; Lee & Kim, 2022).

2.2.1.4 Health Information Systems (HIS)

Health Information Systems (HIS) are integrated systems designed to manage healthcare data, ensuring its collection, storage, and dissemination across various stakeholders in the healthcare sector (Wager et al., 2017). At the core, HIS facilitates decision-making by providing accurate and timely data to healthcare providers and policymakers (Balgrosky, 2020). According to Liyanage et al. (2022), HIS supports clinical, administrative, and financial functions, thereby improving operational efficiency and patient care outcomes.

Furthermore, HIS enables interoperability by connecting diverse health systems, allowing seamless exchange of information (Sheikh et al., 2021). This integration is essential for implementing e-health initiatives and achieving universal health coverage (WHO, 2019). Despite its benefits, challenges such as data security, privacy concerns, and limited resources in developing countries hinder effective implementation (Balgrosky, 2020). Nonetheless, HIS remains a cornerstone of modern healthcare, driving advancements in health service delivery (Wager et al., 2017; WHO, 2019).

2.2.2 The Current e-Health Initiatives by Mobile Network Operators

Current e-health initiatives are transforming healthcare delivery worldwide, with significant implications for improving accessibility and efficiency. As Zhang et al. (2020) noted, e-health encompasses a wide range of digital tools, including telemedicine, electronic health records (EHRs), and mobile health applications. In Namibia, organisations like MTC have begun leveraging mobile networks to facilitate healthcare services in remote areas (Johansson & Lundberg, 2022). These initiatives aim to bridge the gap between urban and rural healthcare delivery, enhancing service availability (Zhang et al., 2020). However, the success of these initiatives depends on the extent to which they are integrated into existing healthcare frameworks (Johansson & Lundberg, 2022).

One major component of the current e-health initiatives is telemedicine, which enables remote consultations between healthcare providers and patients. According to Silva et al.

(2021), telemedicine reduces the need for physical visits, saving time and resources. In Namibia, telemedicine initiatives are gaining traction, particularly in areas where specialist care is unavailable (Patel et al., 2021). These programs have proven effective in diagnosing and managing chronic illnesses, such as diabetes and hypertension (Silva et al., 2021). However, the lack of widespread internet access in rural regions remains a significant barrier to telemedicine adoption (Patel et al., 2021). Strengthening internet infrastructure could therefore enhance the reach of telemedicine services (Silva et al., 2021).

Electronic Health Records (EHRs) form another critical aspect of e-health initiatives. These replace traditional paper-based patient records with digital formats. EHRs are designed to provide healthcare professionals with real-time access to comprehensive patient information, such as medical histories, test results, and treatment plans (Sidorov, 2006). According to Buntin et al. (2011), the use of EHRs has been shown to improve the quality of care by reducing medication errors and facilitating better coordination between healthcare providers. However, challenges related to data privacy and interoperability between different systems remain a barrier to the full adoption of EHRs (Hersh, 2010). Liao et al. (2019) emphasise that EHRs improve data accuracy and facilitate seamless information sharing among healthcare providers. In Namibia, pilot projects involving EHRs have been introduced to streamline patient record management (Brown et al., 2022). These systems reduce the likelihood of medical errors by providing accurate and up-to-date patient information (Liao et al., 2019). Despite their potential benefits, challenges such as data security and high implementation costs have limited their adoption (Brown et al., 2022). Addressing these issues is crucial to realizing the full benefits of EHRs (Liao et al., 2019).

Mobile health (mHealth) applications are another focus of the current e-health initiatives, aiming to improve healthcare access through smartphones and mobile networks. Lee and Kim (2020) highlight that mHealth apps empower patients by providing health education, appointment scheduling, and medication reminders. In Namibia, MTC has supported the development of mHealth platforms to assist individuals in managing their health independently (Johansson & Lundberg, 2022). These apps are particularly beneficial in promoting maternal and child healthcare in underserved regions (Lee & Kim, 2020). However, low smartphone penetration in rural areas presents a barrier to widespread adoption (Johansson & Lundberg, 2022). Increasing smartphone accessibility could significantly enhance the impact of mHealth initiatives (Lee & Kim, 2020).

Public-private partnerships (PPPs) are essential for the success of the current e-health initiatives. According to Otieno and Wanyama (2020), collaborations between government agencies, private companies, and non-governmental organizations (NGOs) facilitate resource sharing and operational efficiency. In Namibia, MTC has partnered with the government to extend e-health services to rural areas (Patel et al., 2021). These partnerships ensure the scalability of e-health solutions while addressing financial and technical challenges (Otieno & Wanyama, 2020). Nonetheless, the success of PPPs depends on clearly defined roles and responsibilities among stakeholders (Patel et al., 2021). Strengthening these collaborations could enhance the effectiveness of e-health programs (Otieno & Wanyama, 2020).

Research revealed that capacity-building initiatives are an integral part of e-health programs. Johansson and Lundberg (2022) argue that training healthcare professionals in digital tools and technologies is crucial for the sustainability of e-health systems. In Namibia, efforts are being made to equip healthcare workers with the skills necessary to operate e-health platforms effectively (Zhang et al., 2020). These training programs enhance the confidence of healthcare providers in using technology, thereby improving service delivery (Johansson & Lundberg, 2022). However, the lack of continuous professional development opportunities limits the long-term impact of these initiatives (Zhang et al., 2020). Expanding training programs could address this gap and improve the overall performance of eHealth systems (Johansson & Lundberg, 2022).

2.2.3 Drivers and Barriers Towards Effective e-Health Implementation

The implementation of e-health systems is influenced by various drivers, including advancements in technology. According to Zhang et al. (2020), innovations such as cloud computing, artificial intelligence, and mobile health applications enable seamless healthcare delivery, particularly in resource-constrained environments. In many developing countries, technology adoption has improved the reach and quality of healthcare services (Liao et al., 2019). For instance, mobile health applications have allowed healthcare providers to monitor patients remotely, reducing the strain on physical healthcare facilities (Zhang et al., 2020). However, the availability of cutting-edge technology alone is insufficient without adequate infrastructure to support its implementation (Liao et al., 2019). This underscores the need for substantial investment in digital infrastructure to facilitate the adoption of e-health systems effectively (Zhang et al., 2020).

One of the primary barriers to effective e-health implementation is inadequate infrastructure. As highlighted by Silva et al. (2021), rural areas often lack the necessary broadband connectivity and power supply, which hinders the deployment of e-health solutions. In Namibia, limited access to stable internet networks remains a significant challenge for healthcare providers (Brown et al., 2022). Without robust infrastructure, e-health initiatives struggle to achieve their intended outcomes, particularly in underserved regions (Silva et al., 2021). Policymakers need to address these infrastructure gaps to ensure equitable access to healthcare services (Brown et al., 2022). These challenges demonstrate the importance of integrating infrastructure development into e-health strategies (Silva et al., 2021).

Human resource capacity is another critical driver that determines the success of eHealth initiatives. According to Otieno and Wanyama (2020), adequately trained healthcare professionals and IT specialists are essential for the operation and maintenance of e-health systems. The lack of skilled personnel is a widespread issue in many developing nations, including Namibia (Johansson & Lundberg, 2022). Training programs that equip healthcare workers with digital literacy and technical skills are critical to overcoming this barrier (Otieno & Wanyama, 2020). Additionally, fostering a culture of continuous learning can help bridge the knowledge gap in e-health technologies (Johansson & Lundberg, 2022). Addressing human resource deficiencies will significantly enhance the effectiveness of e-health implementations (Otieno & Wanyama, 2020).

Regulatory and policy frameworks also play a pivotal role in e-health implementation. Johansson and Lundberg (2022) emphasize that clear regulations governing data privacy, security, and interoperability are crucial for fostering trust in e-health systems. In many countries, including Namibia, unclear or restrictive policies can create hurdles for mobile network operators (MNOs) involved in e-health initiatives (Brown et al., 2022). Standardised regulations, aligned with international best practices, can mitigate these challenges (Johansson & Lundberg, 2022). Furthermore, simplifying compliance procedures can encourage more organizations to invest in e-health solutions (Brown et al., 2022). Robust regulatory frameworks are therefore essential for the successful implementation of e-health systems (Johansson & Lundberg, 2022).

Financial constraints remain one of the most significant barriers to effective e-health implementation. Patel et al. (2021) argue that the high initial costs associated with infrastructure and technology deployment can deter organisations from adopting e-health systems. Many MNOs in Namibia face similar challenges, as the financial burden often

outweighs the perceived benefits of eHealth investments (Silva et al., 2021). Governments and international organisations can play a critical role by offering subsidies or grants to support these initiatives (Patel et al., 2021). Furthermore, public-private partnerships (PPPs) have been shown to enhance financial sustainability in e-health projects (Silva et al., 2021). Addressing financial barriers is vital for ensuring the long-term viability of e-health systems (Patel et al., 2021).

Lastly, cultural and social factors significantly influence the acceptance and utilization of e-health systems. Lee and Kim (2020) noted that communities with limited digital literacy or scepticism toward technology are less likely to adopt e-health solutions. In Namibia, low levels of smartphone penetration in rural areas exacerbate this challenge (Johansson & Lundberg, 2022). Targeted awareness campaigns can help demystify e-health technologies and promote their benefits to the public (Lee & Kim, 2020). Additionally, involving community leaders in promoting e-health initiatives can enhance trust and acceptance (Johansson & Lundberg, 2022). Overcoming cultural barriers is essential for maximizing the reach and impact of e-health systems (Lee & Kim, 2020).

2.2.4 Strategic Interventions to Enhance e-Health Services

Strategic interventions play a critical role in enhancing e-health services by addressing barriers and optimising opportunities. Otieno and Wanyama (2020) argue that developing robust public-private partnerships (PPPs) can facilitate resource sharing, improve service delivery, and enhance scalability. These collaborations help to pool expertise, financial resources, and technological innovation, making eHealth more accessible (Johansson & Lundberg, 2022). In Namibia, organizations such as MTC could collaborate with government entities and NGOs to address infrastructure gaps and extend e-health services to rural areas (Otieno & Wanyama, 2020). Strong partnerships would enhance the efficiency and reach of e-health services (Johansson & Lundberg, 2022).

Infrastructure investment is another critical intervention required to enhance eHealth services. As highlighted by Silva et al. (2021), reliable internet connectivity and electricity are prerequisites for the successful implementation of e-health systems. In rural Namibia, many healthcare facilities lack the infrastructure needed to support e-health platforms (Patel et al., 2021). Investments in high-speed broadband networks and power supply would create a solid foundation for e-health services (Silva et al., 2021). Additionally, mobile operators like MTC could implement low-cost connectivity solutions tailored to underserved regions

(Patel et al., 2021). Addressing infrastructure challenges would significantly improve service delivery (Silva et al., 2021).

Capacity-building initiatives form another essential strategy for enhancing e-health services. Johansson and Lundberg (2022) emphasise that training healthcare providers in the use of digital tools are vital for ensuring the effectiveness of e-health systems. In Namibia, tailored training programs could empower healthcare workers to use telemedicine, electronic health records (EHRs), and mobile health applications efficiently (Zhang et al., 2020). Such programs should be continuous to accommodate technological advancements and evolving healthcare needs (Johansson & Lundberg, 2022). Enhancing digital literacy among healthcare workers would lead to better service quality, and improved patient outcomes (Zhang et al., 2020).

Implementing data security measures is crucial for ensuring trust in e-health systems. Liao et al. (2019) note that concerns about data privacy and security can hinder the adoption of digital healthcare solutions. Developing robust cybersecurity protocols such as encryption and access controls, would address these concerns (Lee & Kim, 2020). In Namibia, compliance with international data protection standards, such as the General Data Protection Regulation (GDPR), would improve user confidence in e-health services (Liao et al., 2019). Strategic investments in data security would protect sensitive information and encourage greater adoption of e-health platforms (Lee & Kim, 2020).

Financial incentives are another strategic intervention that can enhance e-health services. According to Patel et al. (2021), subsidies and tax breaks for mobile network operators and healthcare providers can reduce the financial burden of implementing e-health systems. In Namibia, government support for e-health projects could encourage private-sector investment (Silva et al., 2021). Incentivizing innovation and reducing operational costs would make e-health services more affordable and sustainable (Patel et al., 2021). Such measures could accelerate the adoption of advanced healthcare technologies, ultimately benefiting underserved communities (Silva et al., 2021).

The empirical literature has shown that community engagement is a vital strategic intervention for enhancing e-health services. Otieno and Wanyama (2020) stress that involving communities in the planning and implementation of e-health initiatives fosters trust and ensures relevance. In Namibia, engaging local leaders, healthcare users, and community organizations could provide valuable insights into specific healthcare needs

(Johansson & Lundberg, 2022). Tailoring e-health solutions based on community feedback would enhance their effectiveness and acceptance (Otieno & Wanyama, 2020). Strengthening community participation would ensure that e-health services address local challenges and improve healthcare outcomes (Johansson & Lundberg, 2022).

2.3 Types of e-Health Solutions

E-health solutions have become essential for improving healthcare access, efficiency, and quality. According to the World Health Organization (2016), e-health refers to the use of digital technologies to facilitate the management, delivery, and sharing of health information. One of the most common types of e-health solutions includes electronic health records (EHRs), which provide a digital version of patients' paper charts. EHRs offer several benefits, such as improved patient care coordination, reduced errors, and better clinical decision-making. This system allows healthcare providers to access patient information more quickly and accurately, improving the efficiency of diagnosis and treatment (Chauhan & Agarwal, 2020).

Telemedicine is another popular e-health solution that enables remote healthcare delivery. As noted by Gajarawala and Pelkowski (2021), telemedicine involves the use of telecommunication technology to provide clinical services from a distance. It can include video consultations, remote patient monitoring, and mobile health (mHealth) applications. Telemedicine has been particularly useful in rural and underserved areas, providing access to healthcare services that might otherwise be unavailable. By facilitating real-time communication between patients and healthcare professionals, telemedicine ensures that patients receive timely and appropriate care, regardless of geographical constraints (Hjelm, 2021).

Mobile Health (mHealth) applications are rapidly growing in popularity and are revolutionizing patient monitoring and health management. mHealth includes mobile applications that enable individuals to track their health metrics, such as steps taken, calories burned, and heart rate. According to Sherratt et al. (2020), mHealth solutions are valuable for chronic disease management, promoting healthy behaviours and improving patient engagement. These applications have the potential to enhance the self-management of chronic conditions such as diabetes, hypertension, and asthma by providing continuous monitoring and immediate feedback (Free et al., 2013).

Health information exchange (HIE) is another essential component of e-health systems. HIE systems allow for the secure sharing of health information across different healthcare organizations, enabling better coordination and continuity of care (Mertz et al., 2019). The goal of HIE is to ensure that critical health data is available wherever and whenever it is needed, which is especially important in emergencies. Mertz et al. (2019) highlight that HIE contributes to reducing redundant testing, minimizing medication errors, and enhancing patient safety by providing healthcare professionals with a comprehensive view of a patient's medical history, including lab results and prescriptions.

Decision support systems (DSS) are critical e-health solutions that assist healthcare providers in making informed decisions. According to Sim et al. (2018), DSS in healthcare often utilizes artificial intelligence (AI) and machine learning algorithms to analyse patient data and offer clinical decision recommendations. These systems provide healthcare professionals with insights that help improve diagnosis accuracy, treatment options, and patient outcomes. By integrating vast amounts of patient data, DSSs allow for evidence-based decision-making, which is especially helpful in complex medical cases (Soni & Garg, 2021).

2.4 The Role of Partnerships in Implementing e-Health Solutions

Partnerships are fundamental to the successful implementation of eHealth solutions, as they enable the pooling of resources, expertise, and innovation from diverse stakeholders. According to Kivunja and Kuyini (2017), collaboration between governments, healthcare organizations, and private sectors fosters the development of sustainable e-health systems. Governments play a critical role by providing policy frameworks and funding, while private companies contribute technological expertise and innovative tools such as telemedicine and electronic health records (EHRs) (Levine et al., 2021). These collaborations are particularly important in low-resource settings, where public-private partnerships (PPPs) can address infrastructure gaps and ensure the scalability of e-health initiatives (World Health Organization, 2020). By working together, stakeholders can align their goals to improve healthcare delivery and promote equitable access to digital health services.

In addition, partnerships facilitate knowledge exchange and capacity building, which are critical for the success of e-health projects. Yusif et al. (2017) highlight that, partnerships between technology companies and healthcare providers enhance technical training and support for healthcare workers, enabling them to adopt digital health tools effectively. Non-

governmental organizations (NGOs) also play a vital role by advocating for marginalized communities and ensuring that e-health solutions address their specific healthcare needs (Levine et al., 2021). For example, NGOs often act as intermediaries between local communities and larger institutions, bridging cultural and logistical gaps (WHO, 2020). Moreover, partnerships encourage innovation through co-creation, allowing stakeholders to design solutions tailored to unique healthcare challenges in different regions.

However, effective partnerships require mutual trust, shared goals, and accountability among stakeholders. Challenges such as competing priorities, lack of coordination, and resource constraints can hinder the success of e-health collaborations (Kivunja & Kuyini, 2017). Addressing these challenges requires clear communication channels, transparent governance structures, and regular monitoring and evaluation (Levine et al., 2021). Furthermore, policymakers must create an enabling environment that supports partnership formation and sustenance. Ultimately, fostering robust partnerships is a key determinant of the success and long-term sustainability of e-health solutions, particularly in regions with complex healthcare needs and resource limitations.

2.5 Factors Influencing e-Health Services Adoption

The adoption of e-health services is influenced by a variety of factors, including technological, organizational, and socio-economic elements. According to Venkatesh et al. (2003), one of the primary factors influencing e-health adoption is the perceived ease of use of technology. When healthcare professionals and patients believe that e-health systems are user-friendly, they are more likely to engage with these technologies. The complexity of a system can act as a significant barrier, preventing its widespread adoption. Thus, simplifying e-health interfaces and improving user experience is crucial for encouraging the use of digital health solutions (Buntin et al., 2011).

Another factor that impacts e-health adoption is the perceived usefulness of the technology. Davis (1989) defines perceived usefulness as the extent to which an individual believes that using a particular technology will enhance their performance. In the context of e-health, healthcare professionals are more likely to adopt technologies that can demonstrate a clear benefit in improving patient outcomes, reducing administrative burdens, or enhancing clinical efficiency. Studies have shown that the adoption of electronic health records (EHRs) is driven by the perceived ability of the system to improve care coordination and reduce medication errors (Chauhan & Agarwal, 2020).

Organizational support is also a critical factor in the adoption of e-health services. As noted by Buntin et al. (2011), healthcare institutions that provide adequate resources and training for their staff are more likely to succeed in the implementation of e-health solutions. Institutions that offer technical support, financial incentives, and continuous education to healthcare providers create an environment that fosters the adoption of digital health technologies. The leadership and vision of healthcare organizations also play a significant role in driving the adoption process (Gagnon et al., 2012).

The regulatory environment significantly impacts e-health adoption. Compliance with legal and regulatory frameworks such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States or the General Data Protection Regulation (GDPR) in the European Union is essential for ensuring data privacy and security. According to Hjelm (2021), stringent regulations can either facilitate or hinder the implementation of e-health services. Healthcare providers may hesitate to adopt e-health solutions if they are concerned about compliance with these complex regulatory standards, which can be costly and time-consuming to implement.

The socio-economic factors that influence e-health adoption include income levels, education, and access to digital technologies. According to Muench et al. (2017), individuals with higher income levels and better access to smartphones and the Internet are more likely to adopt mHealth and other e-health services. In contrast, people in lower-income regions or rural areas may face barriers to adoption due to the lack of infrastructure, limited access to technology, and digital literacy challenges. Ensuring equitable access to e-health solutions requires addressing these socio-economic disparities (Harris et al., 2020).

Cultural factors also play an important role in the adoption of e-health services. As discussed by Bhatti et al. (2019), cultural beliefs and attitudes toward technology can affect how healthcare providers and patients view e-health. In some cultures, there may be scepticism or distrust toward digital technologies in healthcare, which can impede adoption. Additionally, some patients and healthcare professionals may prefer face-to-face consultations over remote services. Understanding and addressing these cultural concerns is essential for fostering a positive reception toward e-health initiatives (Sartorius et al., 2020).

The availability of appropriate infrastructure and technical support is a key factor in adopting e-health services. According to Mertz et al. (2019), inadequate technological infrastructure,

such as poor internet connectivity, lack of devices, or outdated software, can create barriers to e-health adoption. This is particularly true in low-resource settings, where healthcare systems may lack the necessary technology to support e-health solutions. Ensuring robust infrastructure and ongoing technical support is critical for the successful implementation of e-health initiatives across different regions and healthcare settings (Lazarus et al., 2020).

2.6 Cultural or Societal Factors Affecting the Adoption of e-Health Initiatives

Cultural and societal factors play pivotal roles in the adoption and success of e-health initiatives. According to the WHO (2021), social acceptance of digital healthcare tools largely depends on cultural beliefs, practices, and norms regarding health and technology. In communities where traditional medicine is deeply rooted, there is often resistance to adopting digital health solutions due to mistrust or the lack of understanding of modern healthcare practices. Additionally, societal norms related to gender roles may impact the accessibility and utilization of e-health services, as women in some societies may face barriers in seeking healthcare independently or accessing technology-based services.

Health literacy is another critical societal factor influencing e-health adoption. A study by Chib et al. (2019) highlights that the lack of basic health and digital literacy among patients can impede the effective utilization of e-health platforms. For example, individuals who lack familiarity with smartphones or the internet may struggle to use mobile health (mHealth) applications, thereby limiting the reach of these technologies. Furthermore, healthcare providers may encounter challenges in introducing e-health solutions to patients who are unfamiliar with digital tools, as they must invest additional time and resources in educating and training users. This highlights the importance of tailored communication strategies to enhance adoption.

Socio-economic disparities also significantly impact e-health adoption, particularly in low-resource settings. As noted by Ojo (2018), affordability and access to digital devices are significant barriers in underprivileged communities. The high cost of smartphones, internet connectivity, and associated fees often restrict the adoption of e-health solutions to wealthier individuals, leaving marginalised populations underserved. Moreover, stigma or fear of judgment for using certain e-health services, such as mental health platforms, further discourages individuals from embracing these tools, especially in conservative societies where discussing mental health is taboo.

Lastly, trust and privacy concerns are prominent cultural and societal factors affecting e-health adoption. Kruse et al. (2016) note that many users hesitate to adopt e-health solutions due to fears about the confidentiality of their health data. This issue is specifically pronounced in societies where data breaches or misuse of personal information are common. Addressing these concerns requires building trust through transparent policies, robust cybersecurity measures, and culturally sensitive engagement strategies. Successful implementation of e-health initiatives depends on creating systems that align with societal values and foster trust among users.

2.7 Addressing Issues Related to Data Privacy and Security in e-Health Projects

Data privacy and security are pivotal to the success of e-health initiatives, as the confidentiality of patient information is a cornerstone of healthcare delivery. Studies by Kruse et al. (2016) emphasise that robust data protection mechanisms are essential to mitigate risks such as data breaches and unauthorized access, which can erode trust in e-health systems. With e-health platforms often relying on cloud-based solutions, ensuring compliance with international standards like the General Data Protection Regulation (GDPR) is critical. Lack of data encryption and weak access controls are common vulnerabilities that hinder the adoption of e-health solutions, particularly in developing countries (World Health Organization [WHO], 2021).

Healthcare organizations must adopt comprehensive cybersecurity frameworks to address these challenges effectively. Implementing advanced encryption techniques, multi-factor authentication, and regular security audits can significantly reduce vulnerabilities in e-health platforms (Alotaibi & Federico, 2017). Furthermore, engaging third-party cybersecurity experts to assess potential threats ensures proactive risk management. According to Panhuis et al. (2014), data security measures must extend beyond technical safeguards to include organizational policies and training programs aimed at enhancing staff awareness of cyber threats. These approaches ensure a balanced focus on both technology and human factors in securing patient data.

The rise of mobile health (mHealth) applications presents additional challenges to data privacy and security. Mobile devices are inherently vulnerable to cyber-attacks, particularly when operating over insecure networks or lacking updates. Abawajy et al. (2017) suggest that integrating privacy-by-design principles into mHealth app development can mitigate risks by embedding security features at the design stage. Moreover, fostering user education

on secure app usage, such as avoiding public Wi-Fi for health-related transactions, is crucial. These measures are vital in maintaining the integrity of sensitive health information accessed through mHealth platforms.

Finally, addressing data privacy concerns requires fostering transparency and building trust among stakeholders. Organizations must clearly communicate their data protection policies, including how patient information is collected, stored, and shared. Cavoukian (2019) emphasizes the importance of obtaining informed consent and offering patients control over their data. This transparency not only enhances trust but also aligns with ethical standards in healthcare. As the WHO (2021) highlights, trust in e-health systems is essential for their widespread adoption, making data privacy and security a fundamental priority in e-health project implementation.

2.8 Mobile Network Operators (MNO's)

Mobile Network Operators (MNOs) are organisations that provide wireless communication services such as phone calls, text messaging, and mobile data (Iyamu & Mgudlwa., 2018). MNOs own and operate the infrastructure required to provide these services, which include radio spectrum licenses, cellular towers, and network equipment. Nowadays MNOs are significantly investing in 5G infrastructure, which allows for greater data speeds and supports applications such as IoT and driverless vehicles. To cut expenses, some MNOs share infrastructure, particularly in less densely populated areas. MNOs frequently provide packages that incorporate mobile and home broadband, particularly in markets where fixed broadband access is common (Iyamu & Mgudlwa., 2018).

According to Shaika (2016) Namibia's mobile network operators offer various services, including voice, data, and mobile financial services. MTC (Mobile Telecommunications Limited), Namibia's largest and oldest mobile network operator, was founded in 1995. Ufitinema et al. (2020) posit that it provides broad 3G and 4G and expanding 4.5G/LTE coverage throughout the country. This approach supports Namibia's digital transformation goals and promotes connection in remote places. MTC offers both prepaid and post-paid plans, as well as mobile financial services like MTC Money (e-wallet).

Research reveals that Telecom Namibia (TN Mobile) is the country's principal fixed-line operator, but it also runs TN Mobile, the mobile branch. TN Mobile provides 3G, 4G, and LTE services, focusing on improving coverage to isolated and rural locations. It offers data and voice packages, in addition to broadband and LTE fixed wireless services. According to

Shaika (2016), Paratus Namibia began as an internet service provider and has expanded to provide mobile and wireless network services. It has a smaller mobile presence than MTC and TN Mobile, but it focuses on data solutions and enterprise connectivity. Paratus offers LTE broadband services, fibre, and satellite solutions geared towards urban regions and companies (Shanika., 2016). These operators have been investing in network expansion to improve connectivity, especially for rural and remote areas.

2.9 Benefits of E-Health

According to Iyamu and Mgudlwa (2020) among the benefits of e-health is accessibility. E-health improves access to healthcare services, particularly for those living in remote or underserved locations. E-health also brings efficiency to the health system. By automating administrative chores and enabling real-time data sharing, e-health saves time and resources for patient management (Ufitinema et al., 2016). There is patient engagement as e-health tools allow patients to actively participate in managing their health, resulting in improved self-care and preventive measures. Another benefit of e-health is data-driven insights where data analytics allow healthcare professionals to improve treatment outcomes, anticipate healthcare needs, and adapt interventions to people.

Blockchain technology has emerged as a promising solution for enhancing the security and privacy of health data in the digital age. According to Nakamoto (2008), blockchain operates as a decentralized, immutable ledger that ensures data integrity through cryptographic algorithms. In healthcare, where the confidentiality and accuracy of patient information are paramount, blockchain offers a secure method of storing and sharing health records. By using blockchain, healthcare providers can eliminate the risks of data tampering and unauthorized access, ensuring that patient data remains secure and accessible only to authorized parties (Azaria et al., 2016). The decentralised nature of blockchain also reduces the likelihood of system failures or attacks, as there is no central point of vulnerability (Zohar, 2015). Thus, blockchain can significantly improve data security, making it a valuable tool in e-health systems.

Moreover, blockchain can improve the interoperability of health data across various platforms while maintaining security. In traditional healthcare systems, data is often siloed in different systems, making it difficult for healthcare providers to access and exchange critical patient information. As noted by Yang et al. (2017), blockchain's decentralized model allows different healthcare entities to share health data securely in real-time, promoting

seamless information flow without compromising security. This capability could drastically reduce delays in treatment and enhance patient care. Additionally, blockchain enables patients to have greater control over their health data, empowering them to grant or revoke access to their medical records as needed (Borgohain et al., 2017). This level of control, combined with the enhanced security features, could address many concerns surrounding data breaches in healthcare.

2.10 Challenges of E-Health/Issues in E-Health

As empirically revealed, there are numerous challenges to e-health. These challenges include privacy and security concerns where if sensitive health data is maintained electronically, there is a high danger of breach and misuse. Ufitinema et al. (2020) posit that the digital divide arises when some groups may be unable to benefit from e-health because they lack internet access or digital literacy. Interoperability is another challenge where different healthcare systems must communicate seamlessly, which frequently means addressing compatibility concerns across various technologies and platforms (Scholtz et al., 2017).

Research reveals that, in Namibia, there is enormous potential to improve healthcare delivery using e-health, particularly given its large rural areas and inadequate healthcare infrastructure. However, several obstacles prevent e-health solutions from being effectively adopted and implemented. According to Odigie et al. (2012), there is limited infrastructure in Namibia to support e-health initiatives. Most Namibians reside in rural areas with scarce or unreliable internet access. Due to inadequate network coverage and slow internet speeds in these places, e-health solutions—which significantly depend on reliable internet access—face constraints. Also, many rural areas lack consistent electricity supply, which is critical for operating e-health equipment and devices. However, power outages are rare (Odigie et al., 2012).

Many healthcare professionals may lack the digital literacy needed to operate e-health technology efficiently, such as electronic health record (EHR) systems, telemedicine platforms, and other digital tools. Odigie et al. (2012) posit that patients' adoption and efficient use of e-health services may be hampered by low levels of digital literacy among the general population, especially in rural areas.

According to Shanika (2016), there are also high costs of implementation, maintenance, and ongoing. A substantial upfront expenditure is needed to establish e-health infrastructure,

which includes buying equipment, configuring systems, and educating medical personnel. Drury (2020) noted that upfront expenses are a significant obstacle because of Namibia's tight healthcare budget. There are ongoing expenses associated with e-health system maintenance, software updates, device repairs, and cybersecurity. Lack of financing for routine upkeep plagues many Namibian healthcare facilities, particularly those in rural locations.

Research reveals that cybersecurity and data privacy concerns are other challenges of e-health in Namibia. To guarantee privacy, e-health systems handle sensitive patient data, which needs to be secured. Drury (2020) argued that establishing strong data protection procedures and policies to stop illegal access to medical records is a challenge for Namibia. Healthcare information systems are becoming vulnerable to cyberattacks as they become more digitalised (Lu et al., 2019). Technical know-how and funding are needed to ensure cybersecurity, but both are frequently scarce in Namibia.

Dahal et al., (2016) posit that Namibia faces the challenge of the lack of clear e-health regulations. Namibia has little or no e-health-specific rules. Legal ambiguity results from developing issues including interoperability standards, data protection regulations, and telemedicine licensing. It might be difficult to integrate e-health technologies with the current healthcare policies. Although it can be difficult to do, coordination between private e-health providers, ICT departments, and health ministries is necessary (Dahal et al., 2016). Some medical practitioners can object to the move to digital health solutions because they prefer more conventional approaches. This resistance may stem from a lack of familiarity with technology, worries about taking on more labour, or doubts about the efficacy of e-health (Justice., 2020).

Research shows that medical instruments that facilitate remote diagnosis, such as portable imaging equipment and digital stethoscopes, are critical to the success of telemedicine. These gadgets are not often accessible in Namibia and are frequently expensive. Despite having internet access, Namibia still lacks specialised diagnostic tools and medical supplies, which are essential for e-health projects to be successful (Swanepoel et al., 2022).

Health information systems used by different regions and healthcare providers may not be incompatible with each other (Swanepoel et al., 2022). The smooth transfer of patient data between healthcare providers is hampered by this lack of interoperability. It can be difficult to guarantee uniformity among e-health systems to facilitate effective data integration and

sharing. Coordination between healthcare facilities is hampered because data interchange is complicated by the lack of uniform standards (Swanepoel et al., 2022).

2.11 Potential Solutions to Overcome These Challenges

Research shows that to overcome these obstacles and create a strong, long-lasting e-health ecosystem in Namibia, a concerted, multi-stakeholder strategy is needed. The issues in e-health mentioned above can therefore be mitigated by investing in infrastructure that can increase access to e-health by guaranteeing dependable power sources and enhancing internet connectivity, particularly in remote areas, educating the public and healthcare professionals to become more digitally literate and accustomed to e-health systems, developing and enforcing e-health policies, regulations, and cybersecurity standards which can create a safer and more supportive environment for e-health and collaboration between the government and private sector which can help alleviate funding issues and provide expertise in implementing e-health solutions.

Another potential solution to overcome the challenges of data security in e-health systems is the implementation of advanced encryption technologies. According to Radanliev et al. (2019), strong encryption methods such as end-to-end encryption can protect sensitive health data during transmission and storage. This ensures that even if unauthorized parties gain access to the data, it remains unreadable without the decryption key. Moreover, using multi-factor authentication (MFA) systems can further enhance the security of patient information by adding a layer of protection, as suggested by Patel et al. (2020). This combination of encryption and MFA can significantly reduce the risk of data breaches and unauthorized access to health records.

Research has shown that the adoption of blockchain offers a potential solution to the challenges of e-health and managing health data. Azaria et al. (2016), notes that blockchain offers a decentralised approach that ensures data integrity and privacy, making it an ideal solution for healthcare systems. The immutability of blockchain records ensures that once data is entered, it cannot be altered or tampered with, thus maintaining its authenticity. Additionally, blockchain can provide patients with control over their data, allowing them to grant or revoke access permissions at their discretion (Zohar, 2015). By integrating blockchain into e-health systems, healthcare providers can address many security and interoperability challenges, while improving trust between patients and providers.

Research reveals that regulatory frameworks need to be strengthened to support secure e-health data management. As pointed out by Sharma and Singh (2018), clearer policies and standards for data protection can guide the implementation of secure e-health solutions. Governments and regulatory bodies should work with healthcare providers and technology companies to establish comprehensive security guidelines and compliance requirements that safeguard patient data. Additionally, continuous monitoring and auditing mechanisms can be implemented to ensure compliance with these regulations and address emerging threats (Borgohain et al., 2017). This collaborative effort can provide a solid foundation for the secure implementation of e-health systems.

2.12 Empirical Literature Review

Several empirical studies have been conducted globally to investigate factors influencing mobile network operators (MNOs) in e-health systems. In Ghana, a study by Asare et al. (2020) explored the challenges of integrating mobile networks into e-health systems. The researchers employed a mixed-methods approach, combining surveys and interviews with stakeholders, including healthcare providers and mobile operators. The population consisted of 2,000 participants, with a sample size of 300 selected using stratified random sampling. The study found that 60% of MNOs struggled with inadequate infrastructure, and 45% identified regulatory challenges as a significant barrier to implementing e-health solutions.

Similarly, in India, Patel et al. (2021) examined the financial implications of e-health partnerships for MNOs. The study analysed financial data from 20 mobile operators using the quantitative approach. The population consisted of all operators engaged in e-health collaborations, with a sample size of 15 selected based on revenue generation. The findings revealed that while MNOs experienced an initial decline in profit margins due to infrastructure investments, they reported a 25% increase in revenue within three years of implementing e-health systems. The study underscored the importance of long-term financial planning for successful MNO participation in e-health.

Moreover, in Kenya, a qualitative study by Otieno and Wanyama (2020) investigated the impact of public-private partnerships (PPPs) on e-health initiatives. The researchers conducted focus group discussions and in-depth interviews with a population of 150 stakeholders, including government officials, healthcare providers, and MNO representatives. A purposive sample of 50 participants was selected. The study revealed

that PPPs significantly enhanced the scalability of e-health services, with 80% of participants emphasising the importance of collaborative funding and resource sharing to address operational challenges faced by MNOs.

Additionally, in Sweden, Johansson and Lundberg (2022) conducted a study on the role of data security and privacy in influencing MNOs' engagement in e-health. Using a survey-based methodology, the researchers targeted a population of 500 IT managers from healthcare institutions and MNOs, selecting a sample of 200 through simple random sampling. The study found that 78% of respondents identified compliance with the General Data Protection Regulation (GDPR) as a critical factor affecting their willingness to invest in e-health systems. The study concluded that regulatory compliance frameworks must be simplified to encourage greater MNO participation.

A study conducted in Brazil by Silva et al. (2021) focused on the technological challenges MNOs face in supporting e-health systems in underserved regions. The researchers used a case study approach, analysing three large-scale e-health projects in rural areas. The population included 500 healthcare workers and technicians, with a sample size of 120 selected through convenience sampling. Findings indicated that 70% of the healthcare facilities lacked the necessary infrastructure to support e-health services, leading to inconsistent service delivery. The study emphasised the need for government subsidies to bridge technological gaps in rural areas.

In South Korea, Lee and Kim (2020) examined the influence of smartphone penetration on the success of e-health systems supported by MNOs. The researchers employed a cross-sectional survey targeting 1,000 individuals from urban and rural areas, with a final sample size of 400 chosen using quota sampling. The findings revealed that regions with higher smartphone penetration reported a 40% greater adoption of e-health services. The study concluded that increasing smartphone accessibility is vital for enhancing the effectiveness of MNOs in e-health systems.

Finally, in Canada, Brown et al. (2022) investigated the role of interoperability in shaping MNOs' engagement in e-health systems. Using a mixed-methods approach, the study included surveys and interviews with 300 IT professionals and healthcare administrators. The sample size of 120 was chosen through stratified sampling. Findings showed that 65% of participants faced challenges integrating MNO networks with existing healthcare IT systems. The study recommended the development of standardized protocols to facilitate seamless data exchange between MNOs and healthcare providers.

Despite the potential of e-health, several technological factors and infrastructure limitations hinder its widespread adoption in developing nations like Namibia. Several studies indicated that MNOs face challenges in expanding mobile health services to rural areas due to inconsistent network coverage and the high cost of maintaining infrastructure in geographically remote regions (MTC Namibia, 2022). Additionally, many rural populations rely on basic feature phones with limited access to high-speed data, further constraining the effectiveness of mobile health applications (Okpechi, Rayner & Swanepoel, 2022).

Market and economic factors are crucial determinants for the success of e-health solutions. High costs associated with data and mobile services act as barriers for many users, particularly in low-income communities. This economic divide limits the reach of e-health solutions, particularly in rural Namibia (Republic of Namibia, 2020). A study by Iyamu and Shaanika (2020) identified that the user-friendliness of mobile systems and the training provided to healthcare practitioners significantly influence the adoption of mobile healthcare services in public hospitals. Collaborative efforts and partnerships between MNOs, healthcare providers, and the government can alleviate some of these challenges. The establishment of PPPs has been shown to improve service delivery by combining the technical infrastructure of MNOs with government funding and healthcare expertise (Iyamu & Shaanika, 2020). Collaborative models enable the pooling of resources, which is especially critical in resource-constrained environments like Namibia. Finally, the barriers and challenges to e-health implementation include limited digital literacy among healthcare providers and patients, lack of interoperability between healthcare systems, and concerns regarding data privacy and security (Nengomasha et al., 2018).

2.13 Mobile Telecom Communications (MTC) Limited Namibia and e-Health

Research reveals that the e-health role of Namibia is an important illustration of how telecommunications may have a big impact on healthcare. Namibia's healthcare issues, especially in rural regions, are being addressed by MTC through the promotion of mobile health applications, support for digital health records, and telemedicine. E-health projects spearheaded by MTC have the potential to significantly revolutionise Namibia's healthcare scene as connectivity increases and digital literacy advances (Shanika., 2016). As part of its larger goal to promote digital transformation and enhance access to necessary services nationwide, Namibia's Mobile Telecommunications Limited (MTC) actively supports e-health programs (Scholtz., 2017). Like many other nations, Namibia has difficulties providing healthcare, particularly in rural and isolated areas with limited access to medical experts and

infrastructure. MTC contributes significantly to e-health solutions that try to get beyond these challenges by utilising its telecommunications network.

According to Shanika (2016) the telecom infrastructure of MTC enables telemedicine, allowing patients in remote areas to access medical consultations without needing to travel to urban healthcare centres. MTC effectively expands access to vital health services by bridging the gap between patients and healthcare providers through virtual check-ups, real-time patient monitoring, and video conferencing. In Namibia, where certain areas lack specialists and healthcare facilities can be far apart, these services are essential. Elkaseh et al., assert that (2016) MTC supports digital health record solutions, which increase patient data management's accuracy and efficiency. This makes it simple and safe for medical personnel to view and exchange patient records, which is particularly helpful when patients need to be transferred between different hospitals. Better data management via digital platforms minimises errors, cuts down on paperwork, and facilitates health systems' ability to monitor and control health outcomes over time (Elkaseh et al., 2016).

MTC works with healthcare professionals to provide mobile health applications that deliver disease prevention updates, prescription reminders, and health information. These applications can be extremely helpful for managing chronic illnesses, promoting preventive health practices, and educating people about health issues. Patients, particularly those living in rural areas where access to healthcare education may be limited, can benefit greatly from the low-cost and efficient information delivery provided by mHealth applications (Scholtz et al., 2017). MTC has also participated in campaigns to increase public awareness of important health issues as COVID-19, TB, and HIV/AIDS. MTC's network offers Namibians the most recent information, preventative actions, and tools to seek additional medical assistance, if necessary, through SMS notifications, mobile apps, and social media. According to Scholtz et al., (2017) to guarantee dependable connectivity for medical facilities in underserved and rural locations, MTC is also actively working to expand network coverage in these areas. These facilities can now take advantage of e-health technologies including patient monitoring, remote diagnostics, and access to health information systems thanks to the increased connectivity (Scholtz et al., 2017).

2.14 E-Health Systems in South Africa

E-health systems in South Africa have rapidly developed over the past decade, aiming to improve healthcare delivery through technology integration. According to Hagg et al. (2021),

South Africa's e-health initiatives, such as the implementation of electronic health records (EHRs) and telemedicine services, have been pivotal in addressing healthcare accessibility challenges. These systems have enabled healthcare providers to deliver services remotely, particularly in rural areas where healthcare infrastructure is limited. Despite the positive impact, the adoption rate has been slow, primarily due to inadequate infrastructure, lack of digital literacy among healthcare professionals, and regulatory barriers (Moses & Peters, 2020).

In addition to infrastructure challenges, South Africa's e-health systems face issues related to data security and privacy. The country's Health and Digital Transformation strategy, outlined by Moodley and O'Neil (2021), emphasize the need for secure digital platforms that ensure patient confidentiality and data protection. With the rise of cyber threats and data breaches globally, the integration of robust cybersecurity measures has become crucial. However, studies suggest that many healthcare facilities in South Africa lack the necessary resources to implement effective data protection strategies (Van der Merwe et al., 2019).

To enhance e-health implementation in South Africa, several strategies have been proposed, including public-private partnerships and government-led digital health initiatives. According to KPMG (2020), collaboration between the government, private sector, and technology providers can accelerate the development and implementation of e-health solutions. These partnerships aim to address the country's health service delivery gaps by improving connectivity, training healthcare workers in digital tools, and expanding telemedicine networks. Additionally, fostering innovation through local start-ups could contribute to creating context-specific e-health solutions tailored to the needs of South Africa's diverse population (Booyesen et al., 2020).

2.15 Factors Driving Focus on e-Health

The global shift toward digital health technologies has been primarily driven by the need to address healthcare accessibility and efficiency challenges. In low- and middle-income countries like Namibia, e-health is increasingly recognized as a transformative solution for overcoming geographic and resource barriers. Telecommunication companies are pivotal in this transformation due to their extensive infrastructure and expertise. For instance, the World Health Organization (WHO) (2020) highlights the critical role of digital technologies in enhancing healthcare delivery, particularly in underserved regions. Telemedicine, electronic health records (EHRs), and mobile health (mHealth) applications are some examples of how

e-health technologies are being implemented to improve patient outcomes and streamline healthcare systems.

Governmental policies and strategies play a significant role in driving the adoption of e-health. In Namibia, the government's digital transformation agenda emphasises the integration of digital solutions to enhance healthcare access, particularly in rural areas. According to Levine et al. (2021), public-private partnerships are instrumental in achieving national healthcare goals by leveraging the expertise and resources of both sectors. Telecommunications providers, such as MTC, align their e-health initiatives with governmental priorities to support universal healthcare access. This alignment ensures that e-health programs are not only technologically innovative but also responsive to local healthcare needs and priorities.

Market demand and technological advancements are also significant drivers of e-health adoption. As the penetration of smartphones and internet connectivity grows, more patients and healthcare providers are adopting digital health platforms. Research by Kivunja and Kuyini (2017) indicates that the increasing adoption of mHealth applications reflects a broader trend of consumer-driven healthcare, where patients seek more control over their health and wellness. Telecommunication companies respond to this demand by investing in scalable and user-friendly platforms that enhance patient engagement and satisfaction. This market-driven approach ensures that e-health solutions remain relevant and effective in addressing emerging healthcare challenges.

Finally, the role of international trends and funding cannot be overlooked in driving e-health initiatives. Many e-health programs in developing countries are supported by international organisations and donors who view digital health as a sustainable approach to achieving health equity. Yusif et al. (2017) emphasise that the global focus on digital health as part of the Sustainable Development Goals (SDGs) has encouraged countries to prioritize e-health in their healthcare strategies. For telecommunication providers like MTC, this global momentum provides an opportunity to align their initiatives with international best practices and funding opportunities, further strengthening their position as leaders in e-health innovation.

2.16 The Influence of Government's Digital Transformation Agenda on e-Health Initiatives

Governments globally are prioritising digital transformation agendas to modernize public service delivery, including healthcare systems. These agendas often emphasize the adoption of e-health technologies as a means to address healthcare inequities and improve accessibility. According to the World Health Organization (WHO) (2020), integrating digital health solutions into national healthcare systems enhances efficiency, especially in low- and middle-income countries. Governments provide regulatory frameworks and financial incentives to encourage the adoption of technologies like telemedicine, electronic health records (EHRs), and mobile health (mHealth) platforms. Such initiatives align healthcare reforms with broader national goals of technological advancement and universal healthcare access.

In Namibia, the government's commitment to digital transformation has significantly influenced the trajectory of e-health initiatives. The Ministry of Information and Communication Technology (MICT) supports partnerships between public institutions and private entities like Mobile Telecommunications Limited (MTC) to drive digital healthcare innovations. Levine et al. (2021) highlight that when governments actively promote e-health within their digital transformation strategies, they create a conducive environment for innovation and investment. For instance, Namibia's Vision 2030 emphasises leveraging technology to ensure equitable healthcare delivery, making e-health an essential component of its national health strategy.

Additionally, the government's role in funding and capacity-building is critical for the success of e-health programs. Governments in developing countries often rely on international funding and donor support to implement digital health technologies. According to Yusuf, Hafeez-Baig, and Soar (2017), the involvement of governments in coordinating such efforts ensures that e-health solutions are aligned with national healthcare priorities. Namibia's government, through partnerships with global organisations, has secured resources for e-health projects, fostering the adoption of digital health tools such as virtual consultations and real-time patient monitoring, particularly in underserved areas.

Policy and legislative frameworks introduced as part of digital transformation agendas also shape the implementation of e-health. Robust policies addressing data privacy, security, and interoperability are vital for fostering trust in digital healthcare solutions. As noted by Kivunja and Kuyini (2017), regulatory clarity enables telecommunications companies like MTC to

align their e-health offerings with legal and ethical standards, ensuring user confidence and compliance. In Namibia, government policies mandating secure data practices have encouraged the development of reliable e-health platforms that prioritize patient confidentiality while delivering efficient healthcare services.

2.17 Namibia's Health System

The Ministry of Health and Social Services (MoHSS) is largely in charge of overseeing Namibia's health system, which combines public and private healthcare services (Shaanika., 2016). Namibia's healthcare system, like many others in Sub-Saharan Africa, has its own set of problems, including poor infrastructure in rural regions, a lack of medical experts, and geographic limitations, but it has also made significant strides in several public health domains.

The public sector is the largest supplier of healthcare services, offering services to about 85% of the population (Shaanika., 2016). It functions through a nationwide network of clinics, hospitals, and health facilities, many of which offer free or inexpensive services. Primary healthcare facilities offer the first line of care in the public system, which is divided into various levels of care. District hospitals and regional referral hospitals provide more specialised care. Shaanika (2016) asserted that 15% of the population is covered by private health insurance, which is mostly provided to urban regions and those who can afford it. Despite frequently having better resources and shorter wait times than public facilities, private healthcare is typically more expensive. Healthcare is delivered through private hospitals and clinics, which are mostly located in cities like Windhoek, and a few private medical plans and insurance companies are in operation. In rural locations, community health professionals are crucial because they help with basic healthcare and preventive care (Shaanika., 2016). Although it is not entirely incorporated into the national health system, traditional medicine is also practiced.

2.18 Theoretical Framework Review

Creswell and Creswell (2018) noted that a theoretical literature review is a type of literature review that examines and synthesises ideas, frameworks, and models relevant to a particular research topic. It assesses and synthesises accepted concepts and theoretical viewpoints as opposed to emphasising empirical research, which involves gathering and analysing facts. Its goal is to make clear the conceptual approaches taken by earlier researchers on a subject and to point out any theoretical gaps or inconsistencies that might

be filled by further study. The current study theorised on Diffusion Innovation Theory and The Unified Theory of Acceptance and Use of Technology. These two theories shaped this study by providing theoretical lenses upon which mobile health solutions are adopted within healthcare, focusing on factors like relative advantage and complexity.

2.18.1 The Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) Theory, proposed by Rogers (2003), provides a framework for understanding how innovations in e-health, such as mobile health services, spread within healthcare systems. Understanding diffusion helps in promoting health innovations (like vaccinations) by targeting early adopters and opinion leaders to influence community norms. In the context of e-health in Namibia, the adoption of mobile health solutions is heavily influenced by these factors, particularly in rural areas where infrastructure challenges persist (Iyamu & Shaanika, 2020). The Technology-Organisation-Environment (TOE) Framework, introduced by Tornatzky and Fleischer (1990), is also relevant to e-health adoption by mobile network operators (MNOs) like MTC. This framework highlights three critical aspects—technological, organisational, and environmental factors—that shape how firms adopt and implement technological innovations. In addition, the Public-Private Partnership (PPP) Theory underlines the importance of collaboration between governments and private MNOs like MTCs for the successful implementation of e-health initiatives.

Namibia is modestly prepared to adopt e-health innovations, with promising initial initiatives linked with the DOI model. Namibia has committed to using ICT to enhance healthcare delivery. Key initiatives include Electronic Health Records (EHRs) piloted in public hospitals, Telemedicine programs for remote consultations, mHealth apps supporting maternal health and disease surveillance and partnerships with international agencies (e.g., WHO, UNICEF, and USAID). The major key gaps are that digital infrastructure, that is, internet and power access in rural areas remain weak. In terms of human capacity, there is limited ICT training among healthcare providers. Data privacy laws and interoperability standards still evolving and there is limited engagement of end-users in design and implementation. However, in order to secure long-term and widespread adoption, inclusive communication, infrastructure development, and community-led implementation must be prioritised. Namibia can speed the adoption of digital health technologies across all sectors of its healthcare system by adopting DOI theory in a more comprehensive manner.

2.18.2 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was introduced by Venkatesh et al. (2003) to explain what influences people to accept and use new technology. This theory identifies four main factors: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance Expectancy (PE) refers to the belief that using technology will improve outcomes or make tasks easier. In Namibia, demonstrating the positive impact on patient outcomes (e.g., reduced referral times) can enhance PE. However, health workers may doubt the usefulness of e-health systems, especially in rural areas where digital literacy is low and some e-health platforms may not yet demonstrate clear time-saving or diagnostic advantages.

Effort Expectancy (EE) is about how easy the technology is to use. Social influence involves the pressure or encouragement people feel from others to use the technology. Facilitating conditions are the resources and support available to help people use the technology effectively. In the case of Namibia's e-health, designing localized, multilingual, and user-friendly interfaces (e.g., in Oshiwambo, Nama) can reduce perceived effort. Proper training and support can significantly improve perceived ease of use. The problems are that lack of ICT skills among health workers can make new systems feel burdensome and language barriers and system complexity might hinder usability.

According to Venkates et al. (2003), the Unified Theory of Acceptance also considers individual differences, like age, gender, experience, and voluntariness of use which can affect how these factors influence technology adoption. Patel et al. (2021) explained that in the context of e-health systems, a doctor might be more likely to use mobile health tools if they believe it will improve patient care, find it easy to learn, feel supported by their peers, and have access to training and reliable internet. This theory is widely used to understand technology adoption in various fields, including healthcare, education, and business (Otieno and Wanyama., 2020).

UTAUT provides a structured approach to analyze the adoption of e-health in Namibia. Stakeholders (such as the Ministry of Health, NGOs, and developers) must address all four fundamental structures, take moderating factors into account, and customise solutions to Namibia's socio-technical environment for successful implementation. This entails adapting training locally, creating mechanisms for environments with limited resources, and gaining support and trust by solid leadership and proven advantages.

2.19 The Research Gap

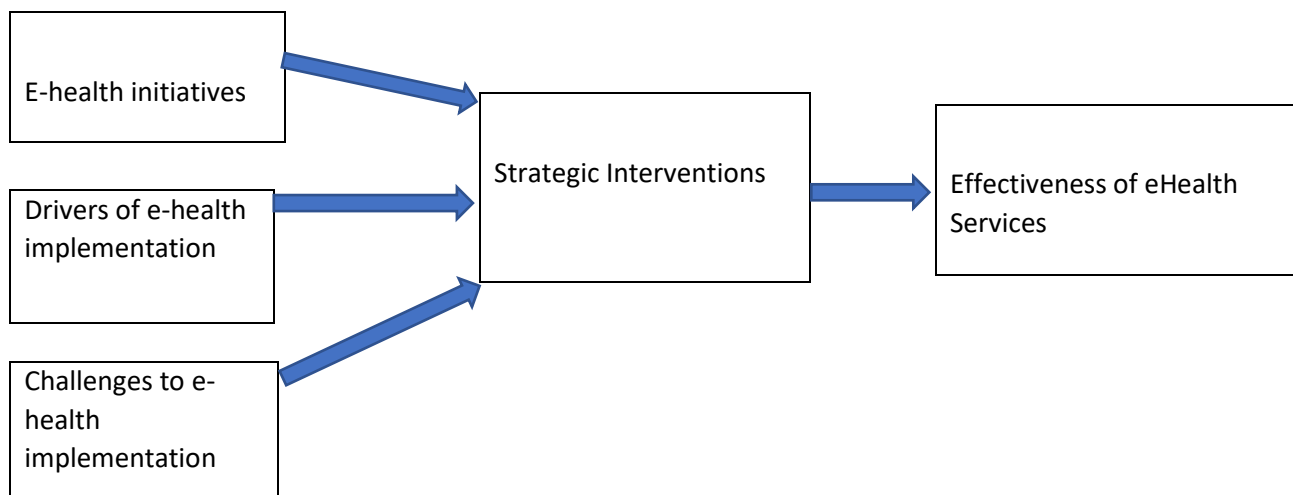
The research gap identified in the empirical studies is the lack of specific focus on the factors influencing mobile network operators (MNOs) in the context of e-health systems within Namibia, a region with distinct socio-economic, regulatory, and technological conditions. While global studies have explored various challenges such as infrastructure, regulatory issues, public-private partnerships, and data security, there is insufficient research addressing these factors within Namibia's unique environment. Additionally, there is a limited exploration of how MNOs can adopt strategic interventions to enhance e-health services in developing regions. This research aims to close this gap by focusing on Namibia's specific challenges and opportunities, providing insights into drivers and barriers for MNOs, and offering actionable strategic interventions to improve the implementation of e-health systems in the country.

2.20 Conceptual Framework

The conceptual framework for the study on factors influencing mobile network operators (MNOs) in e-health systems illustrates the relationship between key variables impacting MNOs' participation in e-health initiatives. This framework is developed based on empirical literature, identifying dependent, independent, and moderating variables.

Independent variables

Dependent variable



2.21 Chapter Summary

The Chapter highlighted the research's supporting literature. The literature was drawn from various concepts that were linked to the topic under study. These included the theoretical

framework which explained theories such as The Diffusion of Innovation (DOI) theory and The Unified Theory of Acceptance and Use of Technology (UTAUT). The theories were necessary for providing clarity to the study. The Chapter also explained mobile network operators and linked it to e-health. Included in the chapter is also the study's conceptual framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the methodical and theoretical examination of the approaches used in a field of study. It is a way of explaining how a researcher intends to carry out research and hence it is a logical, systematic plan to resolve a research problem. It includes the methods and procedures used by researchers to find, pick, process, and evaluate data related to the research subject. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives. Selecting a framework for research methodology that supports the goals of the study and aids in producing accurate and legitimate data is essential. This Chapter highlights the research methodology that was included in the present study.

3.2 Research Philosophy

Research philosophy refers to the set of beliefs and assumptions about how knowledge is developed, interpreted, and applied in a study (Saunders et al., 2019). It guides the researcher's decisions regarding methodology, data collection, and analysis, shaping the overall direction of the research. These beliefs often stem from a researcher's view of reality (ontology) and how knowledge is gained (epistemology) (Creswell & Creswell, 2018). Understanding research philosophy is essential as it ensures coherence between the research objectives and the methods used to achieve them.

3.2.1 Positivism

Positivism emphasises objectivity and the use of scientific methods to observe and measure phenomena. Researchers adopting this approach believe that reality is external and can be studied independently of personal perspectives (Bryman, 2016). Positivists often rely on quantitative methods such as experiments and surveys to generate measurable and testable data (Saunders et al., 2019). Consequently, a positivist researcher studying e-health systems would collect numerical data on patient outcomes to evaluate the effectiveness of digital interventions. This approach prioritises validity and replicability, aiming to uncover universal truths.

3.2.2 Interpretivism

Interpretivism, in contrast, focuses on understanding the subjective meanings individuals attach to their experiences and social contexts (Creswell & Poth., 2017). This philosophy is rooted in the belief that reality is socially constructed and cannot be separated from human perceptions and interactions (Bryman, 2016). Interpretivist researchers often use qualitative methods, such as interviews or focus groups, to explore complex phenomena in depth. For instance, an interpretivist might examine how healthcare providers perceive and adapt to e-health technologies in their practice. This approach seeks to provide rich, contextual insights rather than generalised conclusions (Creswell & Creswell, 2018).

3.2.3 Adopted Research Philosophy

The current research adopted an interpretivism philosophy, which is suitable for studies that focus on understanding the subjective experiences and meanings that individuals assign to their social and organisational contexts. In this case, interpretivism allowed for a detailed exploration of how stakeholders such as MTC's employees, healthcare providers, and patients perceive the role of mobile network operators in e-health systems. This philosophy supports the use of qualitative methods to gather insights from participants' perspectives, which is essential in understanding the factors influencing the adoption and implementation of e-health in Namibia. Interpretivism was appropriate for this study because it acknowledges that reality is socially constructed and that understanding the role of MTC in e-health systems requires interpreting the lived experiences and perceptions of those involved (Bryman, 2016). The approach enables the research to focus on the human aspects, such as perceptions, behaviours, and interactions, within the broader context of e-health, allowing for a rich, in-depth understanding of the challenges and opportunities.

By using an interpretivism philosophy, the study explores qualitative data (such as interviews and focus groups) to understand how individuals make sense of e-health initiatives, providing insights that are grounded in their personal experiences and social contexts (Creswell, 2013). This makes interpretivism particularly suited for investigating complex, context-dependent issues like e-health implementation in Namibia.

3.3 Research Approach

Research approach refers to the plan and procedure for conducting research, encompassing the steps from broad assumptions to detailed data collection and analysis methods (Creswell & Creswell, 2018). It provides a framework that guides researchers in

systematically addressing research problems while ensuring that methods align with the research objectives. Research approaches are broadly categorised into two: qualitative and quantitative approaches.

3.3.1 Qualitative Approach

The qualitative approach focuses on understanding phenomena through the exploration of participants' experiences, opinions, and emotions in natural settings (Flick, 2018). This approach often employs methods such as interviews, focus groups, and observations, aiming to gather non-numeric data that provides deep insights. Saunders et al. (2019) noted that the qualitative research might explore the subjective experiences of patients using e-health services. The approach is interpretive and inductive, where theories emerge from the data collected rather than being predetermined. It is suitable for research aiming to explore new or under-researched areas (Creswell & Creswell, 2018).

3.3.2 Quantitative Approach

On the other hand, the quantitative approach relies on numerical data to analyse patterns, relationships, and causality between variables (Bryman, 2016). This approach typically involves the use of surveys, experiments, or statistical analysis tools, providing objective and generalizable results. For instance, a study might measure the adoption rates of e-health systems among healthcare providers using statistical models. The quantitative approach is deductive, testing hypotheses based on existing theories. It is particularly effective for research requiring measurable and comparable data (Flick, 2018).

3.3.3 Mixed Research Approach

The mixed research approach integrates qualitative and quantitative methods to provide a comprehensive understanding of a research problem (Creswell, 2021). It combines the strengths of both approaches, using qualitative methods to explore phenomena and quantitative methods to validate findings. According to Bryman (2020) a study may use interviews to identify key factors to measure their prevalence and impact. This approach allows for triangulation thus enhancing the validity and reliability of the findings. Mixed methods are particularly useful for addressing complex research questions requiring multiple perspectives (Saunders et al., 2019).

However, both approaches can be used independently and combined in a mixed-methods framework to enrich research outcomes. According to Saunders et al. (2019) the choice of approach depends on the nature of the research questions and the objectives of the study.

3.3.4 Adopted Research Approach

Three main reasons justify the adoption of a qualitative approach in this study. First, qualitative research enables the collection of detailed, context-rich data that helps to uncover the factors influencing e-health systems. It allows the study to explore not just what happens but also why it happens, focusing on participants' perspectives and experiences (Denzin & Lincoln, 2011). Second, since the research seeks to understand perceptions, barriers, and drivers related to e-health, qualitative methods such as interviews and focus groups are ideal for capturing the subjective insights of stakeholders, which are critical for understanding the factors at play (Bryman, 2016). Third, a qualitative approach provides flexibility in data collection, allowing the researcher to adjust the study based on the emerging insights from participants, which is important for exploring complex, real-world issues like e-health implementation in a developing country context (Yin, 2018).

3.4 Research Design

According to Creswell and Creswell (2018) a research design refers to the overall strategy or blueprint that guides the process of collecting, analysing, and interpreting data in a research study. Saunders et al. (2019) noted that a research design ensures that the research problem is effectively addressed by defining the methods and procedures for conducting the study. A well-constructed research design aligns the research objectives, methodology, and data collection techniques to produce credible and reliable findings. Brandon (2022) noted that there are three main approaches to research design including the exploratory, descriptive, and explanatory research designs.

3.4.1 Exploratory

The exploratory research design aims to investigate phenomena that are not well understood, focusing on generating insights and understanding rather than testing hypotheses (Saunders et al., 2019). This approach is typically qualitative, involving methods such as interviews, focus groups, and literature reviews. For instance, exploratory design could be used to understand perceptions of e-health adoption in rural communities. It is flexible and adaptive, making it suitable for areas with limited prior research (Creswell & Creswell, 2018).

3.4.2 Descriptive

The descriptive research design seeks to provide a detailed and accurate account of a phenomenon by systematically describing it (Bryman, 2016). This approach can involve both qualitative and quantitative methods, such as surveys and case studies. Descriptive design is often employed to study characteristics, behaviours, or trends, such as the rate of e-health adoption among healthcare providers. It focuses on answering the "what" and "how" questions without delving into causal relationships (Saunders et al., 2019).

3.4.3 Explanatory

The explanatory research design aims to establish cause-and-effect relationships between variables (Flick, 2018). This approach is typically quantitative and uses methods such as experiments and longitudinal studies to test hypotheses. For example, an explanatory design might analyse the impact of government policies on e-health implementation rates. It is deductive and structured, providing conclusive insights that can inform decision-making (Bryman, 2016). Consequently, by selecting an appropriate research design, researchers can ensure their study effectively addresses the research objectives and provides meaningful contributions to knowledge.

3.4.4 Adopted Research Design

Exploratory research helped to uncover critical drivers and barriers, paving the way for more focused quantitative or qualitative studies on e-health adoption. Additionally, this research design is well-suited for gaining insights into e-health systems in mobile network operations.

3.5 Research Strategy

A research strategy refers to the overarching plan or approach used to conduct a study, ensuring systematic and efficient data collection, analysis and interpretation to address the research objectives (Saunders et al., 2019). It provides a structured framework that guides the researcher in choosing appropriate methods and tools for the study. According to Creswell (2021) research strategies are categorised based on their purpose, design and the type of data collected. Common research strategies include experiments, surveys, case studies, ethnography, grounded theory and action research.

Experimental research involves manipulating variables to observe their effects on other variables, often used in natural sciences (Saunders et al., 2019). Surveys are widely used in social sciences to collect quantitative data from a large sample population through

questionnaires or interviews (Creswell, 2021). Case studies focus on an in-depth examination of a specific organisation, event, or individual to provide detailed insights into a phenomenon. Ethnography explores cultural phenomena by immersing the researcher in the participants' environment (Bryman, 2020). Grounded theory aims to develop theories based on data collected and analysed systematically during the research process. Lastly, action research involves solving practical problems through iterative cycles of planning, action, observation, and reflection (Saunders et al., 2019). Selecting the right research strategy depends on the research objectives, questions, and the nature of the study.

Consequently, the present study adopted a case study research approach to investigate factors influencing Mobile Network Operators in e-health systems at Mobile Telecom Communications Limited (MTC) Namibia. The case study research strategy was appropriate for this study as it enabled an in-depth exploration of the factors influencing mobile network operators in e-health systems within the specific context of Mobile Telecommunications Limited (MTC) Namibia. This strategy facilitated a comprehensive understanding of complex phenomena by examining real-life practices, challenges and dynamics unique to MTC (Yin, 2018). By focusing on a single organisation, the case study enabled the researcher to collect rich qualitative data through multiple sources such as interviews and questionnaires. This approach was also suitable for exploring emerging fields like e-health, where contextual factors play a critical role. Moreover, the case study method provided insights into practical solutions and best practices that can inform similar initiatives in the industry. Overall, it aligned well with the study's objective of providing a detailed analysis of MTC's involvement in e-health systems.

3.6 Population of the Study

The people or groups to whom the study relates are referred to as the target population (Masenya, 2018). These people or groups have certain characteristics and have the information the researcher needs (Zikmund & Babin, 2013). The population for this study comprised all 800 employees at MTC's Windhoek Head office. Since the study population is huge, it was practically impossible to study everyone within the organisation. Furthermore, not every employee was conversant with e-health within MTC hence those departments and individuals dealing with the issue under investigation were purposefully selected to participate in this study. Creswell & Creswell (2018) noted purposive sampling is a non-probability technique involving the selection of participants likely to provide valuable insights into e-health solutions. This method was chosen for its effectiveness in qualitative research,

focusing on deep understanding rather than generalization (Patton, 2002). The sample included senior executives, managers, and key personnel involved in e-health strategy, in line with Creswell and Poth's (2017) recommendation to select participants with direct experience in the topic.

3.7 Sampling and Sample Size

Sampling is the process of selecting a subset of individuals, objects, or events from a larger population to make inferences about the entire population (Creswell & Creswell, 2018). It is a critical component of research methodology that allows researchers to study a manageable portion of the population while ensuring the results are representative. Effective sampling techniques enhance the reliability and validity of the findings (Saunders et al., 2019).

3.7.1 Probability Sampling

Probability sampling involves selecting participants in such a way that each member of the population has a known, non-zero chance of being included (Bryman, 2016). Common techniques include simple random sampling, stratified sampling, and cluster sampling. For instance, simple random sampling ensures every individual in the population has an equal chance of selection, reducing selection bias. This approach is ideal for quantitative studies aiming for generalisable results (Creswell & Creswell, 2018).

3.7.1.1 Random Sampling

Random sampling, also known as simple random sampling, is a technique where every individual in the population has an equal chance of being selected (Creswell, 2021). This method ensures fairness and reduces selection bias, making it one of the most reliable sampling techniques. Researchers use tools such as random number generators or lottery methods to select participants (Saunders et al., 2019). According to Creswell (2021) this technique is ideal when studying large populations where each member's inclusion is crucial for representativeness. Random sampling enhances the generalisability of research findings by ensuring that the sample accurately represents the population (Bryman, 2020).

3.7.1.2 Systematic Sampling

Systematic sampling involves selecting every n th member of the population from a list or sampling frame after choosing a random starting point (Creswell, 2021). For instance, if the population size is 1,000 and the required sample is 100, every 10th person can be selected.

This method is easier to implement than random sampling and ensures a spread across the population (Saunders et al., 2019). However, it may introduce bias if there is an underlying pattern in the population list, making randomness less effective. Systematic sampling is often used in large-scale studies where efficiency is a priority (Bryman, 2020).

3.7.1.3 Stratified Sampling

Stratified sampling involves dividing the population into distinct subgroups or strata based on specific characteristics, such as age or income, and then randomly selecting participants from each stratum (Creswell, 2021). This technique ensures that the sample reflects the diversity of the population and allows for comparisons between subgroups (Saunders et al., 2019). Stratified sampling is particularly useful when certain subgroups are underrepresented in the population (Bryman, 2020).

3.7.1.4 Cluster Sampling

Cluster sampling divides the population into clusters, usually based on geographic or organisational boundaries, and then randomly selects entire clusters for study (Creswell, 2021). Within the selected clusters, researchers may include all members or use another sampling technique to choose participants (Saunders et al., 2019). This method is cost-effective and practical for large or dispersed populations, such as national surveys. However, it may increase sampling error compared to other probability techniques if clusters are not homogenous (Bryman, 2020). Cluster sampling is ideal for studies requiring broad coverage with limited resources.

3.7.2 Non-Probability Sampling

Creswell and Creswell (2018) noted that non-probability sampling relies on non-random methods of participant selection, where not all members of the population have an equal chance of inclusion (Flick, 2018). Techniques include convenience sampling, purposive sampling, and snowball sampling. Purposive sampling, for example, is used to select participants with specific characteristics relevant to the study. This approach is suitable for qualitative research that focuses on depth rather than generalisability (Saunders et al., 2019). Some of the key sampling techniques used in non-probability sampling methods include:

3.7.2.1 Purposive Sampling

Purposive sampling, also called judgmental sampling, involves selecting participants based on the researcher's judgment and the study's objectives (Creswell, 2021). Researchers intentionally choose individuals who are most likely to provide relevant information due to their expertise or experience (Saunders et al., 2019). For example, in a study on e-health systems, IT professionals with implementation experience may be selected. This method is effective for exploring specific phenomena but may introduce bias due to subjective selection (Bryman, 2020). Purposive sampling is ideal when the focus is on depth rather than generalisation.

3.7.2.2 Convenience Sampling

Convenience sampling selects participants who are easily accessible to the researcher, such as students in a classroom or employees in an office (Creswell, 2021). It is widely used in exploratory research where time and resources are limited (Saunders et al., 2019). Although this method is cost-effective and straightforward, it often lacks representativeness and may lead to biased results (Bryman, 2020). For instance, using convenience sampling in a study on healthcare perceptions might skew findings toward a particular demographic.

3.7.2.3 Snowball Sampling

Snowball sampling is used to recruit participants through referrals from initial subjects, making it suitable for reaching hidden or hard-to-access populations (Creswell, 2021). Researchers often rely on existing participants to identify others who meet the study criteria (Saunders et al., 2019). This method is commonly applied in social research, such as studies involving marginalized groups. While it can expand the sample effectively, it may result in bias as participants are often from similar networks (Bryman, 2020).

3.7.2.4 Quota Sampling

Quota sampling involves dividing the population into subgroups based on specific characteristics and selecting participants to meet predetermined quotas for each subgroup (Creswell, 2021). Unlike stratified sampling, participants are chosen non-randomly within each group (Saunders et al., 2019). For example, in a study requiring equal gender representation, researchers ensure half the sample is male and half female. While this method ensures subgroup representation, it may not capture broader population diversity (Bryman, 2020).

3.7.3 Adopted Sampling and Sample Size

The researcher chose non-probability sampling technique which is purposive quota sampling strategy to recruit members of specific segments to constitute the sample from the population. Participants were chosen because they possessed specific traits, knowledge, or experience relevant to the study hence the purposive sampling strategy was used because the selected respondents deal with leadership and e-health at MTC. Additionally, the researcher selected 15 participants drawn from senior executives, managers and key personnel involved in e-health strategy as alluded above. This means the participants were selected purposefully to capture key perspectives. This size was expected to achieve data saturation, where no new themes emerged from interviews (Glaser & Strauss, 1967), spanning various levels of the organisation involved in strategic, tactical and operational aspects of e-health. In this study, after 15 participants, the researcher saw that the responses that were coming in were repetitive, hence there were of little value. There were no new themes that were coming after the 15th interview. The sample size was justified because it provided a balance between depth and manageability, allowing for an in-depth exploration of the factors affecting e-health while maintaining the feasibility of the research.

3.8 Data Collection Instruments

Data collection instruments are tools used to gather, measure, and analyse data for research purposes (Creswell & Creswell, 2018). These instruments are essential for ensuring the consistency, reliability, and validity of the data being collected.

3.8.1 Surveys and Questionnaires

Surveys and questionnaires are widely used data collection instruments, particularly in quantitative research (Bryman, 2016). They involve a set of structured questions aimed at gathering information from a large sample. The responses can be analysed using statistical techniques to identify patterns and trends. Surveys are often administered online or through face-to-face interviews, making them versatile for different types of research (Creswell & Creswell, 2018).

3.8.2 Interviews

Interviews are a common qualitative data collection instrument that involves direct interaction between the researcher and the participant (Flick, 2018). They can be structured, semi-structured, or unstructured, depending on the research goals. Structured interviews

follow a set script, while semi-structured and unstructured interviews allow for more flexibility in exploring participants' responses. Interviews provide in-depth insights into participants' perspectives and experiences, making them ideal for exploratory studies (Saunders et al., 2019).

3.8.3 Observations

Observation is another approach to data collection, where the researcher records the behaviour of participants in their natural environment (Bryman, 2016). This instrument is often used in qualitative research to understand how individuals behave in specific settings. It can be participant or non-participant, depending on the level of involvement the researcher has with the group. Observation provides rich, contextual data but can be time-consuming and subject to researcher bias (Flick, 2018).

3.8.4 Adopted Data Collection Instruments

Data were collected using semi-structured interviews for qualitative data and questionnaires for quantitative data. The semi-structured interviews provided insights into the experiences, challenges, and strategies of MTC personnel in implementing e-health solutions. The surveys collected quantitative data on infrastructure, network coverage, and usage statistics. The combination of these two data collection methods ensured a comprehensive coverage of both subjective and objective aspects of e-health implementation. The research instruments aligned with the research objectives to ensure that each objective is thoroughly addressed.

3.9 Data Analysis

Chapman (2018) defines data analysis as the process of examining, classifying, modifying, and adjusting data to extract meaningful underlying information. Sharma and Jaiswal (2018), on the other hand, define data analysis as the deliberate use of logic or statistical processes to characterise, show, condense, summarise, and assess information. Data were analysed using thematic analysis for qualitative data, facilitated using ATLAS.ti software. Thematic analysis is well-suited for identifying, analysing, and reporting patterns (themes) within the interview data. Each theme was linked to the research objectives, ensuring that the findings address the core questions of the study (Braun & Clarke, 2006). By using ATLAS.ti, the study leveraged advanced qualitative data analysis features, such as coding, network visualization, and thematic mapping, allowing for a structured and comprehensive analysis of participant responses.

Consequently, qualitative data, were coded according to the key themes emerging from the data, aligned with the study's objectives. ATLAS.ti helped to manage and organize the large amounts of textual data, facilitating a deeper exploration of connections and relationships between themes. Moreover, objective 1, ATLAS.ti helped to identify the types of e-health initiatives currently undertaken by MTC by mapping out relevant themes and patterns in participant discussions. For Objective 2, the software assisted in highlighting perceived barriers and drivers to e-health implementation, allowing for a clear understanding of stakeholder experiences. Lastly, objective 3, ATLAS.ti helped to analyse suggested interventions by visualizing the relationships between different suggestions and linking them to specific challenges or opportunities identified during the interviews. This software was particularly effective for qualitative research as it allowed researchers to systematically categorise and analyse qualitative data, ensuring that no important insights were missed.

3.10 Data Quality Control

According to Saunders et al. (2018), instrument validity refers to the appropriateness of the measures employed to assess the accuracy of the outcome analysis and the generalisability of findings in each study. Creswell (2019) provided support for this, explaining that the validity of the instrument is utilised in research to determine whether the stated objectives to be measured have been met. Therefore, by posing field questions that yielded responses to the research questions, the researcher in this study guaranteed the validity of the instrument.

According to Baker (2019), reliability refers to how consistently and steadily the research technique provides results. Saunders et al. (2018) supported this by explaining that for the research instrument to be considered reliable, its application on the same object to be measured should produce several times of similar results. Therefore, reliability is the consistency of the measures used in a particular study. As a result, the researcher gave all the participants the same information, which was tested under comparable circumstances, in order to ensure the validity and reliability of the research instrument. Furthermore, the researcher ensured reliability of the research instruments by framing the questionnaire, questions and statements in such a way that they were not influenced by the concentration and mood of participants (Creswell. 2020). To ensure the validity of the data collection methods, the researcher additionally used two testing methodologies. This was

accomplished by piloting the research instrument on five randomly picked participants with the same characteristics are the final sample. The piloted participants did not form the final study sample; the instrument was found to be fairly accurate requiring fewer adjustments (Denzin & Lincoln, 2020).

Data quality control refers to the steps taken by researchers to ensure that the data are of high quality (Bryman., 2010), Another definition of data quality is the ability of the data to accomplish its intended purpose. It addresses the veracity of the information. High-quality data is defined as comprehensive, distinct, valid, timely, and consistent. To ensure acceptable quality data, the researcher ensured that data needs were accurately collected, which is a critical component of high-quality data (Saunders et al. (2019). It strives to meet standards and deliver data to clients and users for the purposes for which it was designed. The data needs should include the data's current condition, as well as all data contexts and scenarios.

3.11 Pilot Study

A pilot study was conducted to assess the feasibility of the research tool on factors influencing mobile network operators in e-health systems at Mobile Telecommunications Limited (MTC) Namibia. Three participants were selected for the study, chosen based on their expertise and involvement in implementing or managing e-health systems. These three individuals were not part of the main target population of 15 respondents. Their primary role was to review the questionnaire and identify any issues, such as spelling mistakes, the use of inappropriate or unclear language and other potential flaws. Their feedback was crucial for improving the research tool's clarity and ensuring that it aligns with the research objectives. By addressing these mistakes early, the researcher aimed to enhance the reliability and validity of the data collection process for the main study.

3.12 Trustworthiness

According to Saunders et al. (2019) trustworthiness in research relates to the quality, credibility, and dependability of a study's conclusions. Establishing credibility guarantees that research findings are truthful, valid, and ethical, making them useful to the intended audience. Creswell and Creswell (2022) noted that it is especially crucial in qualitative

research, where the subjective nature of data gathering and processing raises questions regarding bias and validity.

3.12.1 Credibility

Creswell (2013) asserted that credibility refers to the confidence in the truth of the research findings. To enhance credibility and trustworthiness, this study employed several established strategies such as triangulation and member checking. Triangulation refers to using multiple data sources, methods, or investigators to corroborate findings. As suggested by Denzin (2019), it was used to validate the findings by integrating data from semi-structured interviews and document analysis. Member checking, as recommended by Lincoln and Guba (2021), involved participants reviewing their interview transcripts to ensure accuracy.

3.12.2 Transferability

Saunders et al. (2019) noted that transferability is the extent to which findings can be applied to other contexts. The researcher ensured this by defining the study's parameters to improve comprehension of its generalisability. The researcher also provided thick descriptions, that is, comprehensive explanations of the research's background, participants, and procedures. Transferability, often equated with external validity in quantitative research, involves providing sufficient contextual details to enable judgments about the applicability of findings to other contexts (Shenton, 2021; Creswell, 2022). This study employed standard qualitative data collection methods to ensure the findings were comparable and transferable to past research conducted in similar environments (Nieuwenhuis, 2020).

3.12.3 Confirmability

Confirmability is the extent to which participant bias, rather than researcher bias, shapes the results. Saunders et al. (2019) noted that techniques to enhance confirmability that the researcher used included reflexivity which is the process by which researchers critically assess their own prejudices and how they affect their work. The researcher also kept a record of all choices and explanations in an audit trail. Confirmability ensures research findings are grounded in participants' ideas and experiences rather than the researcher's

biases (Denzin and Lincoln, 2019). This study ensured conformability through triangulation and by acknowledging the researcher's assumptions and beliefs to minimise bias.

3.12.4 Dependability

According to Saunders et al. (2019) dependability is the consistency and reliability of the research process. The researcher made use of an audit trail preserving detailed documentation of the choices and procedures made during study. He also carried out an external peer review to assess the methodology's rigour. Dependability refers to the consistency and repeatability of research findings (Lincoln and Guba., 2023). It is closely linked to credibility, as ensuring credibility enhances dependability (Silverman, 2020). The present study ensured dependability by accurately transferring data from collection instruments to findings and conducting repeated checks to prevent errors or omissions.

These approaches established a robust foundation for credibility and trustworthiness, ensuring that the findings were reliable and meaningful in the context of MTC's e-health initiatives.

3.13 Ethical Considerations

During the data collection process, several ethical considerations were central to this study, focusing on integrity and respect for participants. Informed consent was prioritised, ensuring participants were fully aware of the study's purpose, procedures, risks, and benefits before agreeing to participate. They were informed of their right to withdraw at any time without consequences, in line with Beauchamp and Childress's (2013) principles of respect for autonomy. In this study, the basics of ethics relating to informed consent, deception, privacy confidentiality, and accuracy were respected.

This research process did not in any way harm (unintended or otherwise) the research participants. According to Saunders et al. (2018) the research should protect the respondents from physical and any form of psychological harm. Consequently, the researcher ensured that respondents were not exposed to any form of harm or danger that could lead to victimisation. Therefore, before the trial, participants were made aware that their participation was optional. Instead, they would gain from it.

According to Saunders et al. (2019), the researcher must provide the participants with an explanation of the study's objectives and its intended audience. Before the study began, participants were told of its objective to ensure compliance with the principle of informed consent. Additionally, the researcher explained to the respondents that they may choose not to participate and withdraw from the study and that they have the right not to answer some of the questions should they feel uncomfortable (Creswell., 2020). In addition, the researcher made sure that the responders were aware of the study's implications before they participated.

The researcher used security measures to make sure that participant data, including views, attitudes, opinions, and records, was not revealed to outside parties without the participant's knowledge or consent. Creswell (2017) explained that ethical considerations revolve around the right to privacy which involves issues of plagiarism, honesty in reporting, and treating respondents with the dignity they deserve. Thus, the researcher obtained a letter of written ethical clearance from MTC's Head of Human Resources Department. In addition, before delivering the questionnaire to the participants, the researcher requested approval from the head of the human resources department.

The researcher treated the participants' private information with the utmost respect to preserve their anonymity and carry out this study. According to Saunders et al. (2018) confidentiality refers to upholding private information that has been gathered during the research process. Hence, the researcher upheld the principle of confidentiality through the provision of assurance to the participants that their names would not be disclosed in any part of the research process thus treating them with anonymity.

3.14 Chapter Summary

The Chapter described the methodology that was used in carrying out this research. It explained the research paradigm, research approach, research design, population, sample and sampling procedures, research instruments, and data gathering procedures, data analysis, validity/trustworthiness and ethical consideration. The next Chapter will discuss data analysis, presentation and discussion of findings.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

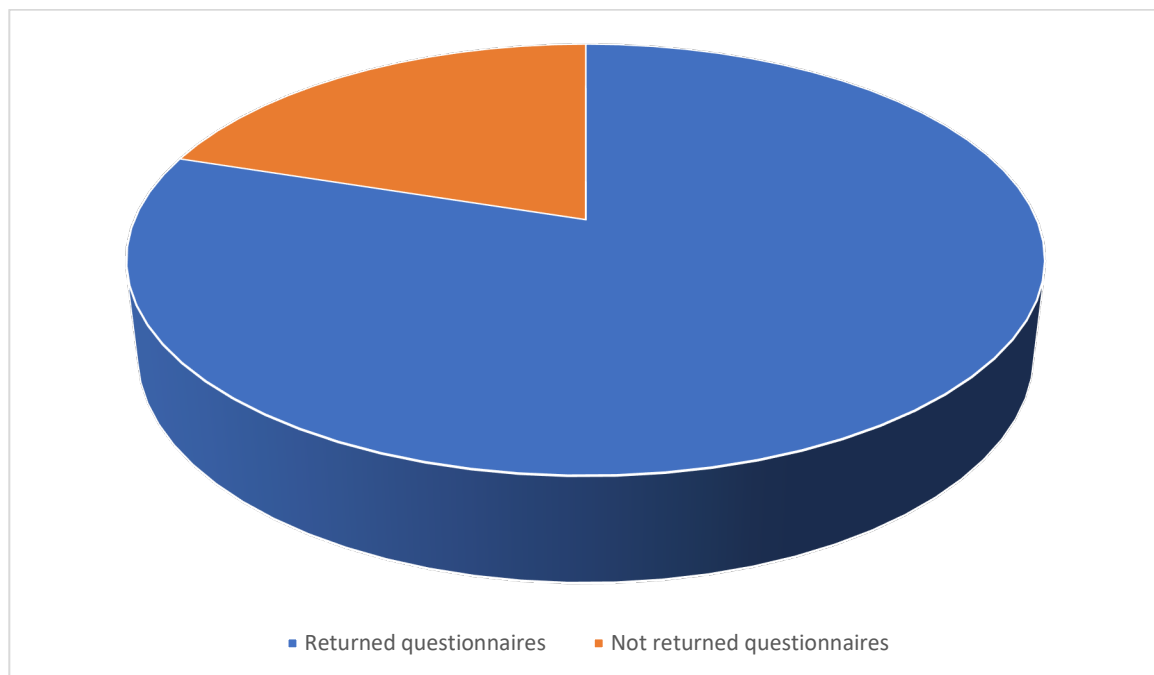
4.1 Introduction

This Chapter presents the findings of the study, analyses the data collected and interprets the results in alignment with the research objectives and questions. The study employed a qualitative research approach which enabled an in-depth exploration of the perspectives, experiences and insights of participants. The data were gathered through open-ended questionnaires, providing a rich, descriptive account of the phenomena under investigation.

4.2 Response Rate

Figure 4.1 Response Rate

Figure 4.1 below shows the response rate from the questionnaires that were distributed to 15 participants



Source: Field Survey

The above diagram shows the response rate of 80% (12 out of 15 questionnaires completed and returned) which is generally considered strong in qualitative research. It demonstrates

a high level of participant engagement, which enhances the credibility of the findings. According to Mugenda and Mugenda (2017), a study with a minimum response rate of 70% is sufficient for analysis and drawing conclusions. The response rate is in line with their assertion.

4.3 Gender of the Respondents

The results show the gender distribution of respondents, with 58% males and 42% females, which suggests a relatively balanced level of participation, though there is a slight male predominance. The participation of both genders, though not equal, provides a relatively balanced perspective. This diversity enhances the richness of the qualitative data by incorporating insights from both male and female respondents.

4.4 Age Group of the Respondents

Table 4.1 Age Group of the Respondents

Table 4.1 below shows the age group of the respondents

Age group of the respondents	Number of respondents	Percentage (%)
Below 25 years	1	8
26 to 35 years	3	25
36 to 45 years	5	42
46 to 55 years	2	17
56years and above	1	8
Total	12	100

Source: Field Survey 2025

The results indicate that the age distribution of respondents reflected a diverse range of participants across various age groups, with the majority falling in the 36–45-years range (42%). The largest group of respondents (42%) is aged 36–45, followed by 25% aged 25–35. This indicates that the study primarily reflects the perspectives of individuals in their prime working or professional years. This age group may contribute valuable insights due to their likely active participation in relevant activities related to the research topic. Individuals below 25 years (8%) and those aged 56 and above (8%) are underrepresented. This could suggest that younger and older participants may have limited engagement or relevance to the subject of the study, or it may reflect sampling challenges. The inclusion

of participants aged 46–55 (17%) adds diversity to the dataset, capturing perspectives from a range of age groups, which enriches the findings.

4.5 Duration Worked at MTC

The findings revealed that 25% of respondents had less than 5 years of work experience, 17% had 6–10 years, 50% had 11–15 years, and 8% had over 16 years. Most participants (50%) fell within the 11–15-year range, indicating that the study largely reflects the perspectives of mid-career professionals with significant experience in their field. The inclusion of individuals with less than 5 years (25%) and 6–10 years (17%) ensures representation of early-career professionals, adding diverse viewpoints to the analysis. However, the limited representation of highly experienced individuals (8% with over 16 years) may slightly constrain insights from seasoned experts. The distribution suggests that the study draws predominantly on individuals with practical, hands-on knowledge while incorporating varied levels of expertise. This range of experience levels enhances the study's depth but may require caution when generalising findings to broader populations. This was supported by Patton (2015) who asserts that longer durations in practice can lead to deeper experiential learning. Duration allows professionals to encounter a wide range of scenarios, reflect on them, and integrate lessons learned into their practice.

4.6 Position Held in the Organisation

The findings show that the majority (58%) of respondents were lower-level managers, followed by general management supervisors (33%), while only a small proportion (8%) were executive managers. This distribution suggests that the perspectives captured in the study are primarily from middle and lower-tier management rather than top executives. The limited representation of executive managers may impact the strategic insights gained, as decision-making at higher levels may not be fully reflected. According to Mintzberg (1990), managerial roles vary across hierarchical levels, with executive managers focusing on strategic planning, while lower-level managers deal with operational execution. The dominance of responses from lower-level managers and supervisors suggests that the study findings may be more reflective of operational challenges rather than strategic management issues.

4.7 The Department Worked by the Respondent

The results indicate a diverse representation of respondents from various departments within MTC, with the highest proportion (25%) from the Corporate Affairs office. This

suggests that Corporate Affairs plays a crucial role in MTC's e-health initiatives, potentially due to its involvement in stakeholder engagement, regulatory compliance, and public communication. The significant representation from the Office of the Financial Director (17%) highlights the financial considerations associated with e-health implementation, as budgetary allocations and investment decisions are essential for the success of such initiatives (Deloitte, 2020).

Additionally, the equal distribution (8%) of respondents from the Office of the Managing Director, Legal and Compliance and Risk Office, Technology Office, Human Capital, and Commercial Office underscores the multidisciplinary nature of eHealth projects. This balance implies that successful e-health implementation requires input from leadership, legal and compliance experts, technology specialists, and human resource professionals to ensure operational efficiency and regulatory adherence (World Health Organization [WHO], 2021). However, the lower representation from certain departments, such as the Technology Office, raises concerns about whether technical expertise is sufficiently integrated into the decision-making process for e-health initiatives. Given that technology is at the core of e-health solutions, limited involvement from this department could hinder effective implementation and long-term sustainability (Wang et al., 2020). Overall, these findings suggest that while MTC has engaged multiple departments in its e-health efforts, a more balanced and strategic involvement of all key stakeholders, particularly those in technology and compliance, is necessary for the successful adoption and expansion of e-health services in Namibia (HIMSS, 2022).

4.8 The Status of e-Health Service and Market Position for MTC Namibia

Research objective one focused on exploring the current eHealth initiatives implemented by MTC in Namibia. The sub-themes centred on the e-health initiatives MTC has put in place and how they are currently being utilised in Namibia.

4.8.1 The e-Health Services Offered by MTC

Participants indicated that MTC Namibia is actively providing e-health services, such as telemedicine, mobile health applications, and digital consultations. A respondent 1 mentioned, *"E-Health services are improving access to healthcare, especially in remote areas where medical facilities are scarce."* However, 2 participant 2 noted that *"Despite*

efforts, MTC's market position in e-health is still evolving, and competition from established healthcare providers remains a challenge."

Research supports that telemedicine can significantly improve healthcare access in remote areas (Kruse et al., 2018). However, Porter and Lee (2013) argue that while telecom companies can facilitate e-health services, long-term success requires strong partnerships with healthcare institutions to ensure quality service delivery. Telemedicine and mobile health applications have been widely recognized for bridging the gap in healthcare delivery (Kruse et al., 2018). However, the concern raised about MTC's evolving market position highlights the challenges associated with competition from traditional healthcare providers. According to Porter and Lee (2013), the success of e-health services requires strong integration with existing healthcare infrastructure and strategic partnerships. The presence of well-established healthcare institutions with advanced e-health capabilities may hinder MTC's growth. Furthermore, sustainability in this market depends on continuous technological investment and consumer trust (Luo et al., 2021). Addressing these concerns by strengthening hospital partnerships and ensuring service reliability can help MTC establish a stronger foothold. Additionally, regulatory support and improved digital literacy can facilitate broader adoption of e-health services (Mukherjee et al., 2022). Therefore, MTC should focus on differentiation through innovation and affordability to enhance its market competitiveness.

4.8.2 What is Your Current Market Position in the e-Health Market in Namibia?

Participants highlighted that MTC offers a range of e-health services, including telemedicine, mobile health applications, and remote patient monitoring. However, there was a consensus that the company is still in the early stages of fully leveraging its potential in the e-health market.

Participant 3: "Telemedicine and mobile applications are not yet a market leader. There is still a lot of room for growth."

Participant 7: "The current market position is moderate. The company is recognized, but needs to do more to compete with global players."

While MTC has made strides in offering e-health services, the company is not yet a dominant player in the Namibian market. Participants acknowledged the need for further innovation and expansion to strengthen their market position (Creswell & Poth, 2018). The findings

suggest that while MTC has made strides in introducing e-health services such as telemedicine, mobile health applications, and remote patient monitoring, its market position remains underdeveloped. This aligns with existing literature, which emphasises that telecommunications companies in emerging markets often struggle with infrastructure limitations, regulatory compliance, and user adoption when entering the e-health sector (WHO, 2021). According to Värttö et al. (2020), successful implementation of e-health services requires a strong digital infrastructure, collaboration with healthcare providers, and government support, all of which may still be in progress for MTC.

Furthermore, Zhao et al. (2019) highlight that telemedicine adoption is often hindered by concerns regarding data security, interoperability challenges, and resistance from healthcare professionals unfamiliar with digital health solutions. Similarly, Greenhalgh et al. (2017) suggest that mobile health applications face barriers related to user engagement, trust, and digital literacy, particularly in underserved communities. For MTC to fully capitalize on its e-health potential, it must address these challenges through targeted investments, enhanced stakeholder collaboration, and public awareness campaigns.

Additionally, Deloitte (2020) reports that leading telecommunications firms globally have successfully expanded their e-health footprints by integrating artificial intelligence, cloud computing, and blockchain to enhance service efficiency and security. MTC could consider similar approaches to strengthen its position in the market. Despite these challenges, there is a growing demand for digital health solutions, and with the right strategies, MTC can position itself as a key player in Namibia's evolving e-health landscape.

4.8.4 Departmental Role in Delivering e-Health Services

Participants from various departments within MTC highlighted their roles in delivering e-health services in Namibia. The responses indicated that departments such as the Technology Office, Legal and Compliance, and Corporate Affairs play critical roles in ensuring the successful implementation and delivery of e-health services.

Participant 2 (Technology Office): "My role is to develop and maintain the technological infrastructure that supports e-health services. I ensure that the systems are reliable and can handle real-time data transmission."

Participant 6 (Legal and Compliance): "My role is to focus on ensuring that all e-health services comply with local and international regulations, particularly around data privacy and security."

Participant 9 (Corporate Affairs): "My department is responsible for building partnerships with healthcare providers and promoting e-health services to the public. I also handle stakeholder engagement and communication."

The findings reveal that the delivery of e-health services in Namibia is a collaborative effort across multiple departments within MTC. The technology office plays a pivotal role in developing and maintaining the technical infrastructure necessary for e-health services, ensuring reliability and real-time data transmission (World Health Organization, 2020). The Legal and Compliance Department ensures that all services adhere to regulatory requirements, particularly in areas such as data privacy and security, which are critical for building patient trust (Patton, 2015). Meanwhile, the Corporate Affairs Department focuses on stakeholder engagement, partnership building, and public awareness, which are essential for the successful adoption of e-health services (Creswell & Poth, 2018). This multi-departmental approach highlights the importance of cross-functional collaboration in delivering effective e-health solutions. However, challenges such as resource constraints and regulatory complexities can hinder the seamless delivery of these services. To overcome these barriers, MTC must continue to invest in technology, ensure compliance with evolving regulations, and foster strong partnerships with healthcare providers. The findings align with global trends that emphasise the need for integrated efforts in delivering digital health solutions (World Health Organization, 2020).

4.8.5 Confidence in MTC's Ability to Support Real-Time eHealth Applications

Participants expressed varying levels of confidence in MTC's ability to reliably support e-health applications that require real-time data transmission. While some participants were optimistic about the company's technological capabilities, others highlighted concerns related to infrastructure limitations and potential technical challenges.

Participant 3 (Technology Office): "I have made significant investments in our network infrastructure, and I am confident that I can support real-time data transmission for e-health applications."

Participant 7 (General Management): "While I have the technical capability, there are still areas where I need to improve, especially in rural areas where network coverage can be inconsistent."

Participant 10 (Legal and Compliance): "From a regulatory standpoint, the department is compliant, but the real challenge is ensuring uninterrupted service, especially during peak usage times."

The findings indicate that while MTC has made progress in developing the infrastructure needed to support real-time e-health applications, there are still challenges that need to be addressed. Participants from the Technology Office expressed confidence in the company's ability to handle real-time data transmission, citing significant investments in network infrastructure (World Health Organization, 2020). However, concerns were raised about inconsistent network coverage in rural areas, which could hinder the reliability of e-health services in those regions (Patton, 2015). This highlights the need for continued investment in expanding and upgrading network infrastructure to ensure equitable access to e-health services across Namibia. Additionally, the Legal and Compliance Department emphasised the importance of maintaining regulatory compliance while ensuring uninterrupted service, particularly during peak usage times (Creswell & Poth, 2018). These findings align with global trends that emphasise the need for robust and reliable infrastructure to support digital health solutions, especially in low-resource settings (World Health Organization, 2020).

4.8.6 Concerns About Data Privacy and Security in MTC eHealth Services

The respondents acknowledged that data privacy and security are significant concerns for users of MTC's e-health services. While some participants reported that these concerns have been raised by patients and healthcare providers, others emphasized that MTC has implemented measures to address these issues.

Participant 4 (Legal and Compliance): "I have received concerns from patients about how their data is stored and shared. They want assurance that their information is secure."

Participant 8 (Technology Office): "I have implemented encryption and other security measures to protect patient data, but there is always room for improvement."

Participant 11 (Corporate Affairs): "Educating users about data privacy policies has helped alleviate some concerns, but I still need to build more trust."

The findings reveal that data privacy and security are critical concerns for users of MTC's e-health services, reflecting a broader global trend in digital health where patient trust is paramount (World Health Organization, 2020). Participants from the Legal and Compliance Department noted that patients have expressed concerns about how their data is stored and

shared, highlighting the need for transparency and robust security measures (Patton, 2015). The Technology Office reported that encryption and other security protocols have been implemented to safeguard patient data but acknowledged that continuous improvement is necessary to address evolving threats (Creswell & Poth, 2018). The Corporate Affairs Department emphasised the importance of user education in building trust, suggesting that clear communication about data privacy policies can help alleviate concerns. However, the findings also indicate that more work is needed to fully address these issues, particularly in a context where regulatory requirements and user expectations are constantly evolving. This aligns with global best practices that stress the importance of data security and privacy in the successful adoption of eHealth services (World Health Organization, 2020).

4.9. Investigate the Drivers and Barriers Towards Effective e-Health Implementation by MTC in Namibia.

The second research objective focused on investigating the drivers and barriers to the effective implementation of e-health initiatives by MTC in Namibia. Key sub-themes included the way(s) is MTC actively collaborating with healthcare providers to develop e-health solutions, how important is it for MTC to partner with healthcare providers to offer comprehensive e-health services, the internal drivers or factors pushing MTC towards offering better e-health services in Namibia and the external drivers or factors pushing MTC towards offering better e-health services in Namibia.

4.9.1 Collaboration with Healthcare Providers for e-Health Solutions

Participants emphasised that MTC is actively collaborating with healthcare providers to develop and implement e-health solutions. These collaborations include joint initiatives, technology integration, and co-development of services tailored to the needs of patients and healthcare professionals.

Participant 2 (Technology Office): "I am working closely with hospitals and clinics to integrate our e-health platforms with their systems. This ensures seamless data flow and better patient care."

Participant 5 (Corporate Affairs): "I have partnered with several healthcare providers to co-develop mobile health apps that address specific medical needs, such as remote monitoring and teleconsultations."

Participant 9 (General Management): "My collaborations extend to training healthcare staff on how to use e-health tools effectively, ensuring that the technology is adopted and utilized properly."

The results reveal that MTC's collaboration with healthcare providers is a key driver in the development of e-health solutions, aligning with global trends that emphasize the importance of partnerships in digital health innovation (World Health Organization, 2020). Participants from the Technology Office highlighted the integration of e-health platforms with hospital systems, which facilitates seamless data exchange and enhances patient care (Bates et al., 2014). The Corporate Affairs Department emphasised co-development initiatives, such as mobile health apps, which are tailored to address specific medical needs like remote monitoring and teleconsultations. This approach ensures that e-health solutions are relevant and effective in real-world healthcare settings (Topol, 2019). Additionally, the General Management team noted the importance of training healthcare staff to use e-health tools, which is critical for ensuring the successful adoption and utilisation of these technologies (Greenhalgh et al., 2017). These collaborative efforts reflect a holistic approach to e-health development, where technology, healthcare expertise, and user training are integrated to create sustainable solutions. However, challenges such as differing priorities between MTC and healthcare providers, as well as resource constraints, may hinder the pace of collaboration (Cresswell & Sheikh, 2013).

4.9.2 Importance of Partnering with Healthcare Providers for Comprehensive eHealth Services

Participants unanimously emphasised the critical importance of partnering with healthcare providers to offer comprehensive e-health services. They highlighted that such collaborations are essential for ensuring that e-health solutions are clinically relevant, user-friendly, and aligned with the needs of patients and healthcare professionals.

Participant 3 (Technology Office): "Partnering with healthcare providers is crucial because they bring the clinical expertise needed to design e-health solutions that actually work in real-world settings."

Participant 6 (Corporate Affairs): "Without partnerships, I risk developing solutions that do not meet the needs of patients or healthcare providers. Collaboration ensures that the company's services are practical and effective."

Participant 10 (General Management): "Healthcare providers are the end-users of many of our e-health tools. Their input is invaluable for ensuring adoption and scalability."

The findings underscore the importance of partnerships between MTC and healthcare providers in delivering comprehensive e-health services, a sentiment echoed in global digital health literature (World Health Organization, 2020). Participants from the Technology Office emphasised that healthcare providers bring essential clinical expertise, ensuring that e-health solutions are both effective and practical (Bates et al., 2014). The Corporate Affairs Department highlighted the risk of developing solutions that fail to meet user needs without such collaborations, aligning with studies that stress the importance of user-centred design in digital health (Greenhalgh et al., 2017). The General Management team noted that healthcare providers are key end-users, and their input is critical for ensuring the adoption and scalability of e-health tools (Topol, 2019). These partnerships also help bridge the gap between technology and healthcare, fostering innovation that is both clinically relevant and technologically advanced (Blumenthal, 2010). However, challenges such as aligning priorities, managing resource allocation, and ensuring effective communication between partners can hinder collaboration (Cresswell & Sheikh, 2013). Despite these challenges, the consensus among participants is that partnerships with healthcare providers are indispensable for the success of e-health initiatives. This aligns with global best practices that advocate for multi-stakeholder collaboration in digital health to improve healthcare access, quality, and outcomes (World Health Organization, 2020).

4.9.3 Internal Drivers for Enhancing e-Health Services at MTC Namibia

Participants identified several internal drivers pushing MTC towards improving its e-health services. A senior executive stated, *"MTC's commitment to digital transformation is a key motivator for expanding our e-health services."* Another participant emphasized, *"I am leveraging strong telecommunications infrastructure to support real-time health data transmission and remote consultations."* Additionally, innovation, corporate social responsibility, and a strategic focus on healthcare market expansion were cited as crucial internal factors.

Digital transformation is a significant driver for telecom companies entering the e-health sector (Deloitte, 2021). Companies with advanced ICT infrastructure can leverage existing resources to provide innovative healthcare solutions (Wilson et al., 2019). Additionally, corporate social responsibility initiatives have been linked to increased investment in digital

health solutions (Porter & Kramer, 2011). However, while internal capabilities play a crucial role, scholars argue that success in e-health requires alignment with healthcare regulations and user adoption strategies (Greenhalgh et al., 2017). To sustain a competitive advantage, MTC must continue investing in technological upgrades and stakeholder collaboration (Mukherjee et al., 2022).

4.9.4 External Drivers for Improving e-Health Services

Participants identified several external drivers pushing MTC to offer better e-health services in Namibia. These include increasing demand for digital health solutions, government policies promoting e-health, and competition from global and local players.

Participant 2 (Technology Office): "The demand for digital health solutions is growing rapidly, especially after the COVID-19 pandemic. I want access to healthcare services from their homes."

Participant 5 (Corporate Affairs): "Government policies are encouraging the adoption of e-health services. I need to align with these policies to stay relevant and compliant."

Participant 9 (General Management): "Competition is a major driver. Global and local players are entering the e-health market, and I need to innovate to stay ahead."

The findings reveal that external drivers such as increasing demand for digital health, government policies, and competition are significant factors pushing MTC to enhance its e-health services. Participants from the Technology Office highlighted the growing demand for digital health solutions, particularly in the wake of the COVID-19 pandemic, which has accelerated the adoption of telemedicine and remote healthcare services (World Health Organization, 2020). The Corporate Affairs Department emphasised the role of government policies in promoting e-health, aligning with global trends where governments are increasingly investing in digital health infrastructure to improve healthcare access and efficiency (Blumenthal, 2010). The General Management team pointed to competition as a key driver, noting that both global and local players are entering the e-health market, creating pressure to innovate and differentiate (Topol, 2019). These external drivers are consistent with findings from studies that highlight the importance of market demand, regulatory support, and competitive dynamics in shaping digital health strategies (Bates et al., 2014). However, participants also acknowledged that navigating these external pressures requires significant investment and strategic planning, particularly in a rapidly evolving market (Cresswell & Sheikh, 2013).

4.9.5 Challenges in Delivering e-Health Services at MTC

Participants identified several challenges that hinder the delivery of effective e-health services in Namibia. These challenges include limited infrastructure, data privacy concerns, and resistance to change among healthcare providers and patients.

Participant 3 (Technology Office): "One of the biggest challenges is the lack of reliable infrastructure, especially in rural areas. Without proper internet connectivity, e-health services cannot function effectively."

Participant 6 (Legal and Compliance): "Data privacy and security are major concerns. Patients are worried about how their data is stored and shared, and we need to ensure compliance with regulations."

Participant 10 (Corporate Affairs): "There is resistance to change among some healthcare providers and patients. They are used to traditional methods and are hesitant to adopt new technologies."

The findings highlight significant challenges in delivering e-health services, including infrastructure limitations, data privacy concerns, and resistance to change. Participants from the Technology Office pointed out the lack of reliable infrastructure, particularly in rural areas, which is a common barrier in low-resource settings (World Health Organization, 2020). The Legal and Compliance Department emphasised data privacy and security as critical issues, reflecting global concerns about the protection of patient data in digital health systems (Blumenthal, 2010). The Corporate Affairs Department noted resistance to change among healthcare providers and patients, a challenge that is well-documented in studies on the adoption of health technologies (Greenhalgh et al., 2017). These challenges are consistent with findings from other regions, where infrastructure gaps, regulatory complexities, and cultural resistance have hindered the implementation of e-health solutions (Cresswell & Sheikh, 2013). Addressing these challenges requires a multi-faceted approach, including investment in infrastructure, robust data protection measures, and targeted training and awareness programs to encourage the adoption of e-health technologies (Topol, 2019). Despite these obstacles, the potential benefits of e-health in improving healthcare access and quality make it imperative to overcome these challenges (Bates et al., 2014).

4.9.6 External Challenges Inhibiting e-Health Service Delivery at MTC

Participants from various departments identified several external challenges that hinder MTC's ability to offer better e-health services in Namibia. These challenges include regulatory hurdles, limited healthcare infrastructure, and competition from global players.

Participant 4 (Technology Office): "Regulatory challenges are a major barrier. The process of getting approvals for new e-health solutions can be slow and cumbersome, delaying implementation."

Participant 7 (Corporate Affairs): "The lack of adequate healthcare infrastructure in some regions makes it difficult to deliver e-health services effectively. I need better facilities and resources to support these services."

Participant 11 (General Management): "Competition from global players is intense. I often have more resources and advanced technologies, making it challenging for us to compete."

The findings reveal that external challenges such as regulatory hurdles, inadequate healthcare infrastructure, and competition from global players are significant barriers to MTC's e-health service delivery. Participants from the Technology Office highlighted regulatory challenges, which are a common issue in the digital health sector, often slowing down the deployment of innovative solutions (World Health Organization, 2020). The Corporate Affairs Department pointed out the lack of adequate healthcare infrastructure, particularly in rural areas, which is a critical barrier to the effective delivery of e-health services (Blumenthal, 2010). The General Management team highlighted the intense competition from global players, who often have more resources and advanced technologies, creating pressure on local providers to innovate and differentiate (Topol, 2019). These challenges are consistent with the findings from other regions, where regulatory complexities, infrastructure gaps, and competitive dynamics have hindered the growth of e-health services (Cresswell & Sheikh, 2013). Addressing these external barriers requires a multi-faceted approach, including advocacy for regulatory reforms, investment in healthcare infrastructure, and strategic partnerships to enhance technological capabilities (Greenhalgh et al., 2017). Despite these challenges, the potential benefits of e-health in improving healthcare access and quality make it imperative to overcome these barriers (Bates et al., 2014).

4.10 Strategies for Competitive Advantage in the e-Health Market in Namibia

The third research objective focused on developing strategic interventions that MTC could adopt to enhance e-health services in Namibia. Key sub-themes included whether MTC can play a significant role in improving healthcare access and quality through e-health services, strategies either at the departmental level or organisational level to be put in place to achieve competitive advantage in the e-health market in Namibia as well as to discover how prepared MTC is in withstanding competition from global Mobile Network Operators offering e-health.

4.10.1 MTC's Potential Role in Improving Healthcare Access and Quality through eHealth Services

Participants from various departments expressed optimism about MTC's potential to significantly improve healthcare access and quality through eHealth services. They highlighted the company's technological expertise, infrastructure, and partnerships as key enablers.

Participant 2 (Technology Office): "MTC has the technological capability to revolutionize healthcare delivery in Namibia. The e-health platforms can bridge the gap between urban and rural healthcare access."

Participant 5 (Corporate Affairs): "Through partnerships with healthcare providers, I can offer services like telemedicine and remote monitoring, which can significantly improve healthcare quality."

Participant 9 (General Management): "I have the infrastructure and the vision to make a real impact. With the right strategies, MTC can become a leader in e-health in Namibia."

The findings indicate a strong belief among participants that MTC can play a significant role in improving healthcare access and quality through e-health services. Participants from the Technology Office emphasized MTC's technological capabilities, which can help bridge the gap between urban and rural healthcare access, a critical issue in low-resource settings (World Health Organization, 2020). The Corporate Affairs Department highlighted the importance of partnerships with healthcare providers, which are essential for delivering effective e-health solutions like telemedicine and remote monitoring (Blumenthal, 2010). The General Management team pointed to MTC's infrastructure and strategic vision as key enablers for making a meaningful impact in the e-health sector (Topol, 2019). These perspectives align with global trends that emphasise the role of telecommunications companies in driving digital health innovation, particularly in regions with limited healthcare

infrastructure (Bates et al., 2014). However, participants also acknowledged that realising this potential requires addressing challenges such as regulatory hurdles, data privacy concerns, and resistance to change (Cresswell & Sheikh, 2013). Despite these challenges, the consensus is that MTC is well-positioned to leverage its technological expertise and partnerships to improve healthcare access and quality, ultimately contributing to better health outcomes in Namibia (Greenhalgh et al., 2017).

4.10.2 Strategies for Achieving Competitive Advantage in the e-Health Market

Participants from various departments outlined several strategies that MTC has implemented at both departmental and organisational levels to achieve a competitive advantage in the e-health market in Namibia. These strategies include technological innovation, strategic partnerships, and customer-centric approaches.

Participant 3 (Technology Office): "MTC is investing heavily in cutting-edge technologies like AI and IoT to enhance our e-health platforms. This allows the company to offer more advanced and reliable services."

Participant 6 (Corporate Affairs): "Forming strategic partnerships with healthcare providers and tech companies is key. These collaborations help us co-develop solutions that meet specific healthcare needs."

Participant 10 (General Management): "I focus on a customer-centric approach, ensuring that our e-health services are user-friendly and meet the actual needs of patients and healthcare providers."

The results reveal that MTC is employing a multi-faceted strategy to achieve a competitive advantage in the e-health market. Participants from the Technology Office highlighted investments in advanced technologies like AI and IoT, which are critical for developing innovative and reliable e-health solutions (Topol, 2019). The Corporate Affairs Department emphasised the importance of strategic partnerships with healthcare providers and tech companies, which enable MTC to co-develop tailored solutions that address specific healthcare challenges (Blumenthal, 2010). The General Management team pointed to a customer-centric approach, ensuring that e-health services are user-friendly and meet the actual needs of patients and healthcare providers, a strategy that aligns with global best practices in digital health (Greenhalgh et al., 2017). These strategies are consistent with findings from other regions, where technological innovation, strategic partnerships, and customer focus have been key drivers of success in the e-health market (Bates et al., 2014).

However, participants also acknowledged that implementing these strategies requires significant investment and coordination across departments, as well as ongoing efforts to address challenges such as regulatory compliance and data privacy (Cresswell & Sheikh, 2013).

4.10.3 MTC's Preparedness to Compete with Global Mobile Network Operators in e-Health

Participants from various departments shared their perspectives on MTC's preparedness to compete with global Mobile Network Operators (MNOs) offering e-health services. While some expressed confidence in MTC's local expertise and infrastructure, others highlighted areas where the company needs to improve to remain competitive.

Participant 4 (Technology Office): "We have a strong local presence and understand the unique needs of the Namibian market. This gives MTC an edge over global players who may not have the same level of insight."

Participant 7 (Corporate Affairs): "Global MNOs have more resources and advanced technologies, but the company is focusing on building strong local partnerships and tailoring our services to meet local needs."

Participant 11 (General Management): "The company needs to invest more in innovation and marketing to compete effectively. Global players are aggressive, and the company must be proactive to maintain our market position."

The findings reveal mixed perspectives on MTC's preparedness to compete with global MNOs in the e-health market. Participants from the Technology Office emphasized MTC's strong local presence and deep understanding of the Namibian market, which are critical advantages in tailoring e-health solutions to local needs (World Health Organization, 2020). The Corporate Affairs Department acknowledged the resource and technological advantages of global MNOs but highlighted MTC's focus on building strong local partnerships and customizing services, a strategy that aligns with global best practices in digital health (Blumenthal, 2010). However, the General Management team pointed out the need for increased investment in innovation and marketing to compete effectively with global players, who often have more aggressive market strategies (Topol, 2019). These findings are consistent with studies that emphasize the importance of local expertise and partnerships in competing with global players in the e-health sector (Bates et al., 2014). However, participants also acknowledged that MTC must address challenges such as

limited resources and the need for continuous technological upgrades to remain competitive (Cresswell & Sheikh, 2013).

4.10.4 Enhancing e-Health Offerings to Better Meet Customer Needs

Participants from various departments suggested several ways MTC could enhance its e-health offerings to better meet customer needs. These include improving user experience, expanding service offerings, and ensuring robust data security.

Participant 2 (Technology Office): "There is a need to focus on making our e-health platforms more user-friendly. Simplifying the user interface and ensuring seamless navigation can significantly enhance customer satisfaction."

Participant 5 (Corporate Affairs): "Expanding our service offerings to include more specialized care, such as mental health support and chronic disease management, would better meet the diverse needs of our customers."

Participant 9 (General Management): "Data security is a top concern for our customers. Enhancing our security measures and being transparent about how we handle data will build trust and encourage more people to use our services."

The results suggest that MTC can enhance its e-health offerings by focusing on user experience, expanding service offerings, and ensuring robust data security. Participants from the Technology Office emphasized the importance of user-friendly interfaces, which are critical for ensuring that eHealth platforms are accessible and easy to use, particularly for non-tech-savvy users (World Health Organization, 2020). The Corporate Affairs Department highlighted the need to expand service offerings to include specialised care, such as mental health support and chronic disease management, which are increasingly in demand (Blumenthal, 2010). The General Management team pointed out that data security is a top concern for customers, and enhancing security measures while being transparent about data handling can build trust and encourage adoption (Topol, 2019). These suggestions align with global best practices that emphasise the importance of user-centered design, comprehensive service offerings, and robust data security in digital health (Bates et al., 2014). However, participants also acknowledged that implementing these enhancements requires significant investment and coordination across departments, as well as ongoing efforts to address regulatory and technical challenges (Cresswell & Sheikh, 2013). Overall, the findings underscore the importance of a holistic approach to enhancing

e-health offerings, combining technological innovation, customer focus, and strong data security measures to better meet customer needs (Greenhalgh et al., 2017).

4.11 Chapter Summary

This Chapter provided an in-depth interpretation and analysis of the findings related to MTC's e-health initiatives, focusing on challenges, strategic interventions, and sustainability measures. Key themes included technical barriers, cultural factors, and data privacy issues, highlighting the need for targeted strategies to address these challenges. The findings emphasised the importance of training and capacity-building programs, fostering collaborations with healthcare providers, leveraging emerging technologies, and ensuring the long-term sustainability of e-health services. Stakeholder feedback revealed the necessity for culturally sensitive, user-centric solutions tailored to Namibia's unique context. Additionally, financial constraints and infrastructure gaps were identified as critical barriers to effective implementation. Strategic recommendations are centered on increasing stakeholder engagement, adopting innovative technologies, and prioritizing underserved communities. Overall, the Chapter underscored the potential of MTC's eHealth initiatives to revolutionise healthcare delivery in Namibia if these challenges are effectively addressed.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusions and recommendations derived from the study on the strategic factors influencing the role of Mobile Network Operators (MNOs) in the implementation of e-health systems, using Mobile Telecommunications Limited (MTC) Namibia as the case study. It synthesises key insights from the analysis in line with the study's objectives and thematic areas. The chapter aims to offer actionable, strategy-driven recommendations to strengthen MTC's e-health initiatives by addressing existing barriers and unlocking opportunities for enhanced impact and sustainability.

5.2 Summary

The research objectives of the study were to explore the current e-health initiatives, to investigate the drivers and barriers towards effective e-health implementation and to develop strategic interventions that MTC could adopt to enhance e-health services in Namibia.

The study is divided into five Chapters. Chapter One served as a general introduction to the research topic, and it covers among other topics background of the study and statement of the problem. Chapter Two provided a comprehensive literature review that aligns with the study's research objectives. Chapter Three outlined the methodology, detailing the research design, population, sampling methods, and procedures. It also discusses the research instruments, data collection methods, and techniques for data analysis. Chapter Four dealt with the analysis of data that was collected during the data collection period and the discussion of those findings. Lastly, Chapter Five presented the study's summary, conclusions, and recommendations.

5.3 Conclusions

Chapter 5 concludes by summarizing the key findings and insights gathered from the interviews with participants across various departments at MTC. It highlights the importance of collaboration with healthcare providers, the need for continuous innovation, and the challenges posed by both internal and external factors.

5.1 The Status of e-Health Service and Market Position for MTC Namibia

Research objective one focused on exploring the current e-health initiatives implemented by MTC in Namibia. The sub-themes centred on the e-health initiatives MTC has put in place and how they are currently being utilised in Namibia.

Research supports that telemedicine can significantly improve healthcare access in remote areas (Kruse et al., 2018). However, Porter and Lee (2013) argue that while telecom companies can facilitate e-health services, long-term success requires strong partnerships with healthcare institutions to ensure quality service delivery. Telemedicine and mobile health applications have been widely recognised for bridging the gap in healthcare delivery (Kruse et al., 2018). However, the concern raised about MTC's evolving market position highlights the challenges associated with competition from traditional healthcare providers. According to Porter and Lee (2013), the success of e-health services requires strong integration with existing healthcare infrastructure and strategic partnerships. The presence of well-established healthcare institutions with advanced e-health capabilities may hinder MTC's growth. Furthermore, sustainability in this market depends on continuous technological investment and consumer trust (Luo et al., 2021). Addressing these concerns by strengthening hospital partnerships and ensuring service reliability can help MTC establish a stronger foothold. Additionally, regulatory support and improved digital literacy can facilitate broader adoption of e-health services (Mukherjee et al., 2022). Therefore, MTC should focus on differentiation through innovation and affordability to enhance its market competitiveness.

Participants highlighted that MTC offers a range of e-health services, including telemedicine, mobile health applications, and remote patient monitoring. However, there was a consensus that the company is still in the early stages of fully leveraging its potential in the e-health market. While MTC has made strides in offering e-health services, the company is not yet a dominant player in the Namibian market. Participants acknowledged the need for further innovation and expansion to strengthen their market position (Creswell & Poth, 2018). The findings suggest that while MTC has made strides in introducing e-health services such as telemedicine, mobile health applications, and remote patient monitoring, its market position remains underdeveloped. This aligns with existing literature, which emphasises that telecommunications companies in emerging markets often struggle with infrastructure limitations, regulatory compliance, and user adoption when entering the e-health sector (WHO, 2021). According to Värttö et al. (2020), successful implementation of e-health

services requires a strong digital infrastructure, collaboration with healthcare providers, and government support, all of which may still be in progress for MTC.

Furthermore, research by Zhao et al. (2019) highlights that telemedicine adoption is often hindered by concerns regarding data security, interoperability challenges, and resistance from healthcare professionals unfamiliar with digital health solutions. Similarly, Greenhalgh et al. (2017) suggest that mobile health applications face barriers related to user engagement, trust, and digital literacy, particularly in underserved communities. For MTC to fully capitalize on its e-health potential, it must address these challenges through targeted investments, enhanced stakeholder collaboration, and public awareness campaigns.

Additionally, Deloitte (2020) reports that leading telecommunications firms globally have successfully expanded their e-health footprint by integrating artificial intelligence, cloud computing, and blockchain to enhance service efficiency and security. MTC could consider similar approaches to strengthen its position in the market. Despite these challenges, there is a growing demand for digital health solutions, and with the right strategies, MTC can position itself as a key player in Namibia's evolving e-health landscape.

Participants from various departments within MTC highlighted their roles in delivering e-health services in Namibia. The responses indicated that departments such as the Technology Office, Legal and Compliance, and Corporate Affairs play critical roles in ensuring the successful implementation and delivery of e-health services. The findings reveal that the delivery of e-health services in Namibia is a collaborative effort across multiple departments within MTC. The Technology Office plays a pivotal role in developing and maintaining the technical infrastructure necessary for e-health services, ensuring reliability and real-time data transmission (World Health Organization, 2020). The Legal and Compliance department ensures that all services adhere to regulatory requirements, particularly in areas such as data privacy and security, which are critical for building patient trust (Patton, 2015). Meanwhile, the Corporate Affairs Department focuses on stakeholder engagement, partnership building, and public awareness, which are essential for the successful adoption of e-health services (Creswell & Poth, 2018). This multi-departmental approach highlights the importance of cross-functional collaboration in delivering effective e-health solutions. However, challenges such as resource constraints and regulatory complexities can hinder the seamless delivery of these services. To overcome these barriers, MTC must continue to invest in technology, ensure compliance with evolving regulations, and foster strong partnerships with healthcare providers. The findings align with

global trends that emphasise the need for integrated efforts in delivering digital health solutions (World Health Organization, 2020).

The respondents expressed varying levels of confidence in MTC's ability to reliably support e-health applications that require real-time data transmission. While some participants were optimistic about the company's technological capabilities, others highlighted concerns related to infrastructure limitations and potential technical challenges. The findings indicate that while MTC has made progress in developing the infrastructure needed to support real-time e-health applications, there are still challenges that need to be addressed. Concerns were raised about inconsistent network coverage in rural areas, which could hinder the reliability of e-health services in those regions (Patton, 2015). This highlights the need for continued investment in expanding and upgrading network infrastructure to ensure equitable access to e-health services across Namibia. The Legal and Compliance Department emphasised the importance of maintaining regulatory compliance while ensuring uninterrupted service, particularly during peak usage times (Creswell & Poth, 2018). These findings align with global trends that emphasise the need for robust and reliable infrastructure to support digital health solutions, especially in low-resource settings (World Health Organization, 2020).

The findings reveal that data privacy and security are critical concerns for users of MTC's e-health services, reflecting a broader global trend in digital health where patient trust is paramount (World Health Organization, 2020). While some participants reported that these concerns have been raised by patients and healthcare providers, others emphasized that MTC has implemented measures to address these issues. Participants from the Legal and Compliance Department noted that patients have expressed concerns about how their data is stored and shared, highlighting the need for transparency and robust security measures (Patton, 2015). The Technology Office reported that encryption and other security protocols have been implemented to safeguard patient data but acknowledged that continuous improvement is necessary to address evolving threats (Creswell & Poth, 2018). The Corporate Affairs Department emphasised the importance of user education in building trust, suggesting that clear communication about data privacy policies can help alleviate concerns. However, the findings also indicate that more work is needed to fully address these issues, particularly in the context where regulatory requirements and user expectations are constantly evolving. This aligns with global best practices that stress the importance of data

security and privacy in the successful adoption of e-health services (World Health Organization, 2020).

5.2 Investigate the Drivers and Barriers to Effective e-Health Implementation by MTC in Namibia

The second research objective focused on investigating the drivers and barriers to the effective implementation of e-health initiatives by MTC in Namibia. Key sub-themes included the way(s) in which MTC is actively collaborating with healthcare providers to develop e-health solutions, how important it is for MTC to partner with healthcare providers to offer comprehensive e-health services, the internal drivers or factors pushing MTC towards offering better e-health services in Namibia and the external drivers or factors pushing MTC towards offering better e-health services in Namibia.

Participants emphasised that MTC is actively collaborating with healthcare providers to develop and implement e-health solutions. These collaborations include joint initiatives, technology integration, and co-development of services tailored to the needs of patients and healthcare professionals. The results reveal that MTC's collaboration with healthcare providers is a key driver in the development of e-health solutions, aligning with global trends that emphasise the importance of partnerships in digital health innovation (World Health Organization, 2020). Participants from the Technology Office highlighted the integration of eHealth platforms with hospital systems, which facilitates seamless data exchange and enhances patient care (Bates et al., 2014). The Corporate Affairs Department emphasised co-development initiatives, such as mobile health apps, which are tailored to address specific medical needs like remote monitoring and teleconsultations. This approach ensures that e-health solutions are relevant and effective in real-world healthcare settings (Topol, 2019).

Additionally, the General Management team noted the importance of training healthcare staff to use e-health tools, which is critical for ensuring the successful adoption and utilisation of these technologies (Greenhalgh et al., 2017). These collaborative efforts reflect a holistic approach to e-health development, where technology, healthcare expertise, and user training are integrated to create sustainable solutions. However, challenges such as differing priorities between MTC and healthcare providers, as well as resource constraints, may hinder the pace of collaboration (Cresswell & Sheikh, 2013).

The Corporate Affairs Department highlighted the risk of developing solutions that fail to meet user needs without such collaborations, aligning with studies that stress the importance of user-centred design in digital health (Greenhalgh et al., 2017). The General Management team noted that healthcare providers are key end-users, and their input is critical for ensuring the adoption and scalability of e-health tools (Topol, 2019). These partnerships also help bridge the gap between technology and healthcare, fostering innovation that is both clinically relevant and technologically advanced (Blumenthal, 2010). However, challenges such as aligning priorities, managing resource allocation, and ensuring effective communication between partners can hinder collaboration (Cresswell & Sheikh, 2013). Despite these challenges, the consensus among participants is that partnerships with healthcare providers are indispensable for the success of e-health initiatives. This aligns with global best practices that advocate for multi-stakeholder collaboration in digital health to improve healthcare access, quality, and outcomes (World Health Organization, 2020).

Participants identified several internal drivers pushing MTC towards improving its e-health services. A senior executive stated, *"MTC's commitment to digital transformation is a key motivator for expanding our e-health services."* Another participant emphasized, *"I am leveraging strong telecommunications infrastructure to support real-time health data transmission and remote consultations."* Additionally, innovation, corporate social responsibility, and a strategic focus on healthcare market expansion were cited as crucial internal factors.

Digital transformation is a significant driver for telecom companies entering the e-health sector (Deloitte, 2021). Companies with advanced ICT infrastructure can leverage existing resources to provide innovative healthcare solutions (Wilson et al., 2019). Additionally, corporate social responsibility initiatives have been linked to increased investment in digital health solutions (Porter & Kramer, 2011). However, while internal capabilities play a crucial role, scholars argue that success in e-health requires alignment with healthcare regulations and user adoption strategies (Greenhalgh et al., 2017). To sustain a competitive advantage, MTC must continue investing in technological upgrades and stakeholder collaboration (Mukherjee et al., 2022).

Participants identified several external drivers pushing MTC to offer better e-health services in Namibia. These include increasing demand for digital health solutions, government policies promoting e-health, and competition from global and local players. The findings reveal that external drivers such as increasing demand for digital health, government

policies, and competition are significant factors pushing MTC to enhance its e-health services. Participants from the Technology Office highlighted the growing demand for digital health solutions, particularly in the wake of the COVID-19 pandemic, which has accelerated the adoption of telemedicine and remote healthcare services (World Health Organization, 2020). The Corporate Affairs department emphasized the role of government policies in promoting e-health, aligning with global trends where governments are increasingly investing in digital health infrastructure to improve healthcare access and efficiency (Blumenthal, 2010). The General Management team pointed to competition as a key driver, noting that both global and local players are entering the e-health market, creating pressure to innovate and differentiate (Topol, 2019). These external drivers are consistent with findings from studies that highlight the importance of market demand, regulatory support, and competitive dynamics in shaping digital health strategies (Bates et al., 2014). However, participants also acknowledged that navigating these external pressures requires significant investment and strategic planning, particularly in a rapidly evolving market (Cresswell & Sheikh, 2013).

Participants identified several challenges that hinder the delivery of effective e-health services in Namibia. These challenges include limited infrastructure, data privacy concerns, and resistance to change among healthcare providers and patients. The findings highlight significant challenges in delivering e-health services, including infrastructure limitations, data privacy concerns, and resistance to change. Participants from the Technology Office pointed out the lack of reliable infrastructure, particularly in rural areas, which is a common barrier in low-resource settings (World Health Organization, 2020). The Legal and Compliance Department emphasised data privacy and security as critical issues, reflecting global concerns about the protection of patient data in digital health systems (Blumenthal, 2010). The Corporate Affairs Department noted resistance to change among healthcare providers and patients, a challenge that is well-documented in studies on the adoption of health technologies (Greenhalgh et al., 2017). These challenges are consistent with findings from other regions, where infrastructure gaps, regulatory complexities, and cultural resistance have hindered the implementation of e-health solutions (Cresswell & Sheikh, 2013). Addressing these challenges requires a multi-faceted approach, including investment in infrastructure, robust data protection measures, and targeted training and awareness programs to encourage the adoption of e-health technologies (Topol, 2019). Despite these obstacles, the potential benefits of e-health in improving healthcare access and quality make it imperative to overcome these challenges (Bates et al., 2014).

5.3 Strategies for Competitive Advantage in the e-Health Market in Namibia

The third research objective focused on developing strategic interventions that MTC could adopt to enhance e-health services in Namibia. Key sub-themes included whether MTC can play a significant role in improving healthcare access and quality through e-health services, strategies either at the departmental level or organisational level to be put in place to achieve competitive advantage in the e-health market in Namibia as well as to discover how prepared MTC is in withstanding competition from global Mobile Network Operators offering e-health.

Participants from various departments expressed optimism about MTC's potential to significantly improve healthcare access and quality through e-health services. They highlighted the company's technological expertise, infrastructure, and partnerships as key enablers. The findings indicate a strong belief among participants that MTC can play a significant role in improving healthcare access and quality through e-health services. Participants from the Technology Office emphasised MTC's technological capabilities, which can help bridge the gap between urban and rural healthcare access, a critical issue in low-resource settings (World Health Organization, 2020). The Corporate Affairs Department highlighted the importance of partnerships with healthcare providers, which are essential for delivering effective e-health solutions like telemedicine and remote monitoring (Blumenthal, 2010). The General Management team pointed to MTC's infrastructure and strategic vision as key enablers for making a meaningful impact in the e-health sector (Topol, 2019). These perspectives align with global trends that emphasise the role of telecommunications companies in driving digital health innovation, particularly in regions with limited healthcare infrastructure (Bates et al., 2014). However, participants also acknowledged that realising this potential requires addressing challenges such as regulatory hurdles, data privacy concerns, and resistance to change (Cresswell & Sheikh, 2013). Despite these challenges, the consensus is that MTC is well-positioned to leverage its technological expertise and partnerships to improve healthcare access and quality, ultimately contributing to better health outcomes in Namibia (Greenhalgh et al., 2017).

Participants from various departments outlined several strategies that MTC has implemented at both departmental and organisational levels to achieve a competitive advantage in the e-health market in Namibia. These strategies include technological innovation, strategic partnerships, and customer-centric approaches. The results reveal that MTC is employing a multi-faceted strategy to achieve a competitive advantage in the e-

health market. Participants from the Technology Office highlighted investments in advanced technologies like AI and IoT, which are critical for developing innovative and reliable e-health solutions (Topol, 2019). The Corporate Affairs Department emphasised the importance of strategic partnerships with healthcare providers and tech companies, which enable MTC to co-develop tailored solutions that address specific healthcare challenges (Blumenthal, 2010). The General Management team pointed to a customer-centric approach, ensuring that e-health services are user-friendly and meet the actual needs of patients and healthcare providers, a strategy that aligns with global best practices in digital health (Greenhalgh et al., 2017). These strategies are consistent with findings from other regions, where technological innovation, strategic partnerships, and customer focus have been key drivers of success in the e-health market (Bates et al., 2014). However, participants also acknowledged that implementing these strategies requires significant investment and coordination across departments, as well as ongoing efforts to address challenges such as regulatory compliance and data privacy (Cresswell & Sheikh, 2013).

Participants from various departments shared their perspectives on MTC's preparedness to compete with global Mobile Network Operators (MNOs) offering e-health services. While some expressed confidence in MTC's local expertise and infrastructure, others highlighted areas where the company needs to improve to remain competitive. The findings reveal mixed perspectives on MTC's preparedness to compete with global MNOs in the e-health market. Participants from the Technology Office emphasized MTC's strong local presence and deep understanding of the Namibian market, which are critical advantages in tailoring e-health solutions to local needs (World Health Organization, 2020). The Corporate Affairs Department acknowledged the resource and technological advantages of global MNOs but highlighted MTC's focus on building strong local partnerships and customising services, a strategy that aligns with global best practices in digital health (Blumenthal, 2010). However, the General Management team pointed out the need for increased investment in innovation and marketing to compete effectively with global players, who often have more aggressive market strategies (Topol, 2019). These findings are consistent with studies that emphasize the importance of local expertise and partnerships in competing with global players in the e-health sector (Bates et al., 2014). However, participants also acknowledged that MTC must address challenges such as limited resources and the need for continuous technological upgrades to remain competitive (Cresswell & Sheikh, 2013).

Participants from various departments suggested several ways MTC could enhance its e-health offerings to better meet customer needs. These include improving user experience, expanding service offerings, and ensuring robust data security. The results suggest that MTC can enhance its e-health offerings by focusing on user experience, expanding service offerings, and ensuring robust data security. Participants from the Technology Office emphasised the importance of user-friendly interfaces, which are critical for ensuring that e-health platforms are accessible and easy to use, particularly for non-tech-savvy users (World Health Organization, 2020). The Corporate Affairs Department highlighted the need to expand service offerings to include specialised care, such as mental health support and chronic disease management, which are increasingly in demand (Blumenthal, 2010). The General Management team pointed out that data security is a top concern for customers, and enhancing security measures while being transparent about data handling can build trust and encourage adoption (Topol, 2019). These suggestions align with global best practices that emphasize the importance of user-centred design, comprehensive service offerings, and robust data security in digital health (Bates et al., 2014). However, participants also acknowledged that implementing these enhancements requires significant investment and coordination across departments, as well as ongoing efforts to address regulatory and technical challenges (Cresswell & Sheikh, 2013). Overall, the findings underscore the importance of a holistic approach to enhancing e-health offerings, combining technological innovation, customer focus, and strong data security measures to better meet customer needs (Greenhalgh et al., 2017).

5.4 Recommendations

- MTC should prioritize investments in expanding and upgrading its network infrastructure, particularly in rural areas, to ensure reliable and widespread access to e-health services. This will help bridge the urban-rural healthcare gap. Given that MTC is doing well, financially, they can afford to do this (erecting boosters and setting up all the required infrastructure).
- Implement robust data protection measures and ensure compliance with local and international regulations. Transparent communication about data handling practices will build trust among users and encourage the adoption of e-health services. This is also viable and should be given preference.

- Continue to build and strengthen partnerships with healthcare providers, technology companies, and government agencies. Collaborative efforts can lead to the co-development of tailored e-health solutions that address specific healthcare needs.
- Simplify user interfaces and ensure that e-health platforms are user-friendly, particularly for non-tech-savvy users. Conduct regular user feedback sessions to continuously improve the usability and functionality of e-health services. This is an act that can be easily done.
- Diversify e-health services to include specialised care such as mental health support, chronic disease management, and maternal health services. This will better meet the diverse needs of the population and enhance the overall value of e-health offerings.
- Allocate resources for research and development to stay ahead of technological advancements. Investing in cutting-edge technologies like AI, IoT, and blockchain can enhance the capabilities and reliability of e-health platforms. This however calls for investment in strong IT personnel.
- Launch awareness campaigns to educate the public and healthcare providers about the benefits and usage of e-health services. Provide training programs for healthcare staff to ensure effective adoption and utilization of e-health tools. These can be easily arranged and are doable.
- Formulate a comprehensive strategy to compete with global Mobile Network Operators (MNOs). Focus on leveraging local market knowledge, building strong local partnerships, and differentiating services to maintain a competitive edge in the e-health market.

5.4 Recommendations for Further Studies

This study has explored factors influencing Mobile Network Operators (MNOs) in implementing e-health systems at Mobile Telecommunications Limited (MTC) Namibia. However, several areas warrant further investigation to deepen understanding and improve the implementation of eHealth initiatives: Future research could examine how other MNOs in Namibia and the region approach eHealth implementation. A comparative study would provide insights into best practices and innovative strategies that MTC could adopt. Further

studies could focus on evaluating the tangible impacts of e-health systems on healthcare outcomes in Namibia, such as patient satisfaction, accessibility, and efficiency in service delivery.

5.5 Chapter Summary

The study titled "Strategic Factors Influencing the Role of Mobile Network Operators in the Implementation of E-Health Systems: A Case Study of Mobile Telecommunications Limited, Namibia" was structured into five chapters. Chapter One introduced the study by outlining the background to the problem, the statement of the problem, the significance of the study, and its primary objective. Chapter Two presented a review of relevant literature, focusing on theoretical frameworks and key concepts related to the strategic role of mobile network operators in supporting e-health system implementation.

Chapter Three focused on the research methodology, detailing the procedures for data collection, the study's sample size, the sampling methods used, and the population under investigation. It also described the research instruments employed, addressed the reliability and validity of the study, and outlined measures to eliminate bias, along with ethical considerations.

Chapter Four presented the study's results, providing an in-depth discussion and interpretation of the findings.

Chapter Five concluded the research by summarizing key insights and offering practical recommendations for improving eHealth initiatives at MTC, while also highlighting areas for future research.

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APPENDIX 1

QUESTIONNAIRE FOR MOBILE TELECOMMUNICATION (MTC) EMPLOYEES INFORMED CONSENT FOR RESEARCH INTERVIEW

Research Title

STRATEGIC FACTORS INFLUENCING THE ROLE OF MOBILE NETWORK OPERATORS IN
THE IMPLEMENTATION OF E-HEALTH SYSTEMS: A CASE STUDY OF MOBILE
TELECOMMUNICATIONS LIMITED (MTC), NAMIBIA

By
Elton Katangolo

Introduction

I am conducting a research study on the strategic factors influencing the role of Mobile Network Operators in the implementation of E-Health Systems, with Mobile Telecommunications Limited (MTC) Namibia as the case study. This interview is expected to last approximately 45 to 60 minutes and aims to gain insights into the key strategic drivers, challenges, and opportunities that shape MTC's role in supporting e-health service delivery in Namibia.

Your participation in this research is completely voluntary. You are free to withdraw from the interview at any time without any penalty. By signing this letter, you acknowledge and provide consent for the following:

- **Recording:** The interview will be recorded for accuracy in data collection and analysis.
- **Transcription:** The recorded interview might be transcribed by a third-party transcriber. This individual will be bound by a standard non-disclosure agreement, ensuring your responses remain confidential.
- **Use of Quotations:** Verbatim quotations from this interview might be included in the research report. However, these quotations will not be associated with your name or that of MTC Namibia to maintain anonymity.
- **Public Report:** The data from this interview will contribute to a research report. This report will be made publicly available once the examination process at the Namibia University of Science and Technology.
- **Data Storage:** All collected data will be stored without identifiers to further ensure anonymity and confidentiality.

Should you have any concerns or require clarification about the research, feel free to contact either me or my research supervisor.

Our contact details are provided below for your convenience.

Researcher Name: Mr Elton Katangolo

Email: EKatangolo@mtc.com.na

Phone: +264 811002050

Research Supervisor Name: Prof. Nikodemus Angula

Email: nangula@nust.na

Interview Schedule

Interviewer	Interviewee
Name of Interviewer:	Gender of Interviewee:
Affiliation.....	Affiliation:
Interview date:	Interview date:
Interview Start Time:	Interview Start Time:
Interview End Time:	Interview End Time:
Location:	Location:
Signature:	Signature:

Section A: Participant Profile (Please Tick where appropriate)

1. Managerial Level

Lower level	General Management	Executive Management

2. Department

Office of the Managing Director	Office of the Financial Director	Legal and Compliance and Risk Office	Technology office	Human Capital	Corporate Affairs and Marketing	Commercial Office

3. Number of years at M.T.C.

1-2 years	2 years, 1 month – 4 years	4 years, 1 month – 6 years	6 years, 1 month-8 years	8 years, 1 month – 10 years	10 years+

Section B: Status of e-health service and market position for MTC Namibia

4. What are the e-Health services offered by MTC?

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5. What is your current market position in the e-Health market in Namibia?

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6. As a department, what is your role in delivering e-Health services in Namibia?

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7. How confident are you that MTC can reliably support eHealth applications requiring real-time data transmission?

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8. Have you received any concerns about data privacy and security by people or patients using MTC eHealth services?

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Section C: Collaboration, Drivers and Drivers to e-Health delivery in Namibia

9. In what way(s) is MTC actively collaborating with healthcare providers to develop eHealth solutions?

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10. How important is it for your MTC to partner with healthcare providers to offer comprehensive eHealth services?

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11. What are some of the internal drivers or factors pushing MTC towards offering better e-Health services in Namibia?

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12. What are some of the external drivers or factors pushing MTC towards offering better e-Health services in Namibia?

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13. What are some of the internal challenges or barriers inhibiting MTC in offering better e-Health services in Namibia?

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14. What are some of the external challenges or barriers inhibiting MTC in offering better e-Health services in Namibia?

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Section D: Strategies for competitive advantage in the e-Health market in Namibia

15. Do you believe that MTC can play a significant role in improving healthcare access and quality through eHealth services?

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16. What strategies either at Departmental level or organisational level have you put in place to achieve competitive advantage in the e-Health market in Namibia?

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17. How prepared is MTC in withstanding competition from global Mobile Network Operators offering e-Health?

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18. How could MTC further enhance their e-Health offerings to better meet customer needs?

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END OF INTERVIEW

THANK YOU FOR YOUR VALUABLE TIME

23 January 2024

To Whom It May Concern:

**PERMISSION TO CONDUCT RESEARCH AS PART OF THE REQUIREMENTS FOR
THE AWARD OF MASTERS QUALIFICATION**

The Master's qualification at Namibia University of Science and Technology (NUST) requires that all students undertake a practical research project. In this way, students are allowed to creatively link and discuss the theoretical aspects of the programme to the practical issues facing organisations in real-life settings. Typically, this project necessitates data gathering by questionnaires or interviews.

Elton CF Katangolo (200221272) has chosen to do a research project entitled: **Investigating factors influencing mobile network operators in E-health systems at Mobile Telecom Communications LTD, Namibia**

We appreciate your assistance in permitting access to your organisation for purposes of this research. Please be assured that all information gained from the research will be treated with the utmost circumspection. The student will adhere to principles of confidentiality and anonymity when reporting information about research participants.

I am available at any stage to answer any queries and/or discuss any aspect of this research project.

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Thank you for your assistance in this request.

Sincerely



Sulaiman Olusegun Atiku, Ph.D.
Professor of Research
Harold Pupkewitz Graduate School of Business
Namibia University of Science and Technology
13 Jackson Kaujeua Street
Private Bag: 13388
Windhoek, Namibia
Email: satiku@nust.na
<https://orcid.org/0000-0001-9364-3774>



Please kindly tick in the boxes or fill in appropriate responses in spaces provided

Section A: Demographic Information

1. What is your gender?

Male ☐

Female ☐

2. Age group (in years)

Below 25 ☐

25-35 ☐

36-45 ☐

46-55 ☐

56 and above ☐

3. How long have you been with the organisation?

Less than 5 years ☐

6 -10 years ☐

11-15 years ☐

Above 15 years ☐

4. What department do you specialise in?

Credit Control ☐

Human Resource ☐

Sales ☐

Technical ☐

5. What position do you hold in the organisation

Senior manager ☐

Department supervisor ☐

Non- managerial Staff ☐

6. Indicate your level of education (*please tick where appropriate*)

Grade 10 Level	
Grade 12 Level	
College Level	
University Degree level	

Section B: Research Objective 1: *Explore the current eHealth initiatives by MTC in Namibia.*

1. What eHealth initiatives has MTC implemented in Namibia, and how are they currently being used?

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2. How do these eHealth initiatives align with Namibia's healthcare needs and priorities?

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3. What specific technologies or platforms are being utilized in MTC's eHealth initiatives?

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4. Can you describe the role of MTC's partnerships (e.g., with healthcare providers, government, or NGOs) in implementing eHealth solutions?

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5. What feedback have healthcare providers and patients given regarding the effectiveness of MTC's eHealth initiatives?

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6. How does MTC measure the success or impact of its eHealth initiatives?

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Section C: Research Objective 2: *Investigate the drivers and barriers towards effective eHealth implementation by MTC in Namibia.*

1. What factors do you think are driving MTC's focus on eHealth in Namibia?

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2. How has the government's digital transformation agenda influenced MTC's eHealth initiatives?

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3. What technical challenges has MTC faced in implementing eHealth solutions?

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4. Are there any cultural or societal factors affecting the adoption of MTC's eHealth initiatives in Namibia?

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5. How does MTC address issues related to data privacy and security in its eHealth projects?

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6. What are the most significant barriers you believe hinder the successful implementation of eHealth initiatives by MTC?

Section D: Research Objective 3: *Develop strategic interventions that MTC could adopt to enhance eHealth services in Namibia.*

1. What improvements do you think MTC could make to its current eHealth initiatives?

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2. How could MTC better collaborate with healthcare providers to improve eHealth services?

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3. What strategies could MTC adopt to increase the adoption of eHealth technologies in underserved communities?

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4. How can MTC leverage emerging technologies (e.g., AI, IoT) to enhance eHealth services?

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5. What role could training and capacity-building programs play in improving MTC's eHealth implementation?

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6. In your opinion, how can MTC ensure long-term sustainability of its eHealth initiatives?

.....

.....

The End

Permission letter to collect data obtained from NUST



c/o Brahms and Haydn Streets
Private Bag 13388
Windhoek
NAMIBIA

T: +264 61 207 2809
F: +264 61 207 9809
E: hpgsb@nust.na
W: www.nust.na

24 January 2025

To Whom It May Concern:

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Email: satiku@nust.na
<https://orcid.org/0000-0001-9364-3774>



Permission letter to collect data obtained from MTC

January 2025

Mr. Elton CF Katangolo
Namibia University of Science and Technology

MTC Mobile Telecommunications Limited

Corner of Mosé Tjitendero &
Hamutenya Wanahepo Ndadi Streets,
PO Box 23051, Windhoek, Namibia

T +264 (0) 61 280 2000
F +264 (0) 61 280 2124

Dear Mr. Katangolo,

After thorough review and consideration of your request, we are pleased to inform you that Mobile Telecommunications Limited (MTC) Namibia grants permission and ethical clearance for your proposed research titled, *"Investigating Factors Influencing Mobile Network Operators in eHealth Systems at Mobile Telecommunications Limited (MTC) Namibia."*

Conditions of Approval:

- 1. Confidentiality:**
We commend your commitment to safeguarding the confidentiality of MTC Namibia's sensitive information. Please ensure that any information gathered during your research, including data from interviews and documents, is utilized solely for the purpose of your study. Confidential information unrelated to your research scope must remain protected.
- 2. Participant Rights and Consent:**
All participants must be fully informed about the purpose of the research, their rights to confidentiality, and their option to withdraw at any time without penalty. Consent must be obtained prior to participation.
- 3. Research Findings and Feedback:**
We request that you share the findings and outcomes of your research with MTC Namibia to understand how your research may contribute to MTC Namibia's strategic development.
- 4. Engagement Protocols:**
Kindly ensure that all interactions with MTC Namibia's employees or stakeholders are conducted professionally and respectfully, with minimal disruption to their daily activities.

Conclusion:

At MTC Namibia, we value the role academic research plays in advancing industry practices. We are confident that your research will offer valuable insights not only for your academic work but also to enhance MTC Namibia's capabilities in the eHealth domain.

Should you require further assistance or clarification at any stage of your research, please do not hesitate to contact me. We wish you great success in your academic and professional endeavors.

Yours Sincerely,



Mr. Octivius Kahiya
Chief Commercial Officer

Dr Theresia Mushaandja

BED Sec; BA Hons in English Studies; M.A. in English Studies; Editing and Proof
reading certificate (UCT), PHD in English Studies; Senior Lecturer, English (NUST)
JOTERSS English Language and Research Private Academy (Chief Editor)
P. O Box 487, Windhoek Tel: 0816408864 Email: joterss2014@gmail.com

27 March 2025

To: Whom it may concern

Re: Editor's report

This letter is an attestation that I, Dr Theresia Mushaandja, from the language and research academy, cited above, carried out the language editing of the research report by Mr **Elton C.F. Katangolo**. The research is titled **INVESTIGATING FACTORS INFLUENCING MOBILE NETWORK OPERATORS IN E-HEALTH SYSTEMS AT MOBILE TELECOM COMMUNICATIONS LIMITED (MTC) NAMIBIA**.

The following linguistic components and features were focused on concord, which is the agreement between subjects and verbs. Sentence construction: at times, one finds that some sentences may need rephrasing to make sense or may need to be shortened or completed for the same effect. Consistency in the use of words, tenses, and forms of language. Another area that I focused on is the use of punctuation, especially the omissions and or the overuse. I also suggested changes where words with the same meaning were used but did not express the idea fully in the context they were used.

As I edit, I set the computer English Language to UK and not to USA. I also made use of track changes, so that the student, and if need be, the supervisor, will be able to track the changes I suggested, to accept or decline them as may be found appropriate.

For additional questions and clarity, do not hesitate to contact me at 08164 088 64 or e-mail me at joterss2014@gmail.com

Sincerely yours,



T. Mushaandja (Language Editor)