

The impact of digital transformation in the South African ICT Telecoms industry

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ABSTRACT

This study aimed to explore how digital transformation impacts the South African ICT Telecoms industry while also determining the digital themes involved and the challenges that come with them to see if there is a potential for a competitive advantage. A quantitative survey research method was used to gather data from 123 ICT managers and senior employees of South African telecom companies. The outcome presents insights into the perceived significance of the different digital transformation themes; cloud computing and big data analytics are found to be strategically important. The digital skills gap, together with infrastructure limitations and regulatory challenges, is identified as a critical obstacle. In addition, the present study examines the perceived consequences of digital transformation initiatives on competitiveness in relation to efficiency, customer experience, and innovation.

The study contributes to the existing body of literature by providing empirical evidence of the specific challenges and opportunities in the South African ICT Telecoms context that can help policymakers, industry leaders, and ICT professionals navigate the process of digital transformation. The conceptual framework also depicts the digital transformation themes and the mediating factors leading to competitiveness within the South African ICT Telecoms landscape. Last, the survey questions were developed to capture the respondents' perceptions of the importance of these themes in informing digital transformation initiatives.

Keywords: Digital Transformation; ICT (Information and Communication Technology); Cloud Computing; Big Data Analytics; Artificial Intelligence (AI); Internet of Things (IoT); Digital Skills Gap; Organizational Culture.

DECLARATION

I, Nompumelelo Mnguni, declare that this research report is my own work except as indicated in the references and acknowledgments. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Signed at

On the day of 20....

ACKNOWLEDGMENTS

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LIST OF TABLES

TABLE 1: WORK EXPERIENCE	16
TABLE 2: GENDER IDENTIFICATION.....	17
TABLE 3: AGE GROUP	18
TABLE 4: EDUCATIONAL BACKGROUND	19
TABLE 5: RESEARCH SURVEY RESULTS	21

LIST OF FIGURES

FIGURE 1: CONCEPTUAL FRAMEWORK FOR DIGITAL TRANSFORMATION IN THE SOUTH AFRICAN ICT TELECOMS INDUSTRY	8
FIGURE 2: PERSONS EMPLOYED IN THE TELECOMMUNICATIONS SECTOR, AS OF THE 30TH OF SEPTEMBER EACH YEAR – ADAPTED FROM (ICASA: <i>THE STATE OF THE ICT SECTOR REPORT OF SOUTH AFRICA, 2024</i>)	11
FIGURE 3: PERSONS EMPLOYED IN THE TELECOMMUNICATIONS SECTOR BREAKDOWN FROM 2019 TO 2023 – ADAPTED FROM (ICASA: <i>THE STATE OF THE ICT SECTOR REPORT OF SOUTH AFRICA, 2024</i>)	11
FIGURE 4: WORK EXPERIENCE.....	17
FIGURE 5: GENDER IDENTIFICATION	18
FIGURE 6: AGE GROUP	19
FIGURE 7: EDUCATIONAL BACKGROUND	20

Table of Contents

ABSTRACT	I
DECLARATION	II
ACKNOWLEDGMENTS	III
LIST OF TABLES	IV
LIST OF FIGURES	V
CHAPTER 1. INTRODUCTION.....	1
1.1 PURPOSE OF THE STUDY	1
1.2 CONTEXT OF THE STUDY	1
1.3 RESEARCH PROBLEM	1
1.4 RESEARCH OBJECTIVES	2
1.5 RATIONALE	2
1.6 DELIMITATION OF THE STUDY.....	2
1.7 DEFINITION OF TERMS.....	3
1.8 ASSUMPTIONS.....	4
CHAPTER 2. LITERATURE REVIEW	5
2.1 INTRODUCTION	5
2.2 CORE DIGITAL TRANSFORMATION THEMES FOR THE SOUTH AFRICAN ICT TELECOMS INDUSTRY	5
2.3 OBSTACLES TO DIGITAL TRANSFORMATION IN THE SOUTH AFRICAN TELECOMS INDUSTRY.....	6
2.4 POTENTIAL IMPROVEMENTS IN COMPETITIVENESS THROUGH DIGITAL TRANSFORMATION IN THE SOUTH AFRICAN ICT TELECOMS INDUSTRY	6
2.5 CHAPTER SUMMARY, PROPOSITIONS, AND CONCEPTUAL FRAMEWORK	7
2.5.1 PROPOSITIONS	7
2.5.2 CONCEPTUAL FRAMEWORK.....	8
2.5.2.1 ALIGNMENT OF THE THEORY TO THE RESEARCH OBJECTIVES.....	8
CHAPTER 3. RESEARCH METHODOLOGY.....	10
3.1 RESEARCH APPROACH	10
3.2 RESEARCH DESIGN	10
3.3 POPULATION AND SAMPLE	10
3.3.1 POPULATION	10
3.3.2 SAMPLE AND SAMPLING METHOD	12
3.4 UNIT OF ANALYSIS.....	12
3.5 DATA COLLECTION METHODS	12
3.6 SURVEY INSTRUMENT	12
3.7 PROCEDURE FOR DATA COLLECTION.....	13

3.8	DATA ANALYSIS STRATEGIES AND INTERPRETATION	13
3.9	POSSIBLE LIMITATIONS AND CHALLENGES OF THE STUDY	14
3.10	QUALITY ASSURANCE	14
3.10.1	EXTERNAL VALIDITY	14
3.10.2	INTERNAL VALIDITY	14
3.10.3	RELIABILITY	14
3.11	ETHICAL CONSIDERATIONS	15
CHAPTER 4.	PRESENTATION OF RESULTS	16
4.1	INTRODUCTION	16
4.2	DEMOGRAPHIC PROFILE OF RESPONDENTS	16
4.2.1	WORK EXPERIENCE	16
4.2.2	GENDER IDENTIFICATION:	17
4.2.3	AGE GROUP:	18
4.2.4	EDUCATIONAL BACKGROUND:	19
4.3	RESULTS OF THE RESEARCH OBJECTIVES	21
4.3.1	OBJECTIVE 1: ANALYSIS OF CORE DIGITAL TRANSFORMATION THEMES IN THE SOUTH AFRICAN ICT TELECOMS INDUSTRY	23
4.3.1.1.	EMBRACING DIGITAL TRANSFORMATION INITIATIVES	23
4.3.1.2.	RECOGNITION OF DIGITAL INNOVATION FOR SUSTAINABLE GROWTH	24
4.3.1.3.	EFFECTIVE INTEGRATION OF DIGITAL TECHNOLOGIES	24
4.3.1.4.	CLEAR STRATEGY FOR DIGITAL TRANSFORMATION IMPLEMENTATION	25
4.3.1.5.	INVESTMENT IN DEVELOPING DIGITAL CAPABILITIES AND SKILLS	25
4.3.1.6.	CUSTOMER-CENTRIC DIGITAL SOLUTIONS AND SERVICES	26
4.3.2	ANALYSIS OF THE IDENTIFIED BARRIERS TO DIGITAL TRANSFORMATION IN THE SOUTH AFRICAN ICT TELECOMS INDUSTRY.	26
4.3.2.1.	LACK OF AWARENESS AND UNDERSTANDING	26
4.3.2.2.	FINANCIAL RESOURCE CONSTRAINTS	27
4.3.2.3.	REGULATORY ENVIRONMENT	27
4.3.2.4.	DIGITAL TALENT ACQUISITION AND RETENTION	28
4.3.2.5.	LEGACY SYSTEMS AND INFRASTRUCTURE	28
4.3.2.6.	RESISTANCE TO CHANGE AND CULTURE	29
4.3.3	ANALYSIS OF THE IMPACT OF DIGITAL TRANSFORMATION ON THE SOUTH AFRICAN ICT TELECOMS INDUSTRY BASED ON THE SURVEY RESULTS REVEALS INSIGHTFUL TRENDS AND SENTIMENTS.	29
4.3.3.1.	OPERATIONAL EFFICIENCY	29

4.3.3.2. INNOVATIVE PRODUCTS AND SERVICES.....	30
4.3.3.3. CUSTOMER ATTRACTION AND RETENTION.....	30
4.3.3.4. CUSTOMER EXPERIENCE AND SERVICE QUALITY	31
4.3.3.5. AGILITY AND RESPONSIVENESS	31
4.3.3.6. NEW BUSINESS MODELS AND REVENUE STREAMS	32
4.4 CURRENT TRENDS IN THE SOUTH AFRICAN TELECOMS INDUSTRY.....	32
4.5 CHALLENGES AND OPPORTUNITIES IN THE SOUTH AFRICAN TELECOMS INDUSTRY.....	33
CHAPTER 5. CONCLUSION AND RECOMMENDATIONS.....	34
5.1 CONCLUSION.....	34
5.2 RECOMMENDATIONS.....	34
5.3 SUMMARY OF KEY FINDINGS	35
5.4 RECOMMENDATIONS FOR FUTURE RESEARCH	36
REFERENCES.....	38
APPENDIX A: RESEARCH INSTRUMENT.....	47
APPENDIX B: PARTICIPATION INFORMATION SHEET	51
APPENDIX C: CONSENT FORM.....	52

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to investigate how digital improvements affect the South African telecommunications business, with a focus on the scarcity of ICT experts and an understanding of digital transformation (Knoesen, 2024). By identifying transformation principles, recognizing the challenges of putting them into reality, and analyzing their potential to increase the competitiveness of South Africa's ICT sector (Huawei & EY, 2022).

1.2 Context of the study

The digital transformation, encouraged by the development of digital technology, is transforming industries worldwide, including South Africa's ICT Telecommunications industry (Gigova et al., 2019). This evolution brings both opportunities and challenges, particularly in terms of Africa-European cooperation (Daniels et al., 2022). Digital transformation has a tremendous impact on innovation, with key elements including the ability to evaluate enormous data and respond to changing consumer needs (Termeleva, 2022). In the Global South, particularly South Africa, digital transformation provides chances to upgrade industrial-age infrastructure and strengthen trade negotiations (Ciuriak, 2020). However, more in-depth research is required into the specific implications of digital transformation for the South African ICT Telecommunications business, including the difficulties, opportunities, and strategies involved with this transformative process.

1.3 Research Problem

The South African ICT telecoms industry faces challenges in embracing digital transformation due to limited understanding and a shortage of ICT professionals dedicated to driving this change (Jinabhai, 2022). Research on the factors driving digital transformation in South Africa highlights the significance of organizational culture, which predicts a substantial portion of the digital transformation in the financial services sector (Ajigini & Chinamasa, 2023). The need for new leadership styles, adaptability to digital economies, and Industry 4.0 industrialization is crucial for economic growth amidst global changes (Kyriakopoulos, 2023). Addressing the gap in research specific to the South African ICT telecoms industry response to digital transformation is essential. Insights from such research can guide policymakers, industry leaders, and ICT professionals in navigating and leveraging digital transformation effectively in the South African ICT sector (Kanyane, 2023).

1.4 Research Objectives

The research objectives of this study are as follows:

1. Identify core digital transformation themes for the South African ICT Telecoms industry.
2. Identify obstacles to digital transformation in the South African ICT Telecoms industry.
3. Determine how digital transformation might enhance the competitiveness of the South African ICT Telecoms industry.

By addressing these research objectives, the study aims to contribute to the knowledge and understanding of digital transformation in the South African ICT Telecoms industry.

1.5 Rationale

The study conducted aims to provide valuable insights and recommendations to policymakers, business leaders, ICT managers, and senior employees in the South African ICT Telecoms sector by exploring the impact of digital transformation (Nkomo & Kalisz, 2023). By delving into the principles of transformation and recognizing the challenges in its implementation, this research seeks to enhance the industry's knowledge base and facilitate strategic decision-making (Wentze & Zwane, 2022). The study outcomes are anticipated to aid stakeholders in navigating the complexities of digital transformation, identifying areas for improvement, and capitalizing on the opportunities presented by this transformative process (Maponya & Naidoo, 2022).

1.6 Delimitation of the study

The research examines the digital transformation effects on the South African ICT telecommunications industry. The research examines ICT managers' and senior employees' views about digital transformation because they lead the execution of such projects. The research focuses on cloud computing, big data analytics, artificial intelligence, and the Internet of Things (IoT) as essential digital transformation themes while acknowledging supplementary digital technologies that extend beyond this research scope.

The research focuses on South Africa because its economic conditions, regulatory framework, and infrastructure differ substantially from other areas. The research evaluates digital skills gaps and infrastructure limitations in the ICT telecoms industry but does not assess broader socio-economic factors that impact other sectors.

The research obtains data through questionnaires, which employ a quantitative method to deliver empirical evidence about digital transformation themes and obstacles, and competitiveness enhancements, but restrict the ability to achieve profound qualitative understanding.

1.7 Definition of terms

Digital Transformation: Organizations use this process to embed digital technologies across their entire business structure, which transforms their operational methods and customer value delivery. The South African ICT telecoms industry implements digital transformation through cloud computing, big data analytics, artificial intelligence (AI), and Internet of Things (IoT) technologies to enhance operational efficiency, innovation, and customer experience.

ICT (Information and Communication Technology): A term that encompasses all technologies for the manipulation and communication of information. In this context, it refers to the hardware, software, networks, and related systems used in the telecommunications sector to facilitate digital transformation.

Cloud Computing: Cloud computing represents a delivery model that provides internet-based servers and storage and databases and networking, and software services, which allow organizations to use resources on demand without needing to manage hardware or infrastructure directly.

Big Data Analytics: The process of examining large and varied data sets to uncover hidden patterns, correlations, market trends, and customer preferences that can help organizations make informed business decisions. In telecoms, this is used to enhance customer experience and operational efficiency.

Artificial Intelligence (AI): The simulation of human intelligence processes by machines, especially computer systems. In telecoms, AI is used for tasks such as customer service automation, fraud detection, and network optimization.

Internet of Things (IoT): The Internet of Things refers to a system of interconnected physical devices that use embedded sensors and software to collect and exchange data. The telecom industry uses IoT to create new services and business models through real-time data sharing between devices and systems.

Digital Skills Gap: The digital skills gap refers to the discrepancy between the digital competencies organizations need to execute and maintain digital transformation and the digital abilities their employees currently hold. The digital skills gap in South Africa acts as a major barrier to digital transformation within the ICT telecoms industry.

Organizational Culture: The set of shared values, beliefs, and practices that shape how members of an organization interact and work together. A supportive organizational culture is recognized as a key driver of successful digital transformation.

1.8 Assumptions

The proposed study is grounded on the assumptions that the South African ICT Telecoms industry is currently experiencing digital transformation to varying extents (Ah et al., 2022). There is a recognized scarcity of awareness and ICT expertise among professionals in the telecoms sector, hindering the efficient advancement of digital transformation within the industry (Siwahla-Madiba & Costa, 2022). It is believed that successful digital transformation has the potential to enhance the competitiveness of South Africa's ICT Telecoms industry (Ajigini & Chinamasa, 2023). The utilization of questionnaires as a data collection method is expected to offer valuable insights into the understanding and challenges faced by ICT managers and senior employees regarding digital transformation in the telecoms sector (Madanchian & Taherdoost, 2022).

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

Digital transformation, propelled by the rapid advancement of digital technology, is fundamentally reshaping industries worldwide, including South Africa's ICT Telecoms sector (Gigova et al., 2019; Daniels et al., 2022; Termeleva, 2022; Ciuriak, 2020). This evolution presents both opportunities and challenges for the South African ICT Telecoms industry by implementing digital transformation (Knoesen, 2024). The South African ICT Telecoms sector is characterized by a scarcity of ICT experts, which poses challenges for organizations seeking to effectively implement digital transformation initiatives (Huawei & EY, 2022). While existing research underscores the importance of organizational culture in driving digital transformation within the financial services sector (Ajigini & Chinamasa, 2023) and highlights the need for new leadership styles and adaptability in the digital economy (Kyriakopoulos, 2023), a gap persists in understanding the specific implications of digital transformation for the South African ICT Telecoms business. This includes the difficulties, opportunities, and strategies involved in this transformative process, as well as the perspectives of ICT managers and senior employees within the sector (Jinabhai, 2022). Therefore, this chapter aims to review the existing literature related to the core themes, challenges, and competitive implications of digital transformation in the South African ICT Telecoms industry, identifying gaps in knowledge that will be addressed through empirical research.

2.2 Core Digital Transformation Themes for the South African ICT Telecoms Industry

The South African telecoms industry's digital transformation requires businesses to implement digital technologies that improve their operations as well as customer interactions and creative solutions (Kaya & Bozbura, 2023). Network efficiency and data speeds have improved along with consumer service innovation through the deployment of 4G and 5G networks, cloud computing, Internet of Things (IoT) integration, and big data analytics (Su et al., 2023). Telecom companies have experienced improved collaboration and decision-making through process restructuring, agile methodologies adoption, and cross-functional team creation (Ajigini & Chinamasa, 2023). The wide array of digital services provided easy connectivity information access and account management capabilities that have created positive customer experience improvements while personalized marketing strategies have been delivered to clients (Cui, 2023). Subscription-based services represent new business models that have improved value propositions across the industry (Wujarso, 2023).

These endeavors focus on enhancing operations while broadening service offerings (Lomatenkov, 2019; Berawi et al., 2020; Valdez-de-Leon, 2016). Telkom SA's transformation success can be seen through its cloud computing implementation as well as its adoption of big data analytics and artificial intelligence, according to the (Amping et al., 2019) study. Standard Bank has deployed a cloud-based analytics platform as cloud computing adoption continues to grow, according to (Davison, 2019; Hamilton, 2021; and Monzon, 2022). The BSS system of MTN now operates from the cloud after its

migration was completed by Carter in 2024. Big data analytics enables businesses such as Telco to analyze existing customer data as per David Donald et al.'s (2023) research. AI technology serves to enhance customer satisfaction and fraud prevention, according to Schoeman & Malapane (2022). The literature offers general knowledge about digital transformation themes but does not deliver detailed insights regarding theme prioritization and adaptation for South African ICT telecom companies due to skill deficits and systemic constraints. The identification of sector-specific, relevant, and practical themes demands additional empirical research.

2.3 Obstacles to Digital Transformation in the South African Telecoms Industry

The digital transformation in the South African ICT telecoms industry faces multiple challenges. The biggest challenge is the limited access to high-speed internet, which is a problem (South Africa—Information Technology, 2024; Kanyane, 2023; Ryan Hawthorne, 2015; Zaber, 2013; Zaber, 2014). Job losses in the ICT sector that happened during and after the global economic crisis have affected the skills and knowledge of the workforce. The South African recession and the effects of the crisis have both prevented network infrastructure development and created constraints on revenue and profit margins. This has led to consumers paying higher prices and getting the same or poorer services. Consumer needs for telecommunications services are shaped by worldwide technological developments in the field.

The telecoms industry in South Africa depends heavily on the development of the infrastructure, particularly in the areas of telecommunications and ICT (South Africa—Information Technology, 2024). The telecoms regulator, ICASA, is paying much attention to VoIP in its ongoing effort to reduce costs and enhance the use of the internet (Kanyane, 2023). However, ICASA has been unable to gain its effectiveness due to the lack of government independence (Ryan Hawthorne, 2015). Another major problem is the digital skills deficit (Martínez-Cantos, 2023; Tabane, 2022; Naicker & Mbengo, 2022; Alao & Brink, 2022). Several barriers to digital transformation are revealed by existing research. Very little research has been conducted to date to determine the relative importance of these obstacles from the ICT managers and senior employees within the South African Telecoms perspective. Additionally, the literature may not fully explain how these obstacles interact with one another (e.g., how skills gaps make infrastructure limitations worse). Quantitative data is needed to determine the most critical obstacles and how they interact with one another.

2.4 Potential Improvements in Competitiveness through Digital Transformation in the South African ICT Telecoms Industry

The South African ICT telecoms industry can gain many benefits from digital transformation to increase its competitiveness. The Fourth Industrial Revolution (4IR) is forcing automation in industries like Telkom SA to increase efficiency and cut costs (Roberts et al., 2021). The transition to automation may lead to job losses, which will affect disposable income and the market for ICT products and services

(Adelowotan, 2021). The South African ICT telecoms industry faces a low-growth crisis because current market presence strategies are ineffective, and the industry struggles to capture market share from rival companies. Additionally, there is an emphasis on Black economic empowerment within the industry, which stresses that growth strategies need to be inclusive as technology advances. New and existing services can be developed into an electronic format to benefit from software and hardware innovations.

The ICT Telecoms industry's digital transformation goes beyond service automation for efficiency and cost reduction to also capture new service opportunities driven by technological innovation in sectors like e-health. The social effects of digital transformation include changes in people's lifestyles and information-seeking behavior. The literature presents several ways digital transformation can enhance competitiveness. It is necessary to have empirical evidence to support these claims in the South African ICT Telecoms sector. Also, there is no clear understanding of which digital transformation initiatives are the most significant for competitiveness in this case, and what strategies organizations can apply to benefit from digital transformation. This calls for an empirical investigation of the digital transformation initiatives in the industry based on lived experiences and observed outcomes.

2.5 Chapter Summary, Propositions, and Conceptual Framework

This chapter aims to investigate the current research in digital transformation in the South African ICT Telecoms industry to identify some patterns, challenges, and possible consequences on competitiveness. The review revealed several gaps in the literature. First, there is a gap in the literature regarding more detailed insights on how and to what extent the themes of digital transformation are prioritized and adapted in the context of South African ICT Telecoms companies. Second, there is limited research on the relative importance of various obstacles to digital transformation, from the point of view of ICT managers and senior employees. Finally, there is no empirical evidence to support the claims about how digital transformation can enhance competitiveness in this sector and what the most effective initiatives and strategies are. To answer these gaps, the following propositions will be empirically tested in this research:

2.5.1 Propositions

This research supports the following propositions:

- ❖ Proposition 1: Cloud computing and big data analytics are the most important digital transformation themes to ICT managers and senior employees in the South African ICT Telecoms industry.
- ❖ Proposition 2: Digital skills gap is the biggest challenge of digital transformation in the South African ICT Telecoms industry according to ICT managers and senior employees.

- ❖ Proposition 3: The digital transformation initiatives that are aimed at enhancing the customer experience have the most significant positive effect on competitiveness in the South African ICT Telecoms industry.

2.5.2 Conceptual Framework

Based on the literature review and the research objectives, below is a visual representation of the key elements influencing digital transformation in the South African ICT Telecoms Industry because of the literature review and the research objectives:

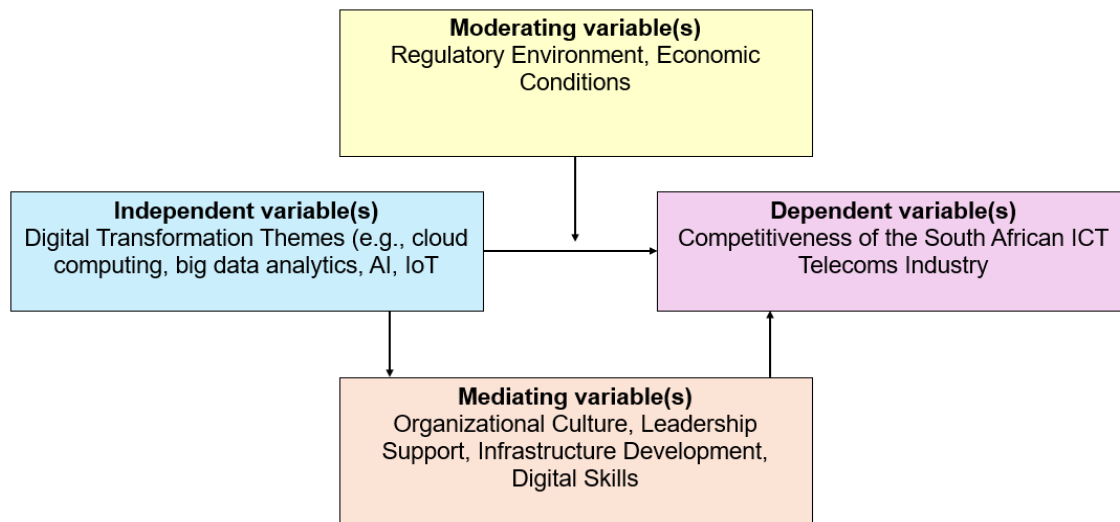


Figure 1: Conceptual Framework for Digital Transformation in the South African ICT Telecoms Industry

The contingency theory in management suggests that organizations require multiple approaches to organization and management because the most effective method depends on their internal and external conditions. According to this theory, organizations need to align their strategic plans with their structural elements and operational processes with environmental factors to achieve maximum performance. According to contingency theory, organizations must tailor their digital strategies and initiatives to their specific challenges and resources, and industry characteristics during digital transformation.

2.5.2.1 Alignment of the theory to the Research Objectives

The objectives can be analyzed through Contingency Theory because this theory shows that digital transformation success depends on organizational culture and leadership support and infrastructure and regulatory frameworks, and digital skills base (Ajigini & Chinamasa, 2023; Kyriakopoulos, 2023; Huawei & EY, 2022).

Objective 1: Core Digital Transformation Themes

The identification of digital transformation themes such as cloud computing, big data analytics, artificial intelligence, and IoT is supported by Contingency Theory as context-dependent (Kaya & Bozbura, 2023; Su et al., 2023). Telecom companies in South Africa need to choose and order these technologies according to their operational requirements, market situation, and available resources. For example, the adoption of cloud computing by Telkom SA and the migration of MTN's BSS system to the cloud (Amping et al., 2019; Carter, 2024) illustrate context-driven decisions shaped by organizational and environmental factors.

Objective 2: Obstacles to Digital Transformation

The theory explains how organizations encounter different obstacles, such as limited internet access and digital skill shortages, and regulatory issues, because of South Africa's economic and infrastructural situation (Kanyane, 2023; Martínez-Cantos, 2023; Tabane, 2022). The theory explains why obstacles have different levels of importance and effect on organizations and why specific strategies need to be developed to address them.

Objective 3: Enhancing Competitiveness

According to contingency theory, digital transformation initiatives for competitiveness improvement require alignment with organizational context (Roberts et al., 2021; Adelowotan, 2021). The greatest competitive advantage from customer experience initiatives emerges when they match organizational capabilities and market demands.

Integration with the Conceptual Framework

The conceptual framework established for this study (Figure 1) is inherently grounded in contingency theory. The model shows that digital transformation themes affect competitiveness through organizational culture and leadership support, infrastructure, and digital skills gap as mediating factors. The regulatory environment and economic conditions affect these relationships, which supports the contingency perspective that effectiveness depends on specific contexts.

The study uses empirical testing of propositions about digital transformation theme prioritization obstacles and competitiveness effects to apply Contingency Theory for generating practical insights for South African ICT managers and policymakers, and industry leaders.

The following chapter will present the research methodology that will be used to test the propositions empirically, including the research design, data collection methods, and data analysis techniques.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Research Approach

The study on digital transformation in the South African ICT telecoms industry will benefit from a quantitative approach to assess core concepts, obstacles, and competitiveness improvements. Research in the South African business sectors (Jeza & Mpele Lekhanya, 2022) and the financial services sector (Ajigini & Chinamasa, 2023) highlights the impact of digital technologies on organizations. Additionally, insights from the telecommunications industry emphasize the adoption of advanced technologies like AI, IoT, big data, and cloud computing. Understanding the factors driving digital transformation, such as organizational culture, leadership, and employee skills (Siwahla-Madiba & Costa, 2022), will be crucial for concluding. Challenges like cybersecurity risks and the need for upskilling the workforce must be considered to enhance competitiveness.

3.2 Research Design

The research design for collecting data from ICT managers and senior employees in Telecoms regarding digital transformation will be cross-sectional, providing a snapshot of their understanding, perceptions, and experiences at a specific point in time (Fahmi et al., 2023). This approach allows for a comprehensive examination of factors influencing digital transformation, such as digital culture, legacy culture, and digital literacy, which significantly impact employee attitudes and perceived performance (Bouarar et al., 2022). Additionally, the study can benefit from insights into the challenges of adopting digital transformation, including resistance to change, lack of digital expertise, and inflexible culture, which may affect the readiness of individuals to embrace digital initiatives (Carroll et al., 2023). By incorporating these aspects into the research design, a holistic understanding of the current landscape and potential strategies for successful digital transformation in Telecoms can be achieved.

3.3 Population and Sample

3.3.1 Population

The target population for this study consists of ICT managers and senior employees working within South African ICT Telecoms companies. Estimating the exact population size is challenging due to the lack of publicly available data on the number of ICT managers and senior employees in the South African ICT Telecoms industry. However, based on industry reports and estimates, it is reasonable to estimate the population to be between 30 862 and 35 000 individuals (*ICASA: The State of the ICT Sector Report of South Africa*, 2024). This estimate includes individuals in management and leadership positions within various ICT Telecoms companies operating in South Africa, such as Telkom, MTN, Vodacom, Cell C, and other smaller players in the industry.

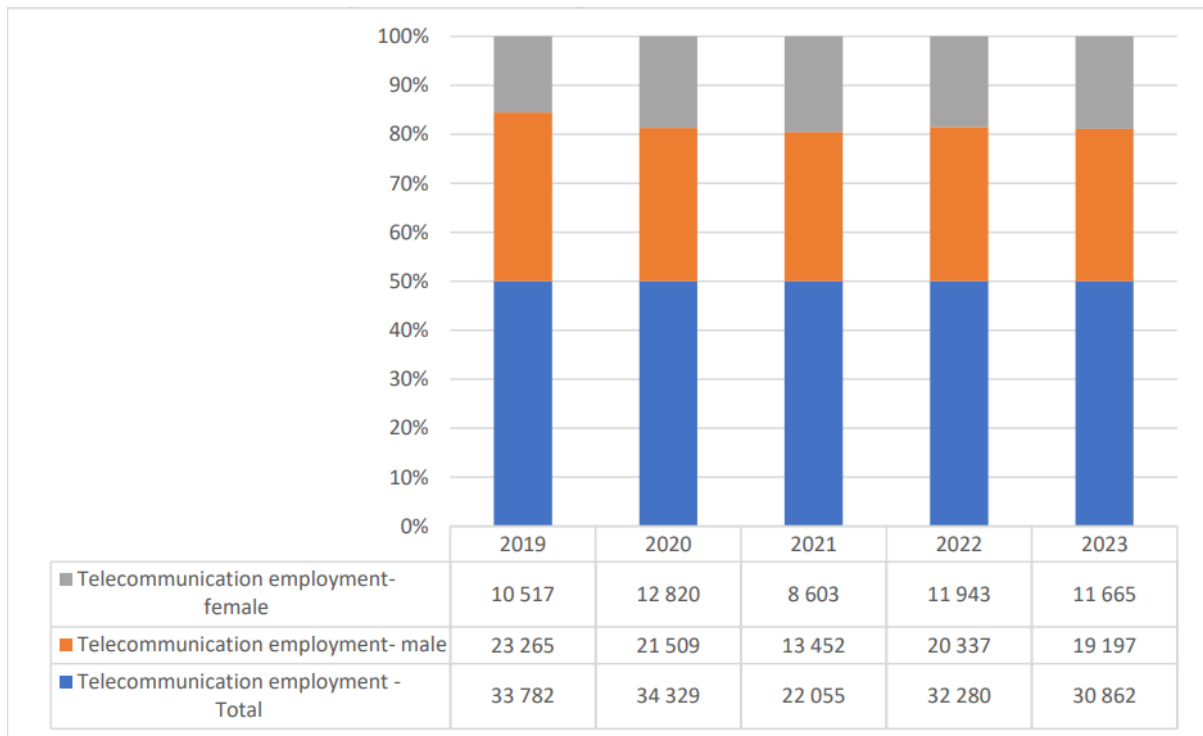


Figure 2: Persons employed in the telecommunications sector, as of the 30th of September each year – Adapted from (ICASA: *The State of the ICT Sector Report of South Africa*, 2024)

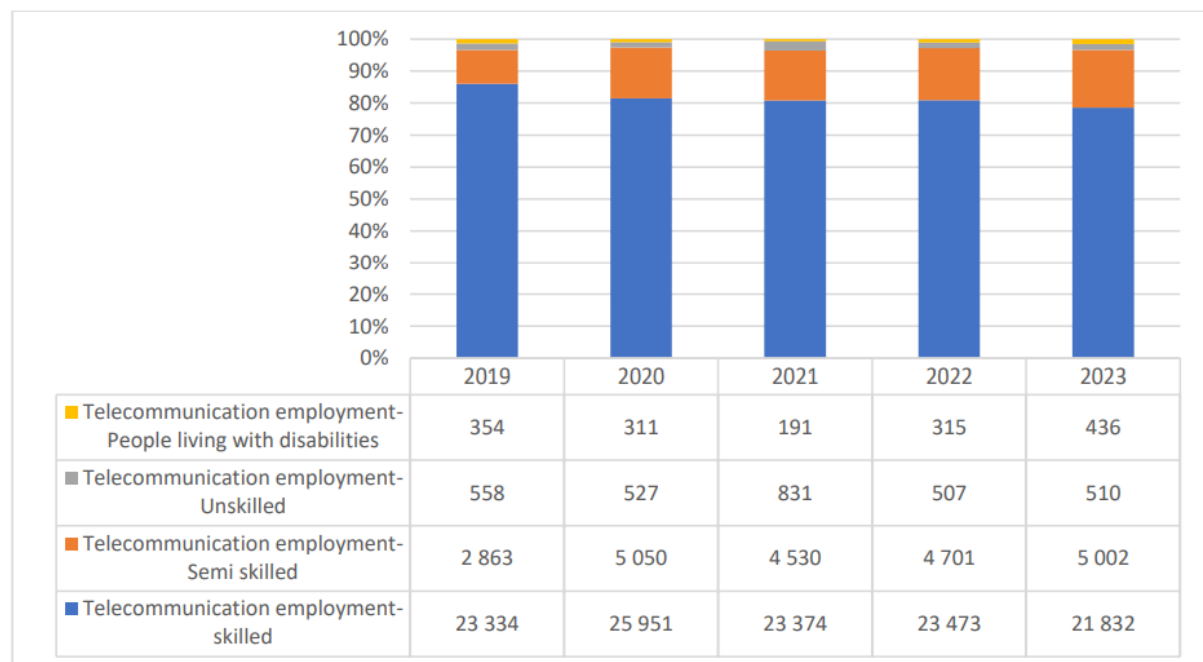


Figure 3: Persons employed in the telecommunications sector breakdown from 2019 to 2023 – Adapted from (ICASA: *The State of the ICT Sector Report of South Africa*, 2024)

3.3.2 Sample and Sampling Method

In this study, 123 respondents were chosen. Although a larger sample size would generally offer more statistical power than $N = 123$, a sample of 123 is considered sufficient for the following justifications:

- a) Practical Constraints: In this study, a pragmatic data collection approach was used because of resource limitations and time constraints.
- b) Targeted Sampling: The survey was sent to ICT managers and senior employees of the South African ICT Telecoms industry through targeted channels. This targeted approach enhanced the probability of obtaining relevant and representative data.
- c) Data Saturation: The data analysis showed clear patterns and themes in the responses which suggest that data saturation was attained, and that other data collection would probably not produce many new insights.

3.4 Unit of Analysis

The research selects ICT telecommunications industry organizations in South Africa through participant selection of ICT managers and senior employees. The research objectives led to this participant selection because they examine digital transformation adoption and challenges, and effects from the perspective of those who lead its planning and execution.

The study targets ICT managers and senior employees because they possess firsthand knowledge about digital transformation projects within their organizations. The selected respondents possess both decision-making power for digital strategies and oversight responsibility for their implementation, which makes them the most valuable source for research questions.

3.5 Data Collection Methods

Data was collected using a structured survey questionnaire (see Appendix A). The questionnaire was designed based on the literature review and research objectives and included closed-ended questions. The questionnaire was administered online using a survey platform (Google Forms).

3.6 Survey Instrument

The survey questionnaire consisted of the following sections:

Section 1

- ❖ Demographic Information: This section collected data on respondents' years of experience, age group, gender, and educational background.

Section 2

- ❖ Digital Transformation Themes: This section assessed respondents' perceptions of the importance of various digital transformation themes (e.g., cloud computing, big data analytics, AI, IoT) using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).
- ❖ Obstacles to Digital Transformation: This section asked respondents to rate the severity of various obstacles to digital transformation (e.g., infrastructure limitations, digital skills gap, lack of leadership support) using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). Respondents were also asked to identify the most significant obstacle.
- ❖ Impact on Competitiveness: This section assessed respondents' perceptions of the impact of digital transformation initiatives on various aspects of competitiveness (e.g., efficiency, customer experience, innovation) using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

3.7 Procedure for Data Collection

This paper highlights several crucial steps that make up the procedure for data collection (Dinnes et al., 2023). The research objectives and literature review results should guide the development of a questionnaire for data collection. A small group of ICT managers and senior employees should first pilot-test the questionnaire through initial findings to determine its clarity, validity, and reliability before making alterations as suggested by (Salmia, 2023). After getting the necessary ethical approvals, make the finalized questionnaire available to the sample via email and online platforms. Remind participants about the survey and extend the deadline if necessary to maximize the response rate (Wilkinson, 2023). After that, obtain completed questionnaires and check for accurate and consistent data.

3.8 Data analysis strategies and interpretation

For the study, data analysis strategies entailed the use of statistical methods such as descriptive statistics, frequencies, and percentages to summarize participant responses to the closed-ended questions. The tools used for data analysis include SPSS or Excel to compare the results with the research objectives and questions. This process of identifying patterns, trends, and connections within the data to derive insights on transformation, challenges, and opportunities to enhance competitiveness in the South African ICT telecoms sector is described by (Nag & Ahmad Malik, 2023) (Sah, 2022).

3.9 Possible limitations and challenges of the study

The study on ICT Telecoms in South Africa may have several limitations and challenges (Latchu, 2022). Due to the convenience and purposive sampling methods, sampling bias may not capture the entire population of ICT managers and senior employees, due to which the study may not be very generalizable. Response bias may also impact data accuracy because of social desirability bias. Data collection constraints may prevent participant engagement or response rates that would allow for an adequate number of participants or timely responses. These challenges are significant because they emphasize the need to acknowledge and address possible biases, constraints, and limitations to increase the validity and reliability of the study in portraying the realities of the industry.

3.10 Quality Assurance

3.10.1 External Validity

To enhance external validity, the researcher selected a diverse sample of ICT managers and senior employees in the telecommunications industry in South Africa using convenient sampling. This approach is in conformity with the principle of having many participants to obtain a full picture of the industry (Ndlovu, 2022). Therefore, this approach has been used to gather information that reflects the realities and experiences of several people, and therefore the research findings can be more generalizable and applicable.

3.10.2 Internal Validity

To ensure the credibility of the study, the researcher followed a structured approach in developing the questionnaire (Leon et al., 2022; Taherdoost, 2022). This involves assessing existing tools, drafting clear questions, conducting expert reviews, pilot testing for clarity, and employing appropriate data analysis methods (Oben, 2021). Pilot testing is crucial to confirm the questionnaire's clarity and reliability before data collection. By aligning the questionnaire with research objectives and established principles, the researcher can minimize errors and biases in the study.

3.10.3 Reliability

To ensure the trustworthiness of the data, the researcher performed standardized data quality checks and reporting as reported by (Blacketer et al., 2021). The recommendation by (Lv & Zhu, 2020) on checking the trustworthiness of data sources will also be useful, and the use of a systematic trustworthiness assurance system, as recommended by (Bertino, 2015), will be applied. When these measures are combined with statistical methods to assess data coherence and dependability, the data-gathering process will have significantly more trustworthy data.

3.11 Ethical Considerations

The following were observed in relation to ethical concerns in the research process:

- ❖ **Informed Consent:** All the respondents were explained the general purpose of the study, how the data would be collected, and they were told that they could drop the study at any stage. All participants in this study filled in the survey questionnaire only after they gave consent to participate in the study.
- ❖ **Confidentiality:** Participants were told that their responses would be anonymous and that their personal information would not be disclosed to anyone else.
- ❖ **Anonymity:** There was no need to know the respondents' names or any other personal information.
- ❖ **Voluntary Participation:** The study was conducted on willing participants, and respondents were free to participate or not without any consequences.

CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the findings of the research on the effects of digital transformation in the South African ICT telecoms industry. The study sample was made up of ICT managers and senior employees from the sector, including telecommunications companies, technology providers, and ICT consulting firms. The data was collected through a survey to determine the core digital transformation themes, the barriers encountered, and the resource constraints in the industry. This analysis gives a picture of the strategic objectives that the South African ICT telecoms industry sets in line with digital transformation initiatives and the challenges that it faces. In addition, it offers insights into how the industry is responding to the call for digital transformation while facing the existing barriers. The findings are based on the survey responses and are categorized into the following key themes: strategic alignment, awareness, financial constraints, regulatory environment, talent acquisition, legacy systems, and cultural resistance.

4.2 Demographic Profile of Respondents

It is important to understand the demographic profile of respondents to place the findings in context and to ensure that the sample is diverse and representative of industry perspectives.

4.2.1 Work Experience

Out of the respondents, the greatest number, 50.4%, has more than 16 years of experience, which means that the survey has been able to capture the information from the most experienced professionals. A third of the respondents have 10-15 years of experience, which also confirms the presence of experienced professionals. The percentage of respondents with 2-5 years (8.1%) and 6-9 years (10.6%) of experience is also quite low. The last group is the smallest and includes respondents who have worked for less than one year (3.3%). This means that the perspectives are mainly from people who have a lot of experience in the industry. Refer to Table 1 and Figure 4 for more details.

Table 1: Work Experience

Work Experience	Frequency	Percent
10 – 15 years	34	27,6
16 years and above	62	50,4
2 – 5 years	10	8,1
6 – 9 years	13	10,6
Less than 1 year	4	3,3
TOTAL	123	100

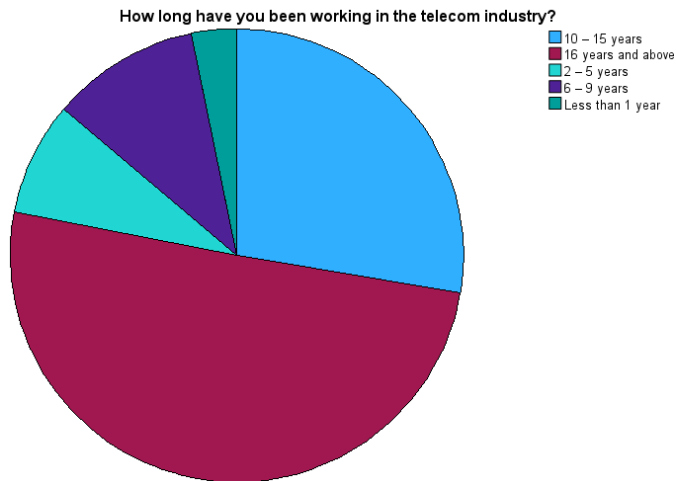


Figure 4: Work Experience

This is because the respondents' variety of experience levels offers a comprehensive view of the digital transformation landscape between the two veteran professionals and those relatively new to the industry. It ensures that the findings of the study represent a well-rounded understanding of the perception of digital transformation and its effect on the competitiveness of the South African ICT telecoms industry.

4.2.2 Gender Identification:

Most of the respondents, 69.1%, identified as male, with 29.3% identifying as female. A small portion of respondents identified as non-binary/non-conforming or preferred not to respond. Refer to Table 2 and Figure 5 for more details.

Table 2: Gender Identification

Gender Identification	Frequency	Percent
Female	36	29,3
Male	85	69,1
Non-binary/non-conforming	1	0,8
Prefer not to respond	1	0,8
TOTAL	123	100

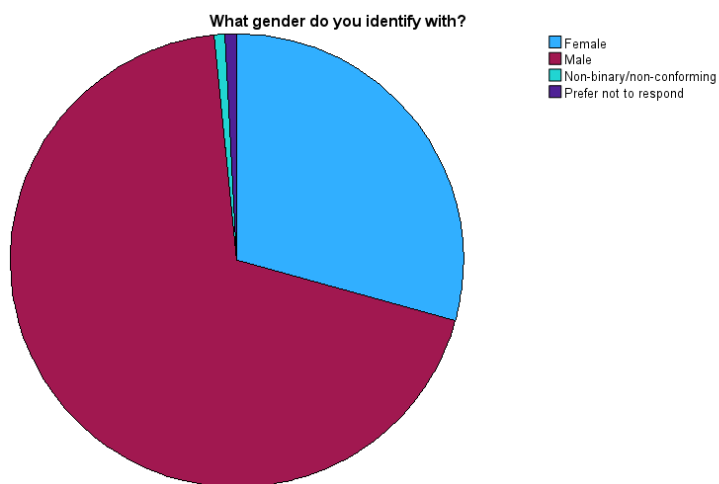


Figure 5: Gender Identification

4.2.3 Age Group:

The respondents were mainly in the age group of 36–45 years and thus 48.8% of the sample. This was followed by 32.5% in the 46–60 years age group; hence, most of the respondents are experienced professionals in mid- to senior-level management positions. Refer to Table 3 and Figure 6 for more details.

Table 3: Age Group

Age Group	Frequency	Percent
18 – 25 years old	1	0,8
26 – 35 years old	17	13,8
36 – 45 years old	60	48,8
46 – 60 years old	40	32,5
61 years and above	5	4,1
TOTAL	123	100

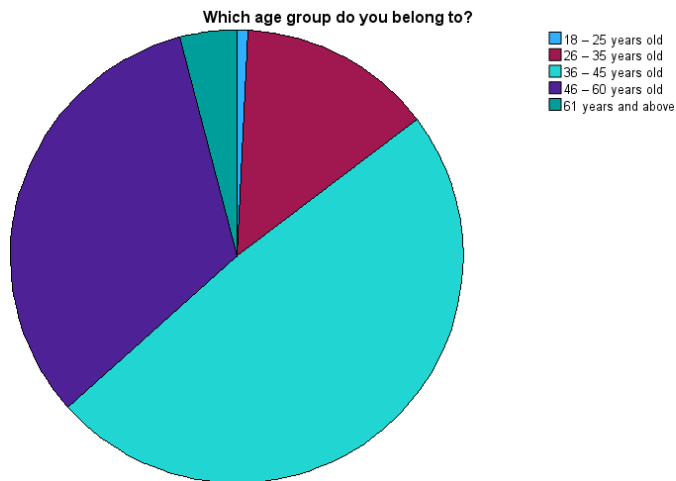


Figure 6: Age Group

4.2.4 Educational Background:

More than half of the respondents have a bachelor's degree (52.8%) or master's degree (27.6%), thus making this sample rather selective in terms of education. This demographic characteristic highlights the credibility of the participants' views on digital transformation, as they are well-placed to comment on the effectiveness of the strategies being employed. Refer to Table 4 and Figure 7 for more details.

Table 4: Educational Background

Educational Background	Frequency	Percent
Bachelor	65	52,8
Intermediate	16	13,0
Masters	34	27,6
Matric	4	3,3
MPhil/PhD	4	3,3
TOTAL	123	100

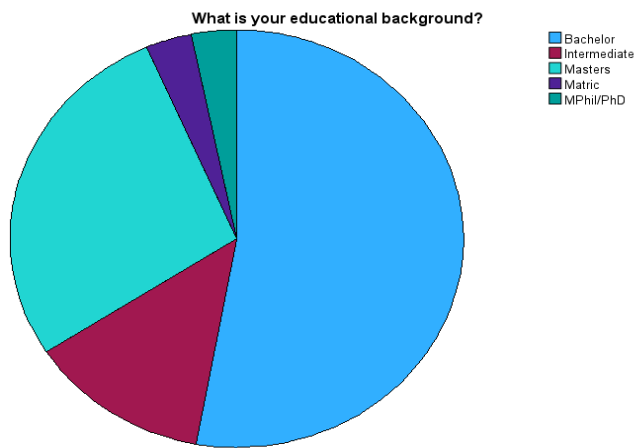


Figure 7: Educational Background

With these demographic data of the respondents, a general and detailed analysis can be made, and the results can be said to be valid. The next few sections of this paper will present the survey results, themes, and barriers that were identified and recommendations for the South African ICT telecoms industry after discussing the research method.

4.3 Results of the research objectives

Table 5 presents the distribution of responses for the 18 survey statements, organized by the three research objectives: core digital transformation themes, obstacles to transformation, and competitiveness. The results are reported as the percentage of respondents who agreed, disagreed, or were neutral for each statement, facilitating direct comparison across objectives.

Table 5: Research survey results

Objective 1: Analysis of Core Digital Transformation Themes in the South African ICT Telecoms Industry							
Objective	Survey Statement	Agree (%)	Disagree (%)	Neutral (%)	Strongly Agree (%)	Strongly Disagree (%)	Total Responses (n)
Embracing Digital Transformation Initiatives	The South African ICT Telecoms industry is actively embracing digital transformation initiatives	53.7	7.3	4.9	32.5	1.6	123
Recognition of Digital Innovation for Sustainable Growth	The South African ICT Telecoms industry recognizes the importance of digital innovation for sustainable growth	48.8	2.4	5.7	41.5	1.6	123
Effective Integration of Digital Technologies	The South African ICT Telecoms industry is effectively integrating digital technologies into its operations	52.8	5.7	9.8	30.9	0.8	123
Clear Strategy for Digital Transformation Implementation	The South African ICT Telecoms industry demonstrates a clear strategy for digital transformation implementation	48.8	9.8	16.3	22.8	1.6	123
Investment in Developing Digital Capabilities and Skills	The South African ICT Telecoms industry invests significantly in developing digital capabilities and skills	41.5	17.9	17.1	22	1.6	123
Customer-Centric Digital Solutions and Services	The South African ICT Telecoms industry prioritizes customer-centric digital solutions and services	43.9	11.4	19.5	21.1	4.1	123
Objective 2: Analysis of the identified barriers to digital transformation in the South African ICT telecoms industry							
Objective	Survey Statement	Agree (%)	Disagree (%)	Neutral (%)	Strongly Agree (%)	Strongly Disagree (%)	Total Responses (n)
Lack of Awareness and Understanding	There is a lack of awareness and understanding of the benefits of digital transformation within the South African ICT Telecoms industry	38.2	24.4	21.1	8.1	8.1	123

Financial Resource Constraints	The South African ICT Telecoms industry struggles to secure sufficient financial resources for digital transformation projects	32.5	24.4	22	15.4	4.9	123
Regulatory Environment	The existing regulatory environment poses obstacles to digital transformation in the South African ICT Telecoms industry	31.7	26	22	17.1	2.4	123
Digital Talent Acquisition and Retention	The South African ICT Telecoms industry faces difficulties in acquiring and retaining digital talent	38.2	15.4	21.1	22	2.4	123
Legacy Systems and Infrastructure	Legacy systems and infrastructure hinder the progress of digital transformation in the South African ICT Telecoms industry	45.5	13	15.4	25.2	0.8	123
Resistance to Change and Culture	The South African ICT Telecoms industry encounters resistance to change and a lack of digital transformation culture	36.6	30.1	14.6	14.6	4.1	123
Objective 3: Analysis of the feedback on the impact of digital transformation on the South African ICT telecoms industry based on the survey results reveals insightful trends and sentiments							
Objective	Survey Statement	Agree (%)	Disagree (%)	Neutral (%)	Strongly Agree (%)	Strongly Disagree (%)	Total Responses (n)
Operational Efficiency	The adoption of digital technologies can enhance the operational efficiency of the South African ICT Telecoms industry, leading to increased competitiveness	29.3	0.8	5.7	62.6	0.8	123
Innovative Products and Services	Digital transformation enables the South African ICT Telecoms industry to deliver innovative products and services, giving it a competitive edge	36.6	0.8	4.9	54.5	1.6	123
Customer Attraction and Retention	The South African ICT Telecoms industry's investment in digital transformation positively impacts its ability to attract and retain customers	39	4.9	8.9	46.3	0.8	123
Customer Experience and Service Quality	Digital transformation initiatives can differentiate the South African ICT Telecoms industry from its competitors in terms of customer experience and service quality	49.6	0.8	7.3	41.5	0.8	123

Agility and Responsiveness	The South African ICT Telecoms industry's embrace of digital transformation enhances its agility and responsiveness to market changes, boosting competitiveness	45.5	4.9	10.6	38.2	0.8	123
New Business Models and Revenue Streams	Digital transformation empowers the South African ICT Telecoms industry to explore new business models and revenue streams, strengthening its competitive position	44.7	4.9	7.3	42.3	0.8	123

4.3.1 Objective 1: Analysis of Core Digital Transformation Themes in the South African ICT Telecoms Industry

4.3.1.1. Embracing Digital Transformation Initiatives

A supermajority of the respondents (86.2%) agreed or strongly agreed that the South African ICT telecoms industry is currently implementing strategies to support digital transformation. This, therefore, points to a high level of awareness of the need for change within the sector, which is a positive indication of the perception of the industry regarding the adoption of new technologies and methods to improve performance and interaction with the customer. Refer to Table 5 for more details.

The effects of actively implementing digital transformation strategies in the South African ICT telecoms sector are far-reaching and varied. First, increased operational efficiency is a primary benefit that one is likely to derive from the adoption of digital technologies that are likely to enhance the operational processes reduce costs, and increase productivity. Thus, telecommunication firms may analyze and develop better strategies for the effective use of their resources in a very competitive environment. Second, digital strategies enhance customer engagement. Companies can offer personalized services, better communication channels, and innovative solutions to enhance customer experience and loyalty.

Furthermore, the digital transformation strategy is proactive, and it helps telecom companies to gain a competitive advantage over their competitors. Thus, organizations can improve their performance on market changes and customer needs responses and sustain themselves in the changing environment. Finally, digital transformation brings about many innovation opportunities for telecom companies. With the help of new technologies, organizations can identify new business strategies and new products and services that would lead to the growth of revenue and value for customers. Hence, the implications of digital initiatives on operational effectiveness, customer relations, competitive position, and innovation in the South African telecoms sector cannot be overemphasized.

4.3.1.2. Recognition of Digital Innovation for Sustainable Growth

The survey revealed that 90.3% of participants recognized the role of digital innovation in the sustainable growth of the industry. This is the idea that no one has bought into the fact that digital transformation is not a trend but a key to long-term sustainability and competitiveness in a rapidly changing market environment. Refer to Table 5 for more details.

The acknowledgment of digital innovation as vital for sustainable development is a good starting point for the formulation of strategic plans that focus on the integration of technology and the enhancement of business processes. Therefore, understanding the role of digital innovation is important for telecom companies to improve their market position by using new technologies to address customers' needs. In addition, the digital transformation of these companies also makes them more attractive to investors who are interested in supporting sustainable and innovative companies, which in turn enhances the financial strength and growth prospects. This comparison with digital innovation also helps the South African telecom sector to be consistent with the global trend of sustainability and thus be able to engage in international markets and programs that are related to green technology.

4.3.1.3. Effective Integration of Digital Technologies

The results show that 83.7% of the respondents said that the industry is aligning digital technologies to its operations effectively. This means that telecom firms are enhancing the strategic placement of the business strategies of digital strategies, which is critical to enhancing service delivery and operational flexibility. Refer to Table 5 for more details.

The effective use of digital technologies in the South African ICT telecoms industry has a crucial impact on performance by operations and customer interaction. Improved operational efficiency is one of the primary benefits as well because the integration of digital solutions can improve processes, decrease operational costs, and increase efficiency. Hence, companies that can implement digital tools effectively can enhance their processes and utilize their resources more effectively, which results in better performance overall. Furthermore, this paper finds that improved customer experience is a major result of this integration. Thus, the use of digital solutions and telecom companies can offer better customer service through personalized offerings, fast response times, and better communication channels, which in turn leads to higher customer satisfaction and loyalty.

However, one of the most important consequences of integrating digital technologies is increased agility. Those companies that have embraced these technologies can react more quickly to changes in the market and shifting consumer needs and desires, which is crucial in a competitive environment where consumer preferences are constantly shifting. This agility allows telecom companies to remain relevant and proactive in their service delivery. Last, the integration is effective in creating a conducive environment for innovation so that companies can offer new products and services that can make them

stand out in the market. Through the development of digital tools that support innovation, telecom firms can come up with new strategies for growth and remain competitive in a digital economy. Therefore, these recommendations imply that digital integration can greatly improve the performance of operational effectiveness, customer relations, agility, and innovation in the South African telecom sector.

4.3.1.4. Clear Strategy for Digital Transformation Implementation

71.6% of respondents felt that there is a clear strategy for implementing digital transformation within the industry, but 16.3% remain neutral, and 9.8% disagree. While this still represents a majority, it highlights a potential area for improvement, as clarity in strategic direction is crucial for successful execution and alignment across various departments. Refer to Table 5 for more details.

It is very important to have a clear strategy to align the efforts of all departments to the digital transformation strategy. Without this clarity, organizations are likely to be engaged in fragmented initiatives that do not contribute to the overall business objectives, which in turn results in poor performance and costs. Furthermore, without a clear strategy, it is possible to mismanage the resources that are available for digital initiatives. These include a lack of direction, which may also cause the employees to feel lost in the digital transformation process, which in turn may lead to low morale and productivity. Another issue is the increased risk of failure in digital transformation projects; without a clear strategy, teams may not know what priorities and objectives to follow, putting the success of these initiatives at risk. These will be important to ensure maximum realization of the opportunities for digital transformation and to create a unified organizational strategy and correcting these problems will be important.

4.3.1.5. Investment in Developing Digital Capabilities and Skills

The survey showed that 63.5% of participants believe that significant investments are being made in developing digital capabilities and skills, but 17.1% remain neutral, and 17.9% disagree. This finding points to a critical gap, as continuous investment in human capital and technological infrastructure is necessary to sustain innovation and adapt to market changes. Refer to Table 5 for more details.

Ignoring spending on digital training skills for the workforce creates major skill shortages in labor markets, which diminishes corporate effectiveness as organizations face an increasingly complex digital environment. If organizations fail to innovate because of neglecting human capital development, they may not be able to come up with new products and services that the customers want in the new world. Therefore, companies are left with having to reward talent from outside the company or offshore due to a lack of in-house skill development, which is costly and cannot be used to meet the company's particular requirements. In addition, there is low productivity as employees are unlikely to be motivated

in their work as there are few chances for career growth and skill development, and they are likely to feel unappreciated. Therefore, the identified challenges are evidence of the need to invest in the skills of the employees of telecom companies to ensure that the company remains innovative and a pacesetter in the digital economy.

4.3.1.6. Customer-Centric Digital Solutions and Services

A total of 65% of respondents indicated that the industry prioritizes customer-centric digital solutions and services, but higher neutral (19.5%) and disagree (15.5%) responses indicate potential areas for improvement. This reflects an understanding among telecom companies that enhancing customer experience through tailored solutions is vital for retaining competitiveness and fostering customer loyalty. Refer to Table 5 for more details.

Focusing on the customer's needs and wants will increase customer loyalty because happy customers will stick with the companies that understand them and address their needs. So, it is possible to effectively implement customer-centric strategies that can help telecom companies stand out from the crowd, acquire new clients, and keep the old ones. Additionally, the focus on customer needs may contribute to the creation of new products and service solutions, which can become the source of additional revenue and improve the overall performance of the company. Moreover, the concept of customer-centricity also means that organizations must proactively seek their customers' feedback to improve service delivery and product development.

4.3.2 Analysis of the identified barriers to digital transformation in the South African ICT telecoms industry.

4.3.2.1. Lack of Awareness and Understanding

The results showed that a significant 38.2% of the respondents were in agreement with the notion that there is a low level of knowledge and understanding of the advantages of digital transformation. This means that there may be some stakeholders who do not appreciate how digital strategies can improve business processes and customer interactions. The cumulative percentage indicates that 53.6% either disagreed or remained neutral about this statement, highlighting a potential gap in communication and education within the industry. Refer to Table 5 for more details.

Resistance to change is a major issue that can be encountered by various stakeholders while implementing digital transformation strategies, and the root of this resistance is often the stakeholders' ignorance of the advantages of the strategies in question. This resistance can slow down organizations and hold back progress and innovation. Besides that, if digital initiatives are not understood and accepted, they may be implemented incorrectly or may not achieve the expected results, which will lead to the wastage of resources and non-realization of potential growth. Moreover, a lack of knowledge can also hamper the recognition and evaluation of new and innovative technologies that may improve operations and interaction with customers. Therefore, as a result, organizations can be left behind in

the current market environment, not being able to gain all the possible benefits from digital transformation. These challenges can be met and overcome with the help of communication and education of stakeholders on the benefits of digital initiatives to create an environment of acceptance and active participation in the transformation process.

4.3.2.2. Financial Resource Constraints

This is clear as 32.5% of the respondents agreed and 15.4% of them strongly agreed with this statement. This is in line with industry-wide practices where financial constraints make it impossible to allocate enough resources towards technologies and infrastructure, which is in sync with external research that points out that only 22% of telecom companies have been able to implement digital initiatives successfully (South African Telecoms Companies to Accelerate Digital Transformation in 2023, n.d.). Refer to Table 5 for more details.

Restrictive budgets can cause important delays in the execution of digital transformation strategies that are vital for enhancing operational effectiveness and customer interaction. As a result, when telecom companies have financial problems, they are unable to spend money on new technologies and enhancement of the infrastructure, which hinders their innovation and ability to respond to the changes in the market. This lack of investment may put these companies at a competitive disadvantage, those who cannot raise the funds may not be able to improve their digital operations and gain market share and, therefore, profitability. In addition, the costs of preserving legacy systems and infrastructure can also be high, which further depletes the financial resources and only serves to extend underinvestment that worsens the efficiency. Therefore, the identification of funding issues is crucial for the effective implementation of digital transformation and the long-term viability of companies in the telecommunications industry.

4.3.2.3. Regulatory Environment

The results showed that more than one-third of the respondents (31.7%) thought that the current regulatory environment is a barrier to digital transformation. This points to problems in compliance costs and bureaucratic hurdles that may well stifle innovation and adaptability in telecom operations. Refer to Table 5 for more details.

Policies and regulations can hamper innovation in the telecom sector by restricting the adoption and use of new technologies. This in turn restrains their capacity to innovate and meet the customer's needs and demands. Furthermore, complying with numerous regulations is costly and therefore limits the company's spending on technology and infrastructure that are critical. These increased operational costs may also limit the company's capacity to adapt and grow. In addition, regulatory approval processes can delay projects, which could be detrimental in a fast-growing digital environment. A very strict regulatory framework may also hinder new market entrants and startups and thereby limit

competition and result in monopolies. Therefore, the interaction of strict regulations is a major threat to telecom companies as they strive to be competitive and innovative in a market that is becoming more dynamic. These regulatory challenges, however, need to be tackled through advocacy and reform to promote growth and advancement in technology.

4.3.2.4. Digital Talent Acquisition and Retention

In the survey, 38.2% of participants chose the challenge of acquiring and retaining digital talent, supporting the statement. This sector needs telecom to have a competitive ability to foster innovation and implement digital strategies effectively. Refer to Table 5 for more details.

The major issue that companies may encounter is a lack of skilled workers, which may lead to extra costs of hiring new personnel, and this may well involve engaging expensive consultants or contractors. The financial and operational strategies of the company can also be affected by this dependence. Lack of expertise can also result in substandard quality of digital projects and the development of inefficient solutions that may not be the best for the organization or the customer. Not all companies can find and hire the best talent to support their innovation and enhance their service delivery capabilities that would have otherwise given them a competitive edge over their competitors. Therefore, the closure of skill gaps through targeted learning and development is critical for the success of digital transformation and competitive strategy.

4.3.2.5. Legacy Systems and Infrastructure

According to the findings, 45.5% of respondents are of the view that legacy systems are a major hindrance to progress and are a barrier to digital transformation efforts. This is in conformity with the literature review, which indicates that outdated infrastructure can significantly slow down the adoption of new technologies (Malunga, 2023). Refer to Table 5 for more details.

Legacy systems are a problem for telecom companies because they do not possess the flexibility needed to work with the new technologies. This lack of flexibility can be a barrier to innovation and change, stopping organizations from creating new products and services that are necessary to succeed in a digital world. Furthermore, the expense of preserving these obsolete systems is a major burden on IT budgets, i.e., 60–80%, which leaves little or no funding for innovation and improvement strategies. This could also limit the company's funding of important upgrades or new technologies that may be needed. In addition, the rigidity of traditional systems can cause some delays in project implementation since the integration of new technologies is often time- and cost-consuming. Such delays are damaging business agility and speed to market in a world of dynamic changes.

Moreover, old systems are generally more prone to security threats and can be costly to remedy, as well as harm the company's reputation. Cyber threats are constantly changing, and therefore, relying on outdated technology increases the risk of exposure. In addition, legacy systems may not enable the seamless and high-quality customer journeys that are desired by today's consumers. Poor customer experiences may lead to customer dissatisfaction, which is damaging the company's standing. These challenges must be met and overcome so that telecom companies can sustain and grow in a digital environment.

4.3.2.6. Resistance to Change and Culture

There is resistance to change within organizational culture since 36.6% of respondents agreed and 14.6% of them strongly agreed that lack of digital transformation culture is evident in the industry. This cultural disinterest can hinder organizations from embracing new digital practices that are necessary for competitive survival. Refer to Table 5 for more details.

Organizational disinterest can slow down the implementation of digital technologies and processes and hamper the digital initiatives of companies so that they are unable to gain the advantages of digital transformation. It is, therefore, important to realize that a culture that is resistant to change will kill the creative and innovative spirit of any organization and make it difficult for it to try new business models or service offerings in a market that is changing at a fast pace. Furthermore, the resistance to change can lead to the employees feeling unappreciated or demoralized, which results in low employee morale and performance. This is because the challenge of implementing digital initiatives would be compounded by the employees' low level of engagement. This is because companies that do not develop a culture of digital transformation cannot afford to have competitors who are more flexible and ready to change with new technologies and market trends. Thus, the problems can only be solved through the help of change management strategies that will create a new organizational culture that is more flexible, innovative, and ready for digital transformation.

4.3.3 Analysis of the impact of digital transformation on the South African ICT telecoms industry based on the survey results reveals insightful trends and sentiments.

4.3.3.1. Operational Efficiency

A significant majority (62.6% strongly agree, 29.3% agree) believe that adopting digital technologies enhances operational efficiency. This strong endorsement indicates that stakeholders recognize digital transformation as a critical driver for improving processes and reducing operational costs, which is essential for maintaining competitiveness in a challenging market. Refer to Table 5 for more details.

The use of digital technologies in telecom companies can bring about many advantages that include lower costs, better service delivery, more agility, and more data-driven decision-making. Hence, by optimizing operations and systemizing routine procedures, telecom companies can greatly cut down on operational costs. This is because enhancing operational efficiency, for example, results in fast response and good service delivery, which is a key to increasing customer satisfaction and retention. This is because digital transformation enables organizations to respond more quickly to market shifts and customer needs, which creates an agile culture that is vital in the fast-moving world of telecoms. This is because digital tools also support data collection and analysis to help companies make the right decisions that enhance performance and strategic planning. All these benefits show the need to embrace digital technologies as a means to achieve business growth and sustainability in the market.

4.3.3.2. Innovative Products and Services

54.5% of respondents have chosen strong agreement to combine the statement about product and service delivery with an innovative pattern, while 36.6% have selected the agreement level to some degree. The telecoms industry is viewed as having the potential to harness digital transformation for the development of novel propositions, which could help to outcompete rivals and draw in additional consumers. This is in line with worldwide patterns that make innovation essential for growth in highly saturated markets. Refer to Table 5 for more details.

The ability of telecom companies to offer innovative products and services is key to achieving competitive differentiation in the market and bringing in new customers as well as keeping the old ones. These companies can continue to innovate and grab a bigger share of the market, especially in saturated markets where traditional products may not be enough. Moreover, innovative solutions that are close to customer needs can enhance customer satisfaction and reduce churn rates significantly. All these concentrate on innovation that not only improves customers' experience but also develops new revenue growth opportunities and diversification of the company's offerings, excluding conventional telecommunications services. Thus, innovation is critical for telecom companies to survive in this dynamic environment and to keep up with their competitors to be successful in the long run.

4.3.3.3. Customer Attraction and Retention

A combined total of 85.3% (46.3% strongly agree, 39% agree) believe that investment in digital transformation positively impacts customer attraction and retention. This finding suggests that stakeholders view digital initiatives as essential for enhancing customer engagement and loyalty, crucial factors in an industry facing intense competition from both traditional and non-traditional players. Refer to Table 5 for more details.

Digital transformation enables telecom companies to offer personalized experiences that are crucial in developing super subscribers and, in turn, enhance customer loyalty. Therefore, by using digital tools to improve customer service, these companies can distinguish themselves from other companies and, in consequence, make it easier to gain new customers while maintaining the old ones. The enhanced digital capabilities also facilitate the improvement of communication with customers and their engagement, which is crucial for the company to understand its customers' needs and wants. Therefore, as a result, the customers are more likely to buy from the upsell or cross-sell strategy for more services or products. The factors discussed above show that digital transformation is a key driver of customer loyalty, competitive advantage, engagement, and revenue growth in the telecom sector.

4.3.3.4. Customer Experience and Service Quality

Nearly 91.1% (41.5% strongly agree, 49.6% agree) feel that digital transformation can improve customer experience and service quality. Enhancing customer experience through digital means is seen as a key differentiator in the telecoms sector, which is increasingly important as consumers demand more personalized and efficient services. Refer to Table 5 for more details.

The improvement of customer experiences because of digital transformation leads to an increase in the satisfaction levels of the customers who receive personalized services, quick responses, and smooth interface. This is because, in any business, the customer is always right, and hence, the company stands to gain much from retaining them as much as possible, especially when the customers are happy. In a market that is increasingly becoming saturated with choices, it becomes important for telecom companies to offer their customers excellent customer experience to acquire new customers and retain the existing ones. That way, those companies that focus on the digital aspect of the customer experience can create a good brand identity and gain free word-of-mouth advertising from their customers. Therefore, the importance of digital transformation in improving customer loyalty, the competitive position, and the results of the telecom company can be supported by the following factors.

4.3.3.5. Agility and Responsiveness

A total of 83.7% (38.2% strongly agree, 45.5% agree) believe that digital transformation enhances agility and responsiveness. This perception highlights the importance of being able to adapt quickly to market dynamics, an essential capability for telecom companies aiming to thrive amid rapid technological advancements and evolving consumer preferences. Refer to Table 5 for more details.

Digital transformation helps telecom companies to navigate changes in the market faster and, therefore, to respond properly to shifts in customer behavior, changes in regulations, and shifts in competition. This is important to be able to grab the opportunities as they come. Furthermore, the improvement in

service delivery due to enhancement in operational efficiency enables the telecom operators to offer new services and features to the customers quickly. Organizations that adopt digital transformation are also in a better position to innovate because they can try out new technologies and business models without the constraints of legacy systems. Furthermore, telecom companies can reduce the probability of losses and increase the probability of gains with improved responsiveness, which means they can predict customers' needs and resolve issues before they become major problems, thus improving customer satisfaction. Achieving these benefits collectively shows the way digital initiatives are changing the telecom industry and enabling companies to be ready for the future.

4.3.3.6. New Business Models and Revenue Streams

The survey reveals that 86.9% (42.3% strongly agree, 44.7% agree) support the notion that digital transformation is an enabler of new business models and revenue streams. This finding highlights the possibility for telecom companies to innovate beyond traditional services and, in consequence, to create new revenue streams that are crucial for long-term sustainability in the digital economy that is increasingly becoming. Refer to Table 5 for more details.

Digital transformation enables telecom companies to expand their product portfolio and offer unique solutions that go beyond voice and data services to include IoT services, cloud computing, and smart home solutions. This diversification of the sources of revenue helps the telecom operators to explore new markets and customer bases and strengthen their market position. Through the new business models, which are often customer-relation-centered, these companies can develop new products and services that are more relevant to the consumer and thus increase consumer touchpoints. In addition, the capacity to innovate and change business models helps telecom companies maintain growth in a dynamic market environment and minimize the risks that are always present with dependence on traditional sources of revenue. All these factors support the role of digital transformation in facilitating both short-term financial outcomes and long-term strategic benefits for telecom companies in an environment of growing competition.

4.4 Current Trends in the South African Telecoms Industry

Up to 2025, the South African telecoms industry exhibits several key trends as it transforms digitally at a rapid pace (*Digital Transformation Summit | South Africa 2025*, n.d.). The expansion of 5G networks is increasing at a steady pace. It offers faster connectivity and enables the utilization of new services like IoT across different industries. The Internet of Things (IoT) adoption is also increasing at the same time as businesses are using IoT technologies to enhance their operations and gain real-time data in agriculture and smart cities. Telecom companies are also focusing on customer-centric digital solutions to enhance the user experience and are investing in personalized services and data analytics. Another trend that has been observed is the business models of the companies are diversifying and going

beyond the traditional services, including fintech, e-commerce, and cloud solutions, to create new revenue streams. Cloud computing is critical for IT solutions that are scalable and support remote work and collaboration while AI and automation optimize operations and customer service. Finally, regulatory frameworks are being adapted to support innovation and competition to encourage investment in infrastructure and to protect consumers. Hence the trends, all of which reflect the industry's focus on enhancing competitiveness through agility, innovative products, customer experience, and diverse revenue streams, are highlighted (Ecn, 2025).

4.5 Challenges and Opportunities in the South African Telecoms Industry

The current and future developments in the digital transformation process will determine the future competitiveness of the South African telecommunications industry. The main challenges are aging infrastructure that requires funding, regulatory barriers to innovation, cyber threats that are on the rise, power outages that affect production, gaps in customer satisfaction, and non-traditional competitors. However, the industry can also investigate new business models such as IoT and cloud computing, new technologies like AI and machine learning, enhanced customer relations through tailored services, infrastructure development for partnerships with service providers, sustainability as a key focus for better brand image and digital literacy initiatives to create demand and inclusivity. It will be imperative for South African telecom companies to thrive in an ever-changing and very competitive market to navigate these challenges successfully while at the same time seizing these opportunities.

CHAPTER 5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The findings from the analysis of digital transformation themes in the South African ICT telecoms industry reveal a clear understanding of the need for digital strategies among the actors of the value chain. This indicates that 86.2% of the respondents have adopted a digital transformation strategy, which means that telecom companies are not only aware of the need for change but are also in the process of implementing plans to incorporate new technologies into their operations. This proactive approach has led to more effective processes, increased agility, and the potential of new business models and revenue streams, which are important for survival in an increasingly competitive environment.

Moreover, the universal agreement (90.3%) on the importance of digital innovation as a driver of sustainable growth indicates that there is a general understanding that the need for technology and skill enhancement is vital for the long term. In their attempts to address challenges such as outdated infrastructure, regulatory issues, and changing customer demands, digital transformation will be a key determinant of a company's success or failure in the market.

5.2 Recommendations

To make sure that the South African ICT telecoms industry can gain all the advantages of digital transformation, several strategic recommendations are proposed in this paper. Telecom companies should extend and diversify their digital transformation initiatives to all areas of the business, including customer relationship management, operations, and product development. The implementation of new technologies such as AI, IoT, cloud computing, and 5G infrastructure will enhance operational efficiency and enable new and better service delivery. Also, the development of omnichannel customer engagement strategies that integrate mobile applications, social media, and chatbots will create a seamless and personalized customer experience. Organizations should also create a culture of innovation by designing work environments that allow for the generation of new ideas and the testing of new concepts. Setting up innovation hubs or separate teams to focus on new technologies can help generate new ideas, whereas comprehensive training of employees will help them to properly use digital tools.

It is crucial to build strong data analytics capabilities to generate insights from customer interactions and operational processes. Predictive analytics can help in the identification of customers' needs and market trends and thus help in the adjustment of strategic plans. Real-time monitoring systems should be put in place to measure digital transformation strategies' performance by tracking KPIs aligned to organizational goals. Partnership with technology vendors, startups, and academic institutions is also critical to enhancing innovation by providing access to new technology and knowledge. Industry

consortium collaborations can also help in the sharing of best practices and the joint growth of digital transformation efforts.

Telecom companies should continue to focus on customer-centric solutions. This will be through involving the customers in the development process through surveys, focus groups, or beta testing to make sure that the products developed meet the customers' needs. UX design will be a focus area to make digital platforms easy to use and meet the needs and expectations of customers, whereas chatbots and self-service ports can improve customer service with minimal response time. It is also very important to address the challenges of regulation. Telecom companies should work with government agencies and regulatory authorities to support policies that promote innovation, infrastructure development, competition, and consumer protection.

Another key recommendation is the exploration of new business models. Telecom companies should look to diversify their revenue streams from traditional services by offering subscription models, IoT solutions, cloud computing, and fintech services. Exploring flexible models like B2B2X partnerships will allow companies to provide integrated solutions that adapt to new market trends and patterns. Sustainability should also be emphasized in the use of renewable energy, energy-efficient infrastructure, and circular economy to enhance the brand image, as well as for compliance with international trends related to green technology. Finally, it is important to stay current on technology trends, market dynamics, and competitive moves. Mechanisms for gathering feedback on the digital transformation process and its results from employees and customers should be established to determine the effectiveness of the efforts made and the need for their adjustment during use.

5.3 Summary of Key Findings

The study of digital transformation themes in the South African ICT telecoms industry shows several important conclusions that confirm the necessity to adopt digital strategies to improve competitiveness. Some 86.2% of the respondents agree that the industry is currently in the process of digital transformation, suggesting that there is a high level of awareness of the need for change. This is a positive approach that is associated with higher efficiency, better customer relationships, and competitiveness through the application of new technologies to enhance business operations and performance as well as trend analysis.

The results also underline the key part that digital innovation plays in achieving sustainable growth, with 90.3 percent of the participants agreeing with the statement. This collective view shows the importance of continued dedication to the enhancement of technology and skills to sustain the organization's growth. Moreover, 83.7% of the participants agreed that the integration of digital technologies is effective in enhancing the agility and responsiveness of telecom companies to address changing consumer needs and market trends.

Also, 86.9% of the respondents agree that digital transformation enables the identification of new business models value propositions, and new sources of revenue. This trend shows that there is a shift from traditional services to new and creative solutions that can help expand the sources of revenue and strengthen the company's market position. In general, the survey results are optimistic about digital transformation in the South African telecoms sector, and there are many opportunities for growth and innovation.

In conclusion, although there are problems, such as obsolete infrastructure and regulatory restrictions, the results of the survey show that most respondents support digital initiatives, and therefore telecom companies have a good potential to develop these trends. Through the improvement of customer experience, innovation, and data analysis, organizations can achieve effective digital transformation that not only enhances operations but also supports long-term viability in a rapidly changing market environment.

5.4 Recommendations for Future Research

Future work in digital transformation in the South African ICT telecoms industry must focus on several key areas to improve knowledge and therefore the effectiveness of digital initiatives. First, conducting longitudinal research to understand the lasting effects of specific digital transformation strategies on performance, customers, and profits will help to reveal which approaches are most successful. This research can support organizations in their attempts to enhance their practices based on real results. Second, it is important to examine the concrete indicators that can be used to evaluate the changes in the customer experience due to the digital transformation. It can be investigated how different digital strategies affect the customer relationships, loyalty, and customer defection rates that telecom companies can use to enhance their products and services.

In addition, the comparisons between the South African telecom companies and other emerging market companies can reveal the good practices and new strategies that can be useful in the local market. Such research can highlight the good practices of digital transformation and a reference of how they can be implemented in the South African context. There is another potential area that needs further investigation: the effects of regulatory environments on the speed and success of digital transformation in the telecom sector. In the future, it will be important to understand how regulations can enable or inhibit innovation to design strategies that would meet both business and legal objectives.

Nevertheless, it is also important to address the technology adoption barriers that exist for telecom companies, particularly in rural areas where lack of access to infrastructure can be an issue. Research aimed at breaking these barriers will ensure that no one is excluded from digital services based on their region. Another important issue is part of the employees' engagement and training in successful digital transformation projects; therefore, knowing how to foster an innovative and learning culture in the organization and how it impacts employees and organizational outcomes during the change process will be helpful.

Furthermore, the opportunities for incorporating sustainability into the digital transformation plans of telecom companies need to be explored. Research could be on identifying sustainable technologies and practices that can enhance the productivity of operations and address ecological issues. Moreover, the possibility of applying new technologies such as artificial intelligence, machine learning, and blockchain in the business models of the telecom industry should also be explored, as this will help to understand how these technologies can create new value propositions and new forms of competition. Consequently, the subsequent studies can provide more insight into the above-mentioned aspects, which will be useful for the future digital transformation processes of the South African telecom companies and the overall competitiveness of the telecom sector.

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APPENDIX A: Research Instrument

Below is the research questionnaire that will be distributed online to fellow ICT colleagues in telecoms industry.

Preliminary Questionnaire

SECTION 1

Questions	Responses
How long have you been working in the telecom industry?	1. Less than 1 year 2. 2 – 5 years 3. 6 – 9 years 4. 10 – 15 years 5. 16 years and above
Which age group do you belong to?	1. 18 – 25 years old 2. 26 – 35 years old 3. 36 – 45 years old 4. 46 – 60 years old 5. 61 years and above
What gender do you identify with?	1. Female 2. Male 3. A gender not listed here 4. Non-binary/non-conforming 5. Prefer not to respond
What is your educational background?	1. Matric 2. Intermediate 3. Bachelor 4. Masters 5. MPhil/PhD

SECTION 2

Key Aspect: Strategic Alignment

This section aims to collect your feedback on the identification of core digital transformation themes for the South African ICT telecoms industry.

Your opinion is required. Please indicate your level of agreement or disagreement with the below questions and statement.

The 5-point Likert scale consists of the below points – (1) Strongly Disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly Agree.

Questions	Responses
1. The South African ICT Telecoms industry is actively embracing digital transformation initiatives.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
2. The South African ICT Telecoms industry recognizes the importance of digital innovation for sustainable growth.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
3. The South African ICT Telecoms industry is effectively integrating digital technologies into its operations.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
4. The South African ICT Telecoms industry demonstrates a clear strategy for digital transformation implementation.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
5. The South African ICT Telecoms industry invests significantly in developing digital capabilities and skills.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
6. The South African ICT Telecoms industry prioritizes customer-centric digital solutions and services.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

Key Aspect: Resource Constraints

This section aims to collect your feedback on the identification of barriers to digital transformation in the South African ICT telecoms industry.

Your opinion is required. Please indicate your level of agreement or disagreement with the below questions and statement.

The 5-point Likert scale consists of the below points – (1) Strongly Disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly Agree.

Questions	Responses
1. There is a lack of awareness and understanding of the benefits of digital transformation within the South African ICT Telecoms industry.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
2. The South African ICT Telecoms industry struggles to secure sufficient financial resources for digital transformation projects.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
3. The existing regulatory environment poses obstacles to digital transformation in the South African ICT Telecoms industry.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
4. The South African ICT Telecoms industry faces difficulties in acquiring and retaining digital talent.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
5. Legacy systems and infrastructure hinder the progress of digital transformation in the South African ICT Telecoms industry.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
6. The South African ICT Telecoms industry encounters resistance to change and a lack of digital transformation culture.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

Key Aspect: Integration of Innovative Technologies

This section aims to collect your thoughts on how digital transformation can improve the competitiveness of the South African ICT telecoms industry.

Your opinion is required. Please indicate your level of agreement or disagreement with the below questions and statement.

The 5-point Likert scale consists of the below points – (1) Strongly Disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly Agree.

Questions	Responses
1. The adoption of digital technologies can enhance the operational efficiency of the South African ICT Telecoms industry, leading to increased competitiveness.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
2. Digital transformation enables the South African ICT Telecoms industry to deliver innovative products and services, giving it a competitive edge.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
3. The South African ICT Telecoms industry's investment in digital transformation positively impacts its ability to attract and retain customers.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
4. Digital transformation initiatives can differentiate the South African ICT Telecoms industry from its competitors in terms of customer experience and service quality.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
5. The South African ICT Telecoms industry's embrace of digital transformation enhances its agility and responsiveness to market changes, boosting competitiveness.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree
6. Digital transformation empowers the South African ICT Telecoms industry to explore new business models and revenue streams, strengthening its competitive position.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

APPENDIX B: Participation Information Sheet



Date 30 April 2024

UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG

Dear Participant,

My name is Nompumelelo Mnguni. I am a Master's in Business Administration student at Wits Business School at the University of the Witwatersrand, Johannesburg. My supervisor is Dr. Christoph Maier. I am conducting a research study about Digital Transformation. The study's title is the impact of digital transformation in the South African ICT telecoms industry.

I am inviting you to take part in a questionnaire. The questionnaire's purpose is to assess digital transformation in the South African ICT telecoms industry by identifying key themes, barriers, and improvements required.

ICT employees in the Telecommunication Sector residing in South Africa are invited to participate in this survey. The questionnaire consists of 18 questions and the duration of the survey will not be more than 10 minutes. This study will require 100 participants to take part in this interview.

Your involvement in this study is entirely voluntary, and you may choose to discontinue your participation at any point by simply closing the survey window or tab. Your identity will remain anonymous, with no personal identifiers or data collected beyond your demographic details.

If you have any questions during or afterward about this research, please get in touch with me at the details listed below. This study will be written up as a research report available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you (optional). The data collected from this research project will be stored in a password-protected computer and kept for five years. With your permission, the data collected from this research project may be used by other researchers in an anonymized format.

If you have any questions during or afterward about this research study, feel free to contact me or my supervisor at the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za.

Yours sincerely,
Nompumelelo Mnguni

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Supervisor:

Dr. Christoph Maier, Email christoph.maier@wits.ac.za, Tel. +27 82 467 5096

APPENDIX C: Consent Form



Title of project: The impact of digital transformation in the South African ICT telecoms industry

Name of researcher: Nompumelelo Mnguni

I,, agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below)

The research study was explained to me. I understand what this study is about. YES NO

I understand that I can volunteer to take part in the study YES NO

I agree that the interview/focus group/other activity may be audio recorded YES NO

I agree that direct quotations from my interview/focus group/other YES NO

activity may be used by the researcher in their research report/
manuscript/book chapter

I agree that my participation will remain anonymous (my name or other YES NO

identifying data will not be used by the researcher in their research
report/manuscript/book chapter)

I agree that other researchers may use the information I provide in my interview/focus group/other activity (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on

YES NO

..... (signature)

..... (name of participant)

..... (date)

..... (signature)

..... (name of researcher/person seeking consent)

..... (date)