



**Investigating the Challenges and Opportunities of Implementing Digital
Transformation in the South African Public Sector**

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**A dissertation submitted in partial fulfilment of the requirements for the degree of
Master of Business Administration (MBA)**

Graduate School of Business & Leadership

College of Law and Management Studies


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2023

DECLARATION - PLAGIARISM

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ACKNOWLEDGEMENTS

As I sit to pen down these acknowledgments, it is with a profound sense of gratitude and a heart full of appreciation. First and foremost, I must extend the deepest thanks to myself. It was through my own relentless determination, countless hours of hard work, and an unwavering commitment to my goals that this dissertation came to fruition. This journey has been a testament to my resilience and dedication, a path that I have navigated with persistence and passion.

To my incredible children, Esihlisipho and Nomonde, your bright smiles and unconditional love have been the light through my darkest hours of study. You have been my inspiration and motivation, reminding me of the importance of our future and the role my work plays in shaping it. Your understanding and support, despite the many times I was absorbed in my work, mean the world to me. You are the reason I aspire to set an example of perseverance and the pursuit of knowledge.

To my better half, your unwavering support and boundless patience have been my stronghold. You have been a confidante, a partner, and a pillar of strength throughout this journey. Your belief in my abilities, even when I doubted myself, has been a source of comfort and encouragement. Your sacrifices have not gone unnoticed, and your love has been a constant in the midst of this academic whirlwind.

I would also like to express my gratitude to my supervisor and colleagues at the university, whose guidance and insights have been invaluable. Lastly, I extend my appreciation to everyone who has been a part of this journey, in ways big and small. Your roles in this process have been instrumental in reaching this significant milestone.

ABSTRACT

In the dynamic arena of digital evolution, South Africa's public sector faces significant challenges in digital transformation. These include insufficient technological infrastructure, gaps in digital literacy, complex policy and regulatory frameworks, and the need to ensure data security and inclusivity. This study examines these barriers and explores the opportunities digital transformation presents for improving service delivery, operational efficiency, and citizen engagement.

Utilizing a qualitative research methodology with a phenomenological approach, the investigation sheds light on specific impediments that thwart the realization of digital transformation's potential benefits. The research involved a sample size of 16 respondents, drawn from various roles within the Gauteng Department of e-Government. It further evaluates the expansive impact of digital transformation on the public sector's capacity to tackle systemic challenges, stimulate economic advancement, and promote sustainable development objectives. Insights garnered from this study illustrate how Gauteng's public sector, extending to the broader South African context, can exploit digital technologies to ameliorate citizen services.

The research pinpointed critical obstacles, including technological underdevelopment, a deficit in digital competencies among public employees, and the rigidity of policy and regulatory frameworks. Nonetheless, it also spotlighted digital transformation's capacity to revolutionize public service delivery, operational efficiency, and citizen interaction. The main results indicated that despite these challenges, digital transformation has the potential to significantly enhance public service delivery, operational efficiency, and citizen engagement.

Drawing from these insights, the study proposes actionable recommendations for policymakers and governmental stakeholders. These encompass formulating comprehensive strategies and policies to navigate and surmount digital transformation challenges while capitalizing on its advantages. Recommendations include fortifying technological infrastructure, amplifying digital literacy among public service workers, and refining policy and regulatory frameworks to enable innovation and digital engagement.

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CHAPTER 1:INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction to Digital Transformation in the Public Sector

Digital transformation is a global phenomenon disrupting traditional systems and transforming organizational operations (Dwivedi, Hughes, Coombs, Constantiou, Duan, Edwards, Gupta, Lal, Misra, & Prashant, 2020). While both private and public sectors experience this shift, the public sector faces unique challenges, making digital transformation complex. In South Africa, the public sector recognizes the potential of digital transformation to enhance service delivery, citizen engagement, and operational efficiency(Mutula & Mostert, 2010). The Department of e-Government in Gauteng province leads this push towards digitization. However, implementation challenges such as infrastructure limitations, digital literacy gaps, privacy and security concerns, and strict policy and regulatory frameworks hinder progress (Alvarenga, Matos, Godina, & CO Matias, 2020; Cardullo, Di Felicianantonio, & Kitchin, 2019).

Bannister and Connolly (2014) and Mergel, Edelman and Haug (2019) have explored various aspects of digital transformation in the public sector. However, there is a gap in understanding the specific challenges and opportunities in the South African context, particularly in Gauteng province. This research addresses this gap by investigating the challenges faced by the South African public sector in implementing digital transformation initiatives and exploring the opportunities these initiatives present.

1.2 Background Of Study

The fourth industrial revolution, marked by rapid advancements in digital technology, has transformed the global socio-economic landscape, making digital transformation essential for organizations (Schwab, 2016). Digital transformation involves integrating digital technology to fundamentally alter organizational operations and value delivery (Manda & Backhouse, 2018).

In the public sector, this transformation is recognized as crucial for revolutionizing service delivery, enhancing operational efficiency, and improving citizen engagement. However, the journey is fraught with unique challenges, especially in the public sector, where complexities differ from the private sector (Dwivedi et al., 2020).

Despite progress in digital adoption, the South African public sector faces issues such as inadequate infrastructure, limited digital literacy, privacy and security concerns, and complex policy frameworks. These challenges are particularly evident in Gauteng province, where the Department of e-Government aims to modernize public service delivery through Information and Communication Technology (ICT) (Gauteng Department of e-Government, 2021).

This study examines the challenges and opportunities of digital transformation in the South African public sector, providing insights that could inform strategies for successful digital transformation in similar settings.

1.3 The Research Problem

Digital transformation offers significant potential for revolutionizing public sector services in South Africa, particularly in Gauteng province. However, substantial implementation challenges remain. According to (Asogwa, 2013) the Gauteng Department of e-Government has not yet fully harnessed the benefits of digitization, such as enhanced service delivery, increased efficiency, and improved citizen engagement. Key impediments include infrastructure inadequacies, digital literacy gaps, privacy and security concerns, and rigid policy and regulatory environments (Manda & Backhouse, 2017).

J. Bertot, E. Estevez and T. Janowski (2016) highlight that these issues restrict the digitization of public services, exacerbate access inequalities, hinder economic development, and limit democratic participation. Addressing these challenges is crucial to prevent widening the digital divide, ensure efficient public service delivery, and align with South Africa's National Development Plan (NDP) 2030 and the United Nations' Sustainable Development Goals (SDGs) (Chigova, 2021).

This study explores the challenges and opportunities of digital transformation within the South African public sector, particularly in Gauteng, offering practical solutions to leverage its benefits and align with broader development goals.

1.4 Research Aim

The aim of this research is to investigate the current challenges and opportunities associated with digital transformation in the South African public sector. This study specifically focuses on understanding the dynamics within the Gauteng province, assessing how digital strategies

can be effectively implemented to improve public services, enhance operational efficiency, and foster citizen engagement. The research seeks to provide practical solutions and recommendations that align with South Africa's broader developmental goals and priorities.

1.5 Research Objectives and Questions

1.5.1 Research Objectives

The proposed research aims to:

- Identify key challenges in implementing digital transformation within the Gauteng province's public sector.
- Examine factors impeding digital transformation in the South African public sector, including infrastructure, digital literacy, privacy, security, and policy issues.
- Explore opportunities and benefits of digital transformation in the South African public sector, focusing on service delivery, citizen engagement, and operational efficiency.
- Assess the impact of digital transformation on addressing systemic issues and promoting economic growth and sustainable development.
- Provide recommendations for policymakers and stakeholders on effective strategies for leveraging digital transformation opportunities in the South African public sector.

1.5.2 Research Questions

The study seeks to answer:

- What challenges are faced in implementing digital transformation in the Gauteng province's public sector?
- What factors hinder successful digital transformation in the South African public sector?
- What opportunities and benefits does digital transformation offer in the South African public sector?
- How does digital transformation impact the sector's ability to address systemic issues and promote development?
- What recommendations can be made to policymakers and stakeholders for effective digital transformation in the South African public sector?

1.6 Theoretical Framework

This research will draw upon the Technology Acceptance Model (TAM) proposed by Davis (1989) and the diffusion of innovations theory by Rogers (2003). These theories provide a lens

to better understand the challenges, opportunities, and implications of digital transformation in the South African public sector.

1.6.1 Technology Acceptance Model (TAM)

The TAM proposes that the acceptance and use of a new technology are influenced by its perceived usefulness and perceived ease of use (Davis, 1989). This model has been widely used in various contexts, including the public sector Chen and Aklikokou (2020), to explain the acceptance and adoption of digital technologies. In this study, TAM provides a theoretical basis for understanding the barriers to digital transformation, including infrastructure deficiencies and digital literacy gaps, as these factors are related to perceived ease of use. Similarly, concerns about privacy and security, and the potential benefits of digital transformation, are linked to perceived usefulness. However, one of the weaknesses of TAM is that it doesn't consider the influence of external factors, such as cultural, social, and policy influences. To address this, the study will complement TAM with the diffusion of innovations theory.

1.6.2 Diffusion of Innovations Theory

Rogers' diffusion of innovations theory posits that the adoption of new ideas or technologies is influenced by factors such as relative advantage, compatibility, complexity, trialability, and observability (Rogers, Singhal, & Quinlan, 2014). The theory has been used extensively in various fields, including information systems and public administration, to understand the diffusion and adoption of innovations (Abdullahi, 2016). This theory can help explore the factors affecting the implementation of digital transformation in the South African public sector, including the role of policy and regulatory frameworks compatibility, and the impact of digital transformation on service delivery and citizen engagement as a relative advantage. However, Rogers' theory primarily focuses on individual adoption and may overlook organizational and systemic factors, which is why it's essential to use it in conjunction with the TAM.

1.7 Literature Review

Digital transformation has become a critical factor for organizations worldwide, as it leads to the adoption of new technologies and innovative business models. The South African public sector is no exception in this regard, with the government actively promoting digitalization initiatives. However, there are several challenges and opportunities associated with implementing digital transformation in this context. This literature review aims to explore these

aspects by discussing key studies related to digital transformation in the South African public sector.

1.7.1 Definition of Digital Transformation in the Public Sector

Digital transformation refers to the comprehensive and strategic integration of digital technologies, processes, and capabilities into an organization's operations, services, and culture (Mergel, I., Edelmann, N. & Haug, N., 2019). It involves leveraging advancements in technology to fundamentally reshape how an organization operates, delivers services, and interacts with its stakeholders. In the context of the public sector, digital transformation entails the adoption and integration of digital technologies and practices within government institutions, agencies, and departments (Weerakkody, Janssen, & El-Haddadeh, 2021). According to Bannister and Connolly (2014) it aims to enhance the efficiency, effectiveness, and responsiveness of public services, while also fostering citizen engagement, transparency, and accountability.

Digital transformation in the public sector encompasses a wide range of initiatives, including the digitization of administrative processes, the development of e-government services, the use of data analytics for evidence-based decision-making, and the implementation of smart city solutions, among others (Apleni & Smuts, 2020). These initiatives aim to leverage technology to improve service delivery, streamline operations, and enable more citizen-centric governance. The public sector's adoption of digital transformation is driven by several factors, including the increasing expectations of citizens for convenient and accessible services, the need to optimize resource allocation and operational efficiency, and the potential for innovation and economic growth through digital technologies (Apleni & Smuts, 2020).

1.7.2 Challenges to Digital Transformation in the Public Sector

One of the primary challenges faced by the public sector in South Africa is the lack of adequate infrastructure required for successful digital transformation (Sigwejo & Pather, 2016). In their study on e-government readiness, they highlight that many government institutions face difficulties in providing consistent internet access due to poor connectivity and outdated equipment. Additionally, there is a general shortage of skilled IT professionals within these institutions, which further hinders their ability to adopt advanced technological solutions (Kanyemba & Hofisi, 2019).

Another significant challenge identified by scholars is the resistance to change among employees within the public sector (Apleni & Smuts, 2020). According to Apleni and Smuts (2020), Nzimakwe (2021) many workers view such changes as threats to job security or increased workload. Furthermore, inadequate training and support systems contribute to this resistance as employees struggle to adapt to new processes and tools. As a result, addressing organizational culture barriers becomes crucial for ensuring successful implementation of digital transformation strategies within public institutions.

1.7.3 Digital Transformation Opportunities for the Public Sector

Despite these challenges, recent research has highlighted numerous opportunities for leveraging digital technology advancements in the South African public sector. For instance, one major area of potential growth lies in improving service delivery through e-government initiatives (Manda & Ben Dhaou, 2019). By adopting electronic platforms for citizen engagement and inter-agency collaboration, government institutions can streamline processes and enhance efficiency, ultimately resulting in better service provision for the public.

Another promising area of opportunity exists in leveraging digital technologies to address social and economic issues faced by South Africa. As noted by Manda and Backhouse (2018) digital transformation can help promote financial inclusion through initiatives such as digitizing social grant payments or tax collection systems. Similarly, adopting innovative solutions like e-health platforms can improve access to healthcare services in rural areas, thereby reducing health disparities within the country (De Vera, Challa, Liu, Fuller, Feroz, Gamble, Leung, & Seto, 2022).

1.7.4 Strategies for Successful Implementation of Digital Transformation

To capitalize on these opportunities, researchers have proposed several strategies for successful implementation of digital transformation within the South African public sector. Among them, investing in infrastructure development is a recurring theme throughout the literature (Alvarenga, A., Matos, F., Godina, R. & Co Matias, J., 2020). By upgrading internet connectivity and hardware resources, government institutions can create a solid foundation upon which advanced digital solutions can be deployed.

Moreover, capacity building is another critical factor identified by scholars as essential for driving digital transformation success (Manda & Ben Dhaou, 2019). This includes providing

adequate training programs for employees at all levels of the organization to ensure they possess the necessary skills to navigate new technologies effectively. Additionally, fostering a culture that embraces change and innovation is crucial for overcoming resistance and promoting widespread adoption of new systems and processes (Manda & Ben Dhaou, 2019).

1.8 Research Methodology

This study employs a qualitative design with a phenomenological approach, suitable for delving into the lived experiences of those involved in digital transformation within South Africa's public sector (Creswell & Poth, 2018). This approach seeks to understand the essence of experiences, offering in-depth insights into the perceptions, challenges, and opportunities faced by stakeholders.

Data will be collected through semi-structured in-depth interviews and document analysis, with the former allowing for a deep exploration of participant experiences and perceptions (Creswell & Poth, 2018), and the latter providing contextual understanding and aiding in data triangulation (Armstrong, 2020).

Purposive sampling is utilized, targeting individuals with direct experience or knowledge about digital transformation in the South African public sector (Pandey & Pandey, 2021). The study focuses on Gauteng province and includes policymakers, government officials, IT professionals, and citizens engaged in digital transformation. Participants are selected based on their involvement in or impact from digital transformation, with sample size determined by data saturation.

The data analysis for this study is meticulously carried out through manual thematic analysis, adhering to the principles outlined by (Miles, Huberman, & Saldaña, 2020). This rigorous process entails an initial comprehensive reading of the data, systematic coding, the careful crafting of themes, and their thorough review and refinement. The study not only categorizes and interprets the data but also to contextualize the findings within the broader scope of digital transformation in South Africa's public sector. By ensuring credibility, transferability, dependability, and confirmability, the study endeavours to provide a profound and reliable understanding of the stakeholders' experiences, challenges, and opportunities in the face of digital transformation.

1.9 Significance Of the Study

This study holds considerable significance, both theoretically and practically, for multiple stakeholders involved in digital transformation within the South African public sector. This research contributes to the existing body of knowledge on digital transformation within the public sector, particularly within developing countries. It aims to bridge the gap in literature concerning the challenges and opportunities of digital transformation in the South African public sector. The findings from this research can inform and influence the formulation and implementation of policies related to digital transformation in the public sector. It provides policymakers with insights about the factors hindering digital transformation and practical recommendations on how these challenges can be addressed. The study carries significant potential to shape the future of digital transformation in the public sector, aiding stakeholders in making informed decisions to enhance service delivery and promote socio-economic development.

1.10 Structure Of the Research

This research follows a structured approach to examine digital transformation in South Africa's public sector, with a focus on Gauteng's Department of e-Government. It guides the reader from introductory concepts to in-depth analysis and conclusions.

Chapter 1: Introduction - Introduces the topic, sets the research context, outlines the problem statement, objectives, questions, and study significance. Concludes with a layout overview.

Chapter 2: Literature Review - Reviews existing research, explores theoretical frameworks, and analyses relevant case studies, with a focus on South Africa.

Chapter 3: Methodology - Details the research design, methodology, data collection, analysis strategies, sampling technique, participant selection, ethical considerations, and limitations.

Chapter 4: Data Analysis and Findings - Presents and analyses interview and document analysis findings, linking them to research objectives and questions.

Chapter 5: Discussion - Discusses findings in relation to the literature, interpreting the data and its implications for policy and practice.

Chapter 6: Conclusions and Recommendations - Summarizes key findings, offers recommendations, suggests future research directions, and acknowledges limitations.

1.11 Chapter Summary

This chapter introduced digital transformation in South Africa's public sector, emphasizing its potential and challenges, especially in Gauteng's Department of e-Government. It outlines the background, including the global shift towards digitalization in the public sector and specific challenges in the South African context. The research problem addresses the gaps in digital transformation in Gauteng, focusing on infrastructure, literacy, privacy, and policy challenges. The aim and objectives clarify the study's focus on exploring these challenges and opportunities. The methodology section describes the qualitative, phenomenological approach and data collection methods. Finally, the chapter highlights the study's significance in informing digital transformation policies and its structured approach across various chapters.

CHAPTER 2:LITERATURE REVIEW

This chapter presents a comprehensive analysis of digital transformation in the public sector, with a focus on South Africa. It aims to identify the gaps and limitations in existing research, offering insights into areas that require further investigation. The literature review also serves as a platform for synthesizing and evaluating existing knowledge, enabling a deeper understanding of the conceptual framework, stages, models, driving forces, challenges, and global case studies of digital transformation in the public sector. The ultimate goal is to contribute to the existing body of knowledge and provide valuable insights for practitioners, policymakers, and researchers in the field.

2.1 Introduction to the Literature Review

Digital Transformation in the public sector emerges as a pivotal area of inquiry, especially within the developmental landscapes of countries like South Africa. The concept is multifaceted, characterized by diverse definitions that collectively underscore its complexity. Recent studies emphasize the integration of technologies like the Internet of Things (IoT) and Artificial Intelligence (AI), which are reshaping the foundations of public sector operations and service delivery mechanisms (Gil-Garcia, Pardo, & Gasco-Hernandez, 2020). According to Velsberg, Westergren and Jonsson (2020) digital transformation represents a comprehensive adoption of digital technologies that revolutionizes not only technological applications but also strategic and structural aspects of public administration. Mergel et al. (2019) broadens this perspective, viewing it not just as a technological shift, but also as a strategic and cultural metamorphosis within government bodies. Weerakkody et al. (2021) focus on its capacity to leverage digital technologies and capabilities towards establishing a robust, responsive, and citizen-centric public administration. This spectrum of interpretations highlights digital transformation as an encompassing phenomenon that integrates technology adoption, process innovation, data utilization, and organizational restructuring. This literature review, therefore, aims to dissect and synthesize these varied perspectives, offering a nuanced understanding of digital transformation's role in redefining public sector dynamics, particularly examining its implications and applications in the South African context.

2.2 Conceptual Framework of Digital Transformation

Understanding Digital Transformation in the public sector requires a multi-dimensional and in-depth conceptual framework. As Verina and Titko (2019) assert, digital transformation is an intricate process that entails the comprehensive integration of digital technologies into every

facet of an organization. This transformation extends far beyond the basic adoption of new technologies; it demands a profound and holistic overhaul of all functions within the public sector (Weerakkody et al., 2021). According to Gil-Garcia et al. (2020) the inclusion of Internet of Things (IoT) and Artificial Intelligence (AI) technologies can significantly enhance operational efficiencies and responsiveness to citizen needs, emphasizing the strategic, cultural, and operational shifts required to harness these technologies effectively.

Central to this transformation is the use of digital tools and platforms which enable governments and public sector entities to revolutionize their service delivery methodologies (Nzimakwe, 2021). This revolution is not just about efficiency improvements but also involves reimagining the ways in which services are conceived and delivered. The scope of digital transformation in the public sector is extensive, touching upon crucial areas such as citizen engagement, data governance, service design, and the enhancement of decision-making processes (Alvarenga et al., 2020). Velsberg et al. (2020) highlight how these technologies are redefining organizational roles, requiring a redefinition of roles and responsibilities to effectively utilize digital tools for public benefit.

The ultimate goal of digital transformation in this context is to empower both citizens and government employees. According to Pittaway and Montazemi (2020) this empowerment is achieved through the development and implementation of digital solutions that are not only user-friendly and intuitive but also exceptionally efficient. These solutions aim to significantly improve the quality and accessibility of public services, elevating the public service experience to new heights. The vision is to create a public sector that is more responsive, transparent, and effective, leveraging the potential of digital technologies to meet the evolving needs of society and foster a more engaged and satisfied citizenry.

2.2.1 Core Components of the Framework

The conceptual framework for digital transformation in the public sector encompasses several critical components that are fundamental to integrating digital technologies effectively within governmental functions. These components form the backbone of successful transformation initiatives and include strategic alignment, technological infrastructure, data utilization, workforce capability, policy and governance, and public-private partnerships.

2.2.1.1 Strategic Planning

According to Kitsios, Kamariotou and Mavromatis (2023) strategic alignment is foundational to ensuring that digital transformation efforts support and advance the primary objectives of the organization. This involves aligning IT strategies with business strategies to improve service delivery and operational efficiencies. Strategic alignment is crucial for maximizing the impact of investments in digital technologies, as it ensures that all digital initiatives are directly contributing to the organization's goals (Kitsios et al., 2023). Additionally, strategic alignment facilitates better resource allocation, setting clear priorities for technology implementations that support critical areas of public service.

2.2.1.2 Technology Infrastructure

Technological infrastructure serves as the backbone of digital transformation. This includes not only the physical hardware and network capabilities but also the software and platforms that enable the deployment of digital services (Kitsios et al., 2023). According to Gil-Garcia et al. (2020) the integration of IoT technologies, for instance, can significantly enhance the ability of public sector organizations to gather and analyse data in real time, leading to more informed decision-making and improved public services. A well-designed infrastructure supports scalability and flexibility, allowing public sector organizations to adapt to new technologies and service demands efficiently.

2.2.1.3 Data and Analytics

Data and analytics are pivotal in enabling evidence-based decision-making. According to Kattel and Takala (2021) data utilization involves leveraging large volumes of data to drive decision-making and service improvement. Big data analytics are increasingly employed to analyse trends, predict outcomes, and tailor services to meet the specific needs of citizens. This analytical approach helps in transforming raw data into actionable insights, which can significantly enhance operational effectiveness and citizen satisfaction (Kattel & Takala, 2021). Effective data utilization also requires robust data governance practices to ensure data integrity, security, and compliance with privacy regulations.

2.2.1.4 Organizational Culture and Workforce Skills

Workforce capability focuses on equipping employees with the necessary skills and knowledge to manage and utilize new digital tools. As digital technologies evolve, continuous learning and development are essential for keeping the public sector workforce abreast of the latest technologies and processes (Kitsios et al., 2023). Nzimakwe (2021) posits that the readiness

and adaptability of an organization's culture and its workforce are critical in embracing digital transformation. This involves nurturing a digital mindset, upskilling employees, and fostering an environment conducive to innovation and change. The success of digital initiatives heavily relies on the skills and attitudes of the workforce, who are the primary implementers and users of these technologies. This not only involves formal training programs but also fostering a culture of innovation and continuous improvement within the organization (Kitsios et al., 2023).

2.2.1.5 Effective Governance and Stakeholder Engagement

Manda (2022) asserts that effective governance and stakeholder engagement are key to the successful implementation and ongoing monitoring of digital initiatives. This component ensures clear leadership, accountability, and collaborative efforts among various stakeholders (Chantillon, 2021). It involves engaging citizens, employees, and other stakeholders in the digital transformation process, ensuring that initiatives are responsive to the needs of all involved parties.

Additionally, Public-private partnerships (PPPs) are crucial for leveraging external expertise and resources for digital transformation projects (Kitsios et al., 2023). These stakeholders can provide access to state-of-the-art technology and industry best practices, which might be out of reach for public sector organizations due to resource constraints. PPPs also allow for risk sharing and can drive innovation through collaborative approaches to complex problems (Kitsios et al., 2023).

2.2.2 Key Drivers of Digital Transformation in the Public Sector

In the context of digital transformation within the public sector, the work of Ahn and Chen (2022) highlights four primary drivers that significantly shape this progression. These key drivers include (i) government policies, which provide the regulatory framework and strategic direction; (ii) technological advancements, which offer new tools and capabilities; (iii) citizens' expectations, reflecting the evolving demands and preferences of the public; and the (iv) availability of funding, which is critical for supporting and implementing transformation initiatives. The ensuing discussion will delve into each of these drivers in detail, examining their roles and impacts on the digital transformation journey in the public sector.

2.2.2.1 Governmental Policies

Governmental policies are a pivotal driver of digital transformation. Policies provide the strategic direction and framework necessary for effective implementation and alignment of stakeholders. Verina and Titko (2019) discuss the relationship between effective digital program governance and program success, highlighting the importance of coherent and supportive policies in driving transformation efforts. Similarly, Meyerhoff Nielsen and Jordanoski (2020) examine digital transformation governance and coordination models, emphasizing the role of policy in shaping the trajectory of digital initiatives.

2.2.2.2 Technological Advancements

Technological advancements serve as catalysts, introducing innovative solutions for public services enhancement. Pittaway and Montazemi (2020) explored the role of organizational capacity in fostering digital transformation in local governments, emphasizing the need to embrace new technologies for improved efficiency and service delivery. Lindgren, Toll and Melin (2021) delve into the impact of automation as a driver of digital transformation in local government, highlighting how technological advancements can streamline operations and enhance public services.

2.2.2.3 Citizen Expectations

According to Mergel et al. (2019) citizen expectations significantly influence the direction and pace of digital transformation. The demand for digital services that are seamless and user-friendly mirrors the high standards set by private sector experiences. This calls for public sector entities to innovate and deliver services that meet these evolving needs, focusing on accessibility and interaction. Van Veldhoven and Vanthienen (2022) discuss digital transformation as an interaction-driven perspective between business, society, and technology, reflecting the importance of aligning public services with citizen expectations.

2.2.2.4 Available Funding

Funding is critical for enabling digital transformation, providing the necessary resources for technology infrastructure, digital solutions, and workforce development (Elsafty & Yehia, 2023). Feroz, Zo and Chiravuri (2021) examined digital transformation and environmental sustainability, putting forward the argument that financial investments in digital initiatives are essential for modernizing operations and achieving sustainable outcomes. The availability of funding supports the comprehensive adoption and acceptance of digital technologies within public sector organizations.

These key drivers being are instrumental in shaping the landscape of digital transformation in the public sector. By effectively addressing and leveraging these drivers, public sector organizations can navigate the challenges and opportunities of digital transformation, leading to improved service delivery, governance, and enhanced societal outcomes.

2.3 Stages and Models of Digital Transformation Implementation

The exploration of various stages and models of digital transformation offers critical insights into the methodologies and strategic approaches employed in the digital transformation of public services and administration. This section not only highlights the procedural steps involved in such transformations but also emphasizes the models that have proven effective in guiding public sector organizations through these significant changes. Understanding these models and stages is essential for grasping the complexities and challenges faced during the digital transformation in the public sector, and how these are navigated to achieve enhanced efficiency, transparency, and service delivery.

2.3.1 Stages of Digital Transformation

The digital transformation journey in the public sector can be comprehensively understood through the four-stage model delineated by the United Nations and further explored by scholars such as (Bertot, J., Estevez, E. & Janowski, T. (2016a); United Nations, 2022). This model, comprising the Emergent, Enhanced, Transactional, and Connected stages, provides a framework for analysing the progression of digital initiatives in public administration. In the context of South Africa, this model offers valuable insights into the unique challenges and opportunities faced during the implementation of digital transformation in the public sector.

2.3.1.1 Emergent Stage

The Emergent Stage in the digital transformation framework refers to the initial phase where government entities begin establishing their digital presence (United Nations, 2022). This stage is pivotal in setting the foundational infrastructure for digital governance, primarily focusing on the dissemination of information via digital channels. It represents the government's first step in transitioning from traditional, paper-based methods to more modern, digital forms of communication and information sharing.

The Emergent Stage is the phase where government agencies start to establish a digital platform to disseminate information to a highly diverse population, characterized by varying levels of

digital literacy and access. The challenge in this context lies in creating digital platforms that are not only informative but also inclusive and accessible to all segments of the population. This inclusivity is crucial, especially considering the geographical and socio-economic disparities within the country. According to J. Bertot et al. (2016) the effectiveness of this stage in developing countries like South Africa is gauged by how well these digital platforms bridge the informational divide, ensuring that citizens, regardless of their location or background, have access to essential government information. This first step is vital in building trust and laying the groundwork for more advanced stages of digital transformation in the public sector.

2.3.1.2 Enhanced Stage

Accordingly, the Enhanced Stage in the digital transformation model represents an evolution from the foundational Emergent Stage, marked by the introduction of interactive digital services (Hujran, Alarabiat, Al-Adwan, & Al-Debei, 2023a). This stage is characterized by an increase in two-way communication between government and citizens, where government websites and digital platforms begin to offer more than just static information. According to Daub, Domeyer, Lamaa and Renz (2020) features such as downloadable forms, multimedia content, and initial steps towards interactive services are introduced, enhancing the user experience and engagement.

The Enhanced Stage plays a critical role in elevating the level of digital engagement between the government and its citizens (Zhang & Kimathi, 2022). This stage involves a significant shift from merely providing information to facilitating interactive digital experiences. The South African context presents unique challenges in this stage, primarily due to the diverse needs of its population and varying levels of digital infrastructure across different regions. The government faces the task of not only developing these enhanced digital services but also ensuring their accessibility to all citizens, including those in remote, rural, and underprivileged areas. The success of the Enhanced Stage in developing countries hinges on balancing the enhancement of digital services with the widespread availability and accessibility of these services, ensuring that no citizen is left behind in the digital transformation journey (Luna-Reyes, Juiz, Gutierrez-Martinez, & Duhamel, 2020). This stage sets the foundation for more complex digital interactions and paves the way for the subsequent, more sophisticated stages of digital transformation in the public sector.

2.3.1.3 Transactional Stage

The Transactional Stage is a critical phase in the digital transformation model, where the interaction between government and citizens evolves into active and dynamic exchanges (Zhang & Kimathi, 2022). According to (J. C. Bertot, E. Estevez, & T. Janowski, 2016) this stage signifies a move beyond informational and basic interactive services to the facilitation of actual online transactions. It is characterized by the capability of government digital platforms to process various citizen requests and transactions, such as online applications for licenses, permits, tax filings, and other similar services (Luna-Reyes et al., 2020; Wirtz, Langer, & Schmidt, 2021). The essence of this stage lies in enabling citizens to complete significant government-related tasks digitally, thereby enhancing the efficiency and convenience of public service delivery.

The Transactional Stage represents a substantial leap forward in digital governance. This phase brings about opportunities to streamline government operations and improve public service delivery. According to Danielle and Masilela (2020) for a country like South Africa, with its unique challenges of bureaucracy and service delivery, this stage offers a pathway to enhance transparency, reduce corruption, and increase the efficiency of government processes. However, it also poses significant challenges, particularly in the realms of developing robust technological infrastructure and ensuring the security and privacy of online transactions.

The implementation of transactional capabilities in South Africa necessitates careful consideration of the country's diverse demographic and geographic landscape. Ensuring that these digital transactional services are accessible and user-friendly for all citizens, including those in rural or less developed regions, is crucial. Additionally, the government must focus on building trust among citizens, ensuring that their data is secure and that the digital platforms are reliable and easy to use. Thus, the Transactional Stage in South Africa is not only about the adoption of technology but also about fostering a culture of digital literacy and trust in digital services. Successfully navigating this stage is key to unlocking the full potential of digital transformation in the public sector, setting the stage for a more integrated and sophisticated digital government in the subsequent Connected Stage.

2.3.1.4 Connected Stage

The Connected Stage represents the pinnacle of the digital transformation journey in the public sector, where the focus shifts to the integration and interconnection of various digital

government services (Hujran, Alarabiat, & AlSuwaidi, 2023b). This advanced stage is characterized by seamless, cross-agency e-services, where different government departments and entities collaborate and share information through digital platforms. The goal is to provide a cohesive and comprehensive digital experience to citizens, enabling them to access a wide range of government services through a single, integrated platform.

According to Zhang and Kimathi (2022) the Connected Stage is particularly significant, given the country's diverse and complex socio-political landscape. This stage presents an opportunity to overcome the traditional silos within government agencies and promote a more collaborative and efficient approach to public service delivery. By integrating services across various departments, the government can provide more streamlined and user-centric services, enhancing the overall quality and accessibility of public services (J. Bertot et al., 2016). However, achieving this level of integration in South Africa comes with its own set of challenges. These include ensuring interoperability between different government systems, safeguarding data privacy and security in a highly interconnected environment and managing the change in organizational culture required for such collaboration. Moreover, there is a need to ensure that these integrated services are equally accessible to all citizens, including those in remote and underprivileged areas, to avoid exacerbating the existing digital divide.

The Connected Stage in South Africa also demands a high level of technical expertise and robust infrastructure (Hujran et al., 2023b). It requires strategic planning and investment in technology that can support the complex needs of integrated service delivery. Additionally, fostering a culture of innovation and adaptability within government institutions is crucial to keep pace with the rapidly evolving digital landscape (Guenduez & Mergel, 2022; Kitsios et al., 2023). Successfully navigating the Connected Stage can significantly enhance the efficiency and effectiveness of the South African public sector. It paves the way for a more responsive, transparent, and citizen-centric government, ultimately contributing to the overall goal of improved governance and better service delivery to the citizens of South Africa.

The application of the four-stage model in South Africa highlights the need to contextualize digital transformation strategies to the nation's unique socio-economic and infrastructural realities. Opportunities such as improved service delivery, enhanced government transparency, and increased citizen engagement must be balanced against challenges like bridging the digital

divide, ensuring cybersecurity, and managing infrastructural disparities (Villao, Vera, Duque, & Mazón, 2023). Moreover, the transformation process in South Africa must navigate bureaucratic complexities and potential resistance within the public sector (Guenduez & Mergel, 2022; Luna-Reyes et al., 2020). While the four-stage model provides a structured approach to understanding digital transformation, its implementation in the South African public sector requires a nuanced approach that considers local needs and challenges. The successful digital transformation in South Africa hinges on the equitable distribution of digital governance benefits across its diverse population, ensuring that all citizens, regardless of their socio-economic background, can access and benefit from digital public services.

2.3.2 Models of Digital Transformation Implementation

The implementation of digital transformation in the public sector is a multifaceted endeavour, necessitating systematic approaches for effective navigation and management of complexities inherent in such initiatives. Models of digital transformation provide systematic approaches to assist businesses in successfully navigating the complexities of digital transformation initiatives. These models offer frameworks and methodologies, increasing the likelihood of achieving desired outcomes and realizing the full potential of digital transformation.

2.3.2.1 McKinsey 7S Model

The McKinsey 7S Model, as elucidated by Demir and Kocaoglu (2019) offers a comprehensive framework focusing on seven internal elements: strategy, structure, systems, shared values, skills, style, and staff. This model emphasizes the interconnectedness of these elements and their alignment for effective organizational transformation. In the public sector, this framework assists in ensuring that all operations, including digital initiatives, are in congruence with the overarching organizational goals, thereby facilitating smoother transitions.

2.3.2.2 Kotter's 8-Step Change Model

Kotter's 8-Step Change Model offers a sequential approach for digital transformation implementation (Kotter, 1996). This model outlines stages including creating urgency, forming coalitions, developing strategy and vision, communicating the vision, empowering employees, generating wins, consolidating gains, and anchoring new approaches in culture. By following this model, organizations can plan and execute digital transformation initiatives effectively, building commitment among stakeholders for sustainable change. In public sector digital transformation, this model aids in systematically planning and executing initiatives, fostering

stakeholder commitment, and embedding new digital strategies into the organizational culture (Trawick & Carraher, 2023).

2.3.2.3 Prosci ADKAR Model

The Prosci ADKAR Model is a goal-oriented framework focusing on individual change, crucial for digital transformation success (Bullock, 2022). The model outlines five elements namely, Awareness, Desire, Knowledge, Ability, and Reinforcement that individuals must experience during change. This approach, emphasizes individual change management as essential for overall transformation, recognizing that organizational change is driven by the collective changes of its employees. It underscores the importance of managing individual change for overall organizational transformation, recognizing that successful digital transformation in the public sector hinges on the collective adaptation of its employees (Al-Alawi, Abdulmohsen, Al-Malki, & Mehrotra, 2019).

2.3.2.4 Lewin's Change Management Model

Lewin's Change Management Model, or the unfreeze-change-refreeze model, provides a three-stage approach to digital transformation (Hennig, 2024). It involves unfreezing the current state, implementing the desired change, and refreezing the new state to ensure sustainability. This model, as suggested by Bellantuono, N., Nuzzi, A., Pontrandolfo, P. & Scozzi, B. (2021), effectively manages change processes, minimizes resistance, and lays a solid foundation for long-term success in digital transformation initiatives. In the public sector, this model is particularly effective in managing change processes, minimizing resistance, and laying a foundation for long-term success in digital transformation initiatives (Bala, 2022).

The successful implementation of digital transformation in the public sector necessitates a considered approach, leveraging established models to navigate its intricacies. The McKinsey 7S Model, Kotter's 8-Step Change Model, the Prosci ADKAR Model, and Lewin's Change Management Model each offer unique insights and methodologies. Collectively, they provide a comprehensive framework for guiding public sector entities through the complex journey of digital transformation.

2.4 Challenges of Digital Transformation in the Public Sector

The pathway to digital transformation within the South African public sector represents a complex interplay of progress and challenges. As noted by Maremi, Thulare and Herselman (2022) while there are advancements in digital technology adoption, the journey is far from

complete, with several significant impediments hindering the process. This section critically examines the primary challenges, drawing from contemporary academic insights to provide a comprehensive understanding of these obstacles.

2.4.1 Skills and Intellectual Capital

Skills and intellectual capital are critical components in the digital transformation of the public sector. The successful implementation of digital initiatives relies heavily on the availability of skilled personnel who can navigate and leverage new technologies. As noted by (Kitsios et al., 2023), the development of digital skills within the public sector workforce is essential for adapting to rapidly evolving technological landscapes.

The South African public sector faces significant challenges in building and retaining the necessary skills and intellectual capital. According to Guenduez and Mergel (2022), there is a substantial skills gap that hampers the effective adoption and implementation of digital technologies. This skills gap is evident in both technical competencies and managerial capabilities, which are crucial for driving digital transformation. Recent initiatives aimed at addressing this skills gap include comprehensive training programs and partnerships with educational institutions. For example, the collaboration between the South African government and universities has been instrumental in developing tailored training modules that focus on digital skills and competencies relevant to public sector needs (Kariem, 2021).

Moreover, intellectual capital in the public sector is not solely about technical skills but also encompasses strategic thinking, problem-solving abilities, and innovation. As highlighted by Guenduez and Mergel (2022), fostering a culture of continuous learning and innovation is vital for sustaining digital transformation efforts. Public sector organizations must create environments that encourage knowledge sharing and continuous professional development. In addition, leveraging international best practices and lessons learned from other countries can enhance the intellectual capital of the South African public sector. The adoption of frameworks and models that have been successful in other contexts can provide valuable insights and guide the development of local strategies.

2.4.2 Information and Communication Infrastructure

The development and availability of robust information and communication infrastructure is a pivotal challenge in the digital transformation of the South African public sector (Sithole,

2019). Mkhathshwa and Mawela (2023) emphasize the critical role played by advanced technologies such as cloud computing, the Internet of Things (IoT), and smart logistics in shaping digitally transformed societies. These technologies form the backbone of a digitally enabled public sector, facilitating efficient service delivery, enhanced interconnectivity, and improved citizen engagement. However, the South African public sector faces significant hurdles in this regard. The World Bank highlights the necessity of investing in telecommunications infrastructure, including broadband and other internet technologies, to provide the necessary digital connectivity (The World Bank, 2019). In South Africa, broadband penetration remains notably low, impeded by a combination of supply-side factors like infrastructure competition, legislation, and regulation, as well as demand-side factors such as the perceived value of these technologies by citizens and their affordability.

Furthermore, the African Union identifies additional challenges in the context of developing countries, including economic constraints, poverty, and poor social infrastructure, which contribute to the government's reprioritization of broadband development (African Union, 2020). This situation is exacerbated by socio-cultural factors affecting the acceptance of new technologies in society. As a result, South Africa's digital infrastructure lags behind, limiting the scope and impact of digital transformation efforts in the public sector (Dener, Nii-Aponsah, Ghunney, & Johns, 2021). The inadequacy of information and communication infrastructure not only hampers the delivery of digital services but also constrains the potential for innovation and integration of new technologies in public sector operations. This infrastructure deficit acts as a significant barrier to realizing the vision of a digitally inclusive society, where government, citizens, and businesses are seamlessly connected and can leverage the full benefits of digital technologies.

2.4.3 Security and Privacy Concerns

Security and privacy issues stand as significant barriers in the digital transformation journey of the South African public sector. The escalation of cybercrimes in the digital age necessitates a robust framework to protect sensitive information and ensure the privacy of citizens. The African Union underscores the importance of developing comprehensive legal and policy measures to counteract cybercrime, which includes criminalization, procedural powers, jurisdiction, international cooperation, and responsibilities for internet service providers (African Union, 2020). Despite these recognized needs, the South African government faces hurdles in establishing a comprehensive cybersecurity landscape (Sithole, 2019). The approval

of the National Cybersecurity Policy Framework (NCPF) in 2015 was a significant step towards safeguarding national information and communication infrastructure against cyberattacks (South Africa, 2015a). However, as the State Security Agency notes that challenges persist due to inadequacies in the legislative framework. Existing laws, such as the : Electronic Communications and Transactions Act, 2002 (No. 25 of 2002), the Regulation of Interception of Communications and Provision of Communication-related Information Act, 2002 (Act No. 70 of 2002), and National Strategic Intelligence Amendment Act, 2002 (Act No. 67 of 2002), are fragmented and lack coordination, leading to gaps in the nation's cybersecurity defences (Sithole, 2019).

2.4.4 Leadership, Power Politics, and Legitimacy

According to Manda (2022) the successful implementation of digital transformation in the South African public sector is intricately linked to the dynamics of leadership, power politics, and legitimacy. Manda (2022) asserts the profound connection between power and institutional effectiveness, indicating that the way power is exercised within government institutions significantly impacts policy implementation and effectiveness. This connection becomes particularly salient in the context of digital transformation, where strategic vision and leadership are critical.

In South Africa, the digital transformation agenda has been influenced heavily by the interplay of leadership and power politics. Political dynamics, including the prioritization of certain policies over others due to political interests, have a substantial impact on the advancement of digital initiatives. The fluctuating commitment of political leadership to the digital agenda, as well as the prioritization of policies driven by political ambitions rather than national interests, poses considerable challenges to the digital transformation process (Manda, 2022). Moreover, the issue of legitimacy is also critical in this context. Manda and Backhouse (2017) highlight the social obligations of the government and how digital transformation initiatives, which may lead to job losses due to automation, could affect the government's legitimacy, especially in a country grappling with high unemployment rates. The government's ability to fulfil its social obligations, including addressing poverty, inequality, and unemployment, is intrinsically linked to its legitimacy. Failures in delivering on these fronts, coupled with setbacks in digital transformation, can further erode the government's credibility.

2.4.5 Policy Implementation Challenges

Implementing digital transformation policies within the South African public sector is fraught with complexities. According to the findings presented by Manda and Backhouse (2017) these challenges are multifaceted, encompassing issues such as inadequate monitoring and evaluation, lack of political leadership support, governance issues, and the influence of power dynamics and politics in policy prioritization. A primary issue in policy implementation, as highlighted by Manda and Backhouse (2017), Manda (2022) and Elsafty and Yehia (2023) is the lack of robust monitoring and evaluation mechanisms. This deficiency hinders the ability to assess the effectiveness of digital initiatives accurately, leading to challenges in adapting strategies in response to emerging issues and ensuring alignment with intended objectives. The absence of such mechanisms undermines the iterative improvement process crucial for the success of digital transformation efforts.

Moreover, the fluctuating levels of political commitment to the digital agenda significantly impact policy implementation (Elsafty & Yehia, 2023). Manda and Backhouse (2017) point out that inconsistent political backing leads to a lack of continuity in digital initiatives, hindering their integration into broader governmental strategies. The commitment and support of political leaders are essential for driving policy initiatives forward, allocating necessary resources, and overcoming bureaucratic hurdles (Manda, 2022). Accordingly, governance issues, particularly in the coordination and harmonization of efforts across different government departments and agencies, also pose significant challenges. The presence of siloed approaches and conflicting priorities among various government entities can create inefficiencies and redundancies in the implementation of digital policies (Elsafty & Yehia, 2023). These governance challenges necessitate a more integrated and collaborative approach to ensure the effectiveness of digital transformation initiatives.

2.5 State of Digital Transformation in the South African Public Sector

The South African public sector is progressively embracing digital transformation, though this journey is characterized by uneven advancements across different departments. Initiatives such as online portals and mobile applications for services like citizen registration, tax payments, and information access reflect this shift towards digitalization (Danielle & Masilela, 2020). Government departments are also beginning to leverage data and analytics for informed policy-making (Plantinga & Adams, 2021). However, according to Blom and Uwizeyimana (2020)

challenges persist, including infrastructure limitations, disparities in digital skills, resistance to change, and the need for enhanced cybersecurity measures.

The future strategy for digital transformation in South Africa's public sector is centred around enhancing digital accessibility and optimising efficiency (Manda & Ben Dhaou, 2019). The objective of this transformation is to facilitate citizens' access to government services such as birth registration, healthcare, and tax filing through online platforms and applications driven by artificial intelligence (Sigwejo & Pather, 2016). This will improve the delivery of services and revolutionise the way citizens engage with the government. This revolution encompasses more than the assimilation of novel technology; it signifies a transition towards enhanced efficacy, openness, and a focus on the needs and preferences of citizens (Dwivedi et al., 2020). Instances of this transition can be seen in the adoption of cloud computing and artificial intelligence by the South African Revenue Service (SARS) for its online tax system (Deloitte & David, 2022), the utilisation of Robotic Process Automation (RPA) by the Department of Transport for appointment scheduling (News24 & Van der Post, 2022) and the incorporation of e-learning in Gauteng schools (Kubheka, 2019).

Nevertheless, there are other obstacles that need to be overcome, including limited resources, outdated IT systems, a shortage of digital skills, and the requirement for strong cybersecurity measures (Cloete, 2023; Gill & VanBoskirk, 2016; Manda & Backhouse, 2018; Maremi et al., 2022; Willie & Nkomo, 2019). Furthermore, it is imperative to tackle the digital gap in order to provide equitable access to digital services. Possible solutions to address these difficulties involve the establishment of public-private collaborations and the implementation of training programmes such as the Digital Literacy for All initiative by the (South Africa, 2020). The South Africa Digital Government Framework and the National Development Plan 2030 offer strategic direction for this endeavour, seeking to utilise technology to enhance the efficiency, transparency, and citizen-focused nature of the public service (South Africa, 2012, 2017).

2.5.1 Digital Transformation Framework in South Africa

South Africa's public sector digital transformation journey is underpinned by key national policies and initiatives, fostering enhanced service delivery, citizen engagement, and overall efficiency. The National Development Plan 20, as outlined by the National Planning Commission, serves as the cornerstone, advocating for digital transformation as a vital component for economic and social development (South Africa, 2012). This plan encompasses

critical projects like the "Connect SA" broadband initiative led by the Department of Communications and Digital Technologies for widespread internet access , the Digital Future: A Public Service IT Policy Framework from the Department of Public Service and Administration for streamlined online services, and data-driven decision-making initiatives spearheaded by Statistics South Africa (Jakoet-Salie, 2020).

Furthering these efforts, the National E-government framework operationalizes the NDP 2030's vision, focusing on pillars like digital infrastructure, as supported by the South African Broadband Infrastructure Fund, and digital skills enhancement in the public sector, highlighted in the E-Government Skills Development Program by the Department of Public Service and Administration (Jakoet-Salie, 2020). This framework also stresses the importance of data governance, backed by the Protection of Personal Information Act, and encourages open data and interoperability through initiatives like the Government Open Data Portal.

The Department of Public Service and Administration (DPSA) plays a pivotal role in this transformation, driving projects like the Smart Citizen Engagement Platform and the Open Government Data Portal to foster accessible, data-driven public services (Jakoet-Salie, 2020). Through these concerted efforts, South Africa is steadily navigating its path towards a digitally empowered future in public service, guided by comprehensive policies and a commitment to inclusive and efficient digital transformation.

2.5.2 Gauteng E-Government Department Digital Transformation

The Gauteng E-Government Department (GED) plays a pivotal role in South Africa's digital transformation efforts, striving to provide efficient, transparent, and citizen-centric services to the province's 13 million residents. This part of the literature review explores the initiatives, achievements, obstacles, and opportunities for improvement within the GED's digital transformation journey.

The GED has implemented several key digital initiatives aimed at revolutionizing service delivery in Gauteng. One such initiative is the Gauteng Broadband Network, which seeks to connect government buildings with high-speed internet, thereby greatly improving online access to services (South Africa, 2019). Another notable initiative is the Paperless Education project, which equips schools with digital tools and resources to enhance digital literacy and learning experiences (South Africa, 2015b). Additionally, the G-Connect and Service Delivery

War Room (Ntirhisano) offer centralized online services and real-time monitoring of service delivery performance using data analytics (South Africa, 2022). Lastly, the E-Government Innovation Hub fosters collaboration between government entities, private sector organizations, and academia to encourage innovative e-government solutions (South Africa, 2023a)

These initiatives have yielded significant achievements in terms of enhanced online service delivery and data-driven decision-making. However, it is important to acknowledge that there are also obstacles hindering further progress. Resource constraints pose a challenge as limited funding and human resources can impede the implementation of new technologies and initiatives (South Africa, 2023b). Legacy systems present another obstacle as outdated infrastructure may not be compatible with modern digital platforms (National Planning Commission, 2020). Moreover, the issue of the digital divide remains prevalent in Gauteng. This divide refers to disparities in access to technology and connectivity among different socio-economic groups, potentially excluding certain segments of the population from benefiting fully from digital transformation efforts (Gauteng Department of e-Government, 2021)

The Gauteng E-Government Department's digital transformation journey showcases a range of initiatives aimed at improving service delivery and leveraging technology for the benefit of citizens. While achievements have been notable, challenges such as resource constraints, legacy systems, and the digital divide must be addressed to ensure continued progress in this transformative process.

2.6 Chapter Summary

The literature review in Chapter 2 delves into digital transformation within South Africa's public sector, focusing on policies, the progress in Gauteng's E-Government Department, and existing challenges. It underscores the need for a comprehensive approach to digitalization, emphasizing bridging the digital divide, enhancing data governance and cybersecurity, and centring citizen needs. The chapter suggests learning from Gauteng's experiences, promoting public-private partnerships, and continuous improvement as keys to overcoming challenges like resource limitations and outdated systems. It concludes that collaborative efforts from government, citizens, and the private sector are essential for successful and inclusive digital transformation.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This section introduces the research on digital transformation within the South African public sector. It emphasizes the importance of a robust methodology to explore the complexities and nuances of this phenomenon. The focus is on stakeholders in Gauteng's Department of e-Government, aiming to understand their experiences with digital transformation. This understanding is key to identifying the factors that contribute to successful implementation of digital technologies in this specific context. The introduction sets the stage for the subsequent sections, which detail the research design, methods, and ethical considerations.

3.2 Research design

According to Flick (2015) research design is a framework that outlines the procedures for conducting and analysing a research study. It serves as a blueprint for the collection, measurement, and analysis of data. In exploring the complexities of digital transformation within South Africa's public sector, this study adopted a qualitative research design. Qualitative research design focuses on understanding human experiences and social contexts, emphasizing in-depth exploration of phenomena through methods like interviews and observations, rather than quantifiable metrics (Willig, 2017). This approach is particularly suited for investigating phenomena where context, depth, and nuance are paramount. By focusing on qualitative data, the research aimed to capture the rich, detailed narratives and experiences of individuals who are navigating through the digital transformation in Gauteng's Department of e-Government.

Central to the qualitative methodology is the phenomenological approach, which is instrumental in understanding the essence of individual experiences related to digital transformation (Creswell & Poth, 2018). This approach aligned with the objective to delve into the subjective perceptions, challenges, and opportunities encountered by stakeholders. According to Creswell and Poth (2018) phenomenology allows researchers to explore the deeper meanings and essences of experiences, moving beyond surface-level observations to grasp the underlying dynamics of digital transformation. The choice of a phenomenological approach was further bolstered by its compatibility with various theoretical frameworks relevant to digital transformation. This included theories related to organizational change, technology adoption, and stakeholder management. By situating the phenomenological inquiry

within these theoretical contexts, the aim was to draw out richer insights and more robust conclusions.

This research design was carefully tailored to address the specific nuances and challenges of digital transformation in the South African context. It recognized the unique socio-economic, cultural, and political factors at play, ensuring that the findings are relevant and actionable within this specific setting. The qualitative, phenomenological approach offered the flexibility and depth required to capture the complex realities of digital transformation in a public sector environment that is marked by both opportunities and challenges.

3.3 Data collection

Flick (2018) defines data collection as a crucial process in research, entailing the systematic gathering of information pertinent to the study's objectives. Its importance lies in providing the empirical evidence needed to support or refute the research hypotheses. To acquire a comprehensive understanding of the multifaceted realities of digital transformation in Gauteng's public sector, this study employed a multifaceted approach to data collection, utilizing both semi-structured in-depth interviews and document analysis.

3.3.1 Data Collection Methods

3.3.1.1 Semi-structured in-depth interviews

Semi-structured in-depth interviews are a key data collection method in this study. This approach, as outlined by Flick (2018) is vital for exploring the nuanced experiences of participants involved in digital transformation. It allows for guided discussions while providing the flexibility for participants to express their views and experiences in their own words. This method offers a flexible yet focused approach, allowing participants to share their individual experiences while guiding the conversation towards key research themes (Creswell & Poth, 2018). This facilitates rich and detailed data collection, enabling nuanced understandings of participants' perceptions, challenges, and motivations. To ensure consistency and maintain research objectives, a semi-structured interview guide outlining core topics was developed, allowing for participant-driven exploration within thematic boundaries.

3.3.1.2 Document analysis

Document analysis, as a complement to interviews, involves a systematic examination of relevant documents within the research field. This method, highlighted by Armstrong (2020), is crucial for providing contextual background and enhancing the understanding of the research

topic. In this study, it entails analysing policy papers, strategic plans, and official reports related to digital transformation in Gauteng's Department of e-Government. Document analysis aids in corroborating and contextualizing the information gathered from interviews, offering a comprehensive view of the digital transformation landscape.

3.3.2 Data Collection Strategy

In this study, the data collection was meticulously orchestrated to capture a comprehensive understanding of digital transformation within the Department of E-Government in Gauteng. Two primary methods were employed: semi-structured in-depth interviews and document analysis. This dual approach was designed to provide a rich, multifaceted perspective on the digital transformation process, combining personal insights with an analysis of policy and strategic documents.

3.3.2.1 Semi-Structure Interviews

Semi-structured in-depth interviews formed the cornerstone of the data collection process. A total of 16 participants, representing various roles within the Department of E-Government, were interviewed to gather diverse perspectives on digital transformation. Each interview was conducted individually, lasting approximately 30 minutes. This duration was chosen to encourage detailed yet focused discussions, allowing participants to freely express their views and experiences within a manageable timeframe.

The semi-structured nature of these interviews provided the flexibility to probe into specific areas of interest while ensuring that all relevant topics were covered. The interviews were designed to explore various aspects of digital transformation, including the challenges faced, opportunities identified, impacts on systemic issues, strategic initiatives, and governance. To maintain an environment conducive to open dialogue, the interviews were conducted virtually in settings that ensured confidentiality and participant comfort. The responses were meticulously documented in questionnaires during the interviews. The questionnaire format allowed for organized and efficient data collection, ensuring that key insights and nuances from the interviews were captured accurately.

3.3.2.2 Document Analysis

In addition to the interviews, the study incorporated an extensive document analysis. This analysis involved a review of a variety of documents from the Department of E-Government, such as policy documents, strategic plans, operational reports, and internal communications.

The aim was to supplement the insights gained from the interviews with a broader context. By analysing these documents, the study was able to draw on official data and narratives, providing a more comprehensive view of the digital transformation initiatives. The documents were selected for their relevance to the research themes and were meticulously examined to extract pertinent information about the department's strategies and outcomes. This approach of document analysis played a pivotal role in triangulating the data, ensuring a robust foundation for the research findings by corroborating the qualitative insights from the interviews with quantitative and objective data from institutional sources.

The integration of semi-structured interviews with document analysis provided a holistic view of digital transformation within the Department of E-Government. This combination of qualitative and quantitative methods ensured a balanced exploration of the topic, capturing both the subjective experiences of the individuals directly involved in digital transformation and the objective strategic and policy dimensions as documented by the department. By employing these two complementary methods, the study was able to gather a comprehensive dataset, offering a nuanced understanding of digital transformation in the public sector context of Gauteng, South Africa.

3.4 Sampling technique and sample size determination

3.4.1 Sampling Technique

Sampling in research refers to the process of selecting a subset of individuals from a population to represent the entire group (Van Haute, 2021). In this regard the sampling process in this study involved selecting a subset of individuals from the population to accurately represent the entire group. The study employed purposive sampling; a strategic choice designed to enrich the research with insights from individuals deeply involved in digital transformation within the South African public sector. This sampling technique is particularly suited for qualitative research where the focus is on gaining deep insights from participants with specific experiences or roles related to the research question (Gupta, Shaheen, & Reddy, 2018).

The selection of participants was based on their direct involvement and comprehensive knowledge of digital transformation efforts within Gauteng's Department of E-Government. This group comprised a varied set of individuals, numbering approximately 15 to 20, including policymakers, government officials, IT professionals, and citizens. This estimate was guided

by the principle of data saturation, the point at which no new information or themes emerge from interviews. The diversity within this participant pool was essential to encompass a wide range of perspectives, covering everything from strategic decision-making to the effects at the grassroots level. The intended number was determined with the understanding that it would provide a rich, varied set of insights, while also being pragmatic in terms of the depth of analysis required to achieve data saturation.

3.4.2 Sample Size

In qualitative research, sample size is often determined by the concept of data saturation, the point at which no new information or themes are observed in the data (Van Haute, 2021). This means that the sample size may not be fixed at the outset but will be determined iteratively, as data collection and analysis proceed. The researcher adhered to the principle of data saturation, a concept suggesting that sample size is determined when no new information or themes emerge from the data (Van Haute, 2021). Consequently, the initial sample size was not predefined but was instead assessed iteratively, with adjustments made as data collection and analysis progressed. The researcher diligently monitored the incoming data for signs of saturation to ensure that the sample was sufficient to develop a comprehensive understanding of the research topic. This flexible approach, inherent to qualitative research, permitted adaptations to the sample size. For instance, if emerging themes were identified or if certain viewpoints were inadequately represented, additional participants were considered for inclusion to guarantee a thorough and balanced exploration of digital transformation within Gauteng's Department of E-Government.

Exclusions from the study were carefully considered. Individuals who lacked direct involvement or substantive experience with digital transformation initiatives in the specified context were not included. This exclusion criterion ensured that the study focused on participants who could provide rich, relevant insights into the phenomenon under investigation, thereby enhancing the quality and relevance of the findings.

3.4.3 Sampling Strategy

The sampling strategy for the study was meticulously designed to encompass a broad spectrum of perspectives on digital transformation within the Department of E-Government in Gauteng. Participants from different professional roles contributed insights across multiple thematic areas, reflecting the multifaceted nature of digital transformation. The table below illustrates

the alignment of each participant's role with various themes relevant to their expertise and experience. All participants were involved in semi-structured interviews, and their insights were complemented by document analysis for a holistic understanding of the themes.

Table 4.4-1: Participants Sample Outline

Participant ID	Type of Respondent	Theme No.	Aligned Themes	Data Collection Tool
P1	Policymaker	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 4	Strategic Plans and Initiatives	
		Theme 6	Governance and Oversight	
P2	IT Professional	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Them 3	Systemic Issues and Development	
P3	Policy Maker	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 4	Strategic Plans and Initiatives	
		Theme 6	Governance and Oversight	
P4	Project Manager	Theme 3	Systemic Issues and Development	Semi-structured Interview
		Theme 4	Strategic Plans and Initiatives	
		Theme 5	Skills Development and Capacity Building	
P5	IT Analyst	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	
P6	IT Professional	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	
P7	Senior IT Manager	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview

Participant ID	Type of Respondent	Theme No.	Aligned Themes	Data Collection Tool
		Theme 3	Systemic Issues and Development	
		Theme 4	Strategic Plans and Initiatives	
		Theme 6	Governance and Oversight	
P8	System Administrator	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	
		Theme 5	Skills Development and Capacity Building	
P9	Network Engineer	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	
P10	Policy Advisor	Theme 4	Strategic Plans and Initiatives	Semi-structured Interview
		Theme 6	Governance and Oversight	
P11	Network Engineer	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	
P12	Project Manager	Theme 3	Systemic Issues and Development	Semi-structured Interview
		Theme 4	Strategic Plans and Initiatives	
		Theme 5	Skills Development and Capacity Building	
P13	Cybersecurity Specialist	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
P14	Technical Support	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 5	Skills Development and Capacity Building	
P15	Technical Support	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview

Participant ID	Type of Respondent	Theme No.	Aligned Themes	Data Collection Tool
		Theme 5	Skills Development and Capacity Building	
P16	Software Developer	Theme 1	Challenges, Opportunities and Benefits in Digital Transformation	Semi-structured Interview
		Theme 3	Systemic Issues and Development	

3.5 Data analysis techniques

Data analysis in research involved systematically examining the information gathered to uncover patterns, themes, and insights (Miles et al., 2020). In line with the qualitative nature of this study, data analysis was driven by an inductive thematic analysis approach. According to (Miles et al., 2020) this method is highly effective in identifying, analysing, and reporting patterns themes within data. It allowed for a flexible and detailed examination of the data, facilitating the emergence of rich, nuanced insights into digital transformation within the public sector.

The analysis began with a thorough reading of the interview transcripts and documents to gain an initial understanding. Coding was done iteratively; initial codes were generated to tag segments of data that appeared interesting and relevant to the research questions. These codes were then collated into potential themes, capturing something important about the data in relation to the research question (Miles et al., 2020). Initially, all interview transcripts were meticulously read to gain a comprehensive understanding of the dataset. This preparatory step was fundamental to familiarizing with the data and to form a preliminary interpretation of its overall content. Following this, the coding process commenced with the generation of initial codes. These codes were created to tag segments of data that appeared significant or pertinent in relation to the research questions. Each piece of data was examined for underlying meanings or patterns, which were then succinctly captured in these codes.

The coding process was iterative; after the initial round of coding, the codes were reviewed and refined to ensure they adequately captured the essence of the data. Codes were then grouped into potential themes through a collaborative process involving multiple analysts. This step was crucial for cross-verifying and enhancing the reliability of the interpretations made

from the data. Each potential theme was scrutinized and debated, ensuring it represented a coherent pattern in the dataset.

Further refinement of themes involved a detailed review, where the themes were checked against the dataset to ensure they accurately reflected the collected data. This review process also included a secondary coding check by an independent researcher to ensure coding consistency and reliability. The finalized themes were then defined and named, which involved consolidating and summarizing the core essence of what each theme represented about the data. This approach enhanced the validity and depth of the analysis, ensuring a comprehensive understanding of digital transformation in the South African public sector.

3.6 Ethical considerations

According to Iphofen and Tolich (2018) ethical considerations in research involve the principles and standards that govern the conduct of any study involving human participants. These considerations are crucial to ensure the integrity of the research and the protection of participants' rights and well-being. Ethical considerations include obtaining informed consent, ensuring confidentiality and privacy, avoiding harm, and maintaining objectivity. In this study on digital transformation within South Africa's public sector, these ethical principles guide every aspect of the research process, from data collection to analysis and reporting, to uphold the highest standards of research ethics and ensure responsible and respectful treatment of all participants.

3.6.1 Adherence to Ethical Standards

This research is committed to the highest ethical standards in all aspects of its methodology. Recognizing the sensitivity and potential impacts of studying digital transformation within the public sector, the study adheres to ethical principles of respect, responsibility, integrity, and accountability.

3.6.2 Informed Consent and Voluntary Participation

Participants will be thoroughly briefed about the purpose, methods, potential impacts, and confidentiality of the study. Consent will be obtained in a written form, ensuring that participation is voluntary, and participants are aware of their right to withdraw at any time without any adverse consequences.

3.6.3 Confidentiality and Anonymity

All data collected, including interview transcripts and personal information, will be stored securely. Identifiable information will be anonymized in any reports or publications resulting from this research. The study will ensure that individual privacy is respected, and the data is used solely for research purposes.

3.6.4 Data Handling and Storage

Strict procedures will be in place for data handling and storage. digital data will be encrypted and stored on a secure server, while any physical documents will be kept in a locked cabinet. Access to the data will be limited to the research team, and all data will be destroyed after a specified period, in compliance with data protection regulations.

3.6.5 Ethical Review and Approval

The research proposal, including the ethical considerations and measures for participant protection, has been submitted for review and approval by an appropriate ethics committee. This process ensures that the study meets the required ethical standards and addresses any potential risks or issues.

3.7 Chapter Summary

This chapter has outlined the methodological framework employed in this study, highlighting the rationale and design choices made to investigate the challenges and opportunities of digital transformation implementation within Gauteng's department of e-government. The qualitative approach, coupled with diverse data collection methods and rigorous ethical considerations, aims to illuminate the lived experiences of key stakeholders, allowing for a rich and nuanced understanding of the complexities of digital transformation in the South African public sector context. This, in turn, will provide valuable insights and recommendations to inform future digital transformation strategies and maximize its potential benefits for both the government and citizens of Gauteng.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter delves into the presentation and discussion of findings derived from the questionnaires employed in this study. It is structured to systematically unfold the results, juxtaposing them with relevant literature to either corroborate or challenge these findings. The chapter commences with a detailed exposition of the collected data, highlighting its significance in the context of digital transformation within the South African public sector. Through careful categorization and organization of the data, this chapter offers an understanding of the complexities and nuances involved in the digital transformative process.

4.2 Response Rate

In this study, the primary methods of data collection were twofold, conducting semi-structured interviews with key personnel from Gauteng's Department of e-Government and performing document analysis. The department initially identified a list of 23 potential interviewees who held various roles and perspectives crucial to the department's digital transformation efforts. These individuals included policymakers, IT professionals, and other official's integral to the process.

The interviews conducted provided in-depth, qualitative insights crucial for a comprehensive understanding of the digital transformation in the South African public sector. The high level of engagement in these interviews can be attributed to the direct relevance of the study to the participants' roles and to the effective coordination of the interview process. This approach ensured that the research captured a broad spectrum of experiences and perspectives, thereby enriching the study with valuable data on the impacts and challenges of digital transformation within the sector.

Alongside the interviews, the study also involved a thorough analysis of various documents, including policy documents, strategic plans, and annual performance reports of the department. This document analysis supplemented the data obtained from the interviews, providing a broader contextual understanding, and aiding in triangulating the findings.

Together, the semi-structured interviews and document analysis formed the core of the data collection process. The combined insights from these methods ensured that the study captured

a wide range of perspectives and experiences, contributing to a nuanced and well-rounded understanding of digital transformation initiatives within the public sector. This approach highlights the depth and relevance of the study, focusing on quality and comprehensiveness of information over mere numerical metrics.

4.3 Participants

The participants of this study were integral in providing insights into the dynamics of digital transformation within the Department of E-Government in Gauteng. A total of 16 individuals, predominantly, were engaged in the study. These participants held various roles within the department, each contributing unique perspectives based on their professional experiences and expertise. Their roles ranged from policymakers and IT professionals to project managers and other key positions that interact with digital transformation processes. The diversity in roles ensured a comprehensive understanding of the challenges and opportunities in implementing digital strategies. The demographic and role-specific details of these participants are presented in Table 1.

Table 4.3-1: Participants' Demographics

Participant ID	Gender	Race	Professional Role
P1	Male	Black	Policymaker
P2	Male	Black	IT Professional
P3	Female	Black	Policy Maker
P4	Male	Black	Project Manager
P5	Female	Black	IT Analyst
P6	Male	Black	IT Professional
P7	Male	White	Senior IT Manager
P8	Female	Coloured	System Administrator
P9	Male	Black	Network Engineer
P10	Male	Black	Policy Advisor
P11	Male	Black	Network Engineer
P12	Female	Black	Project Manager
P13	Male	Black	Cybersecurity Specialist
P14	Male	Black	Technical Support
P15	Female	White	Technical Support
P16	Male	Black	Software Developer

The participants were selected for their direct involvement in or impact from the digital transformation initiatives within the department. Their insights were crucial in understanding not only the technical aspects of digital transformation but also its broader implications on policy, strategy, and service delivery.

4.4 Presentation of Key Findings

This section of the chapter systematically presents the findings from the study on digital transformation within the Department of E-Government in Gauteng. The data collected through semi-structured interviews and documented via questionnaires, coupled with the analysis of relevant documents, have culminated in a series of themes that reflect the complexities and nuances of digital transformation in the public sector. These themes are not only reflective of the participants' perspectives but also resonate with the broader strategic and operational dynamics of digital transformation within the department. The findings are organized thematically, each theme representing a distinct aspect of digital transformation as experienced and perceived by the participants. This thematic presentation facilitates a coherent and focused exploration of the data, allowing for an in-depth understanding of each aspect of digital transformation. The themes emerged through a careful analysis of the interview responses and were further validated and enriched by the insights gained from the document analysis.

Each theme is explored in detail, providing a rich and comprehensive understanding of the respective aspects of digital transformation as experienced by the participants and observed in the policy and strategic documents. This thematic presentation not only illuminates the various dimensions of digital transformation but also serves as a foundation for the subsequent discussion and analysis in the following chapters of the study.

4.4.1 Challenges in Digital Transformation

The first theme focuses on the challenges encountered in the process of implementing digital transformation within the Department of E-Government. Participants highlighted several key challenges, including infrastructure limitations, resistance to change, budgetary constraints, policy and regulatory hurdles, cybersecurity concerns, and a skills gap in digital literacy.

Participants described how outdated technological infrastructures are hindering the adoption of new digital solutions. P8 remarked, "Our old methods don't always work with newer

technologies, which is a big problem on our way to becoming more digital." This sentiment was echoed in the strategic plans reviewed, which emphasized the need for infrastructure upgrades. For example, the reliance on legacy financial systems that are incompatible with modern digital solutions has resulted in delays in data processing and difficulties in remote access (Gauteng Department of e-Government, 2021).

Resistance to change emerged as another significant challenge. P1 noted, "People are clearly afraid of new technology. Changing how people think is just as important as having the right tools." This challenge is further compounded by budgetary constraints, as another participant expressed, "We have ambitious digital goals, but our budget doesn't always align with these aspirations." A budget analysis revealed that while there were allocations for digital upgrades, However, they proved to be insufficient to cover both the necessary technological investments and comprehensive staff training programs.

Policy and regulatory complexities were also identified as barriers. The intricate web of government regulations can slow down the implementation of digital initiatives (Cloete, 2023). "It's hard enough to get digital projects started without having to deal with all the red tape." P3 stated. Specific instances include delays in project approvals and the need for compliance with multiple overlapping regulatory requirements, which often resulted in significant bureaucratic hold-ups.

Cybersecurity concerns are increasingly prominent, with participants emphasizing the need to safeguard data in an increasingly digital world. "There is a greater chance of data breaches as more services move online. Protecting data is very important." explained P13. Examples of the recent incidents where attempted breaches were thwarted highlighted the critical need for robust cybersecurity measures. A notable example is the recent cyberattack on South Africa's Companies and Intellectual Property Commission (CIPC) business registry, which targeted sensitive business data and disrupted services. This incident underscores the critical need for robust cybersecurity measures to protect against such threats (ITWeb, 2024)

Finally, the skills gap in digital literacy among staff was highlighted as a major hurdle. "Our workforce needs more training to handle the digital tools and platforms we're introducing," mentioned P8, which was a sentiment supported by internal training reports that pointed to the

need for ongoing digital skills development (Gauteng Department of e-Government, 2021). Detailed accounts of training sessions indicated mixed results, with some employees quickly adapting to new tools while others struggled, underscoring the need for tailored and continuous training programs.

4.4.2 Opportunities and Benefits of Digital Transformation

Following the discussion of challenges, the second theme explores the opportunities and benefits that digital transformation offers. Participants spoke of improved service delivery, enhanced citizen engagement, and increased operational efficiency as key benefits.

The introduction of digital platforms was seen as a means to streamline processes and improve service delivery. "Digital transformation could make our services much faster, making them easier for people to use and more available" P3 observed. Documents pertaining to e-Government initiatives reinforced this, outlining how digital tools can enhance citizen access to services (South Africa, 2017). For example, the implementation of the South African Revenue Service's (SARS) eFiling system serves as a prime example. This platform has significantly reduced the time required for tax submissions and processing, making it easier for citizens to comply with tax obligations and for the agency to handle filings more efficiently (SARS, 2022)

Enhanced citizen engagement was another benefit highlighted. Participants noted that digital platforms offer new ways to interact with citizens. The Gauteng Provincial Government's Ntirhisano Service Delivery War Room initiative, which utilizes digital platforms to track and respond to service delivery issues in real-time, exemplifies this benefit. This initiative has enabled the government to address citizen complaints more swiftly and transparently, thereby increasing public trust and participation (Gauteng Provincial Government, 2021). P10 stated, "Digital channels give us more ways to connect with people, get their comments, and make our services better based on that".

Operational efficiency was also identified as a significant benefit. "By digitizing our processes, we can achieve greater efficiency and reduce costs in the long run," said P7. This was corroborated by efficiency reports which detailed how digital initiatives could streamline operations and reduce administrative burdens (Gauteng Provincial Legislature, 2022). An example is the use of Robotic Process Automation (RPA) by the Gauteng's Provincial Treasury

for processing of invoice across the Gauteng provincial departments (ITWeb, 2023). The goal is to streamline operations, reduce processing times, and improve accuracy in handling invoices.

The findings under this theme underscore the potential of digital transformation to revolutionize the way public services are delivered and managed, aligning with the broader goals of efficiency and citizen-centric governance.

4.4.3 Systemic Issues and Development

This theme examines how digital transformation can impact systemic issues and contribute to broader development goals. Participants discussed how digital initiatives could address long-standing systemic challenges and foster socio-economic development.

A key point raised was the potential for digital transformation to bridge service delivery gaps, especially in underserved communities (Manda & Backhouse, 2017). " Digital tools can help us get to areas that we couldn't get to before and give them things they need." P10 mentioned. Policy documents on digital inclusion strategies supported this, highlighting the role of digital services in promoting equitable access (Gauteng Department of e-Government, 2021), (Sigwejo & Pather, 2016). For example, in the Gauteng Department of e-Government, initiatives like the use of drone technology for delivering medical supplies to remote areas have significantly improved healthcare access (Kamnqa, 2021). This technology ensures timely delivery of essential medicines and vaccines, which are critical for health services in areas with poor infrastructure.

Moreover, participants discussed how digital transformation aligns with broader development goals, such as improving education, healthcare, and economic opportunities. " With the help of digital tools, we can reach communities that we couldn't get to before and give them things they need." commented P3. This view was reflected in the department's strategic development plans, which linked digital transformation to the achievement of sustainable development goals (South Africa, 2023a). This is exemplified by the Department of Education's initiative to introduce e-learning platforms in schools lacking traditional educational resources, which has enhanced learning outcomes in under-resourced areas (Kubheka, 2019).

The insights in this theme reveal the transformative potential of digital initiatives in addressing systemic challenges and contributing to holistic development.

4.4.4 Strategic Plans and Initiatives

In this theme, the focus shifts to the strategic plans and initiatives undertaken as part of digital transformation efforts. Participants shared insights into the planning and execution of various digital projects and how these align with the department's strategic objectives.

Strategic planning was identified as crucial in driving successful digital transformation. "Strategic planning is the key to any digital project's success." P3 stated. The review of strategic documents echoed this, outlining the roadmaps and frameworks developed to guide digital transformation efforts (South Africa, 2020), (Gauteng Department of e-Government, 2021).

Participants also discussed specific initiatives, such as the development of e-government platforms and the digitization of records. "We are working on several projects that are aimed at making government services more efficient and transparent," mentioned P12. For example, the Gauteng Broadband Network (GBN) is a significant initiative aimed at improving internet connectivity across government buildings. This project, as outlined in the Gauteng Department of e-Government's 2021 strategic plan, is designed to enhance digital access, and support the implementation of various e-government services.

This theme highlights the importance of strategic planning in digital transformation and provides insights into the specific initiatives being undertaken to achieve digital goals.

4.4.5 Skills Development and Capacity Building

The fifth theme addresses the critical aspect of skills development and capacity building in the context of digital transformation. Participants emphasized the importance of equipping staff with the necessary skills and knowledge to navigate the digital landscape.

The need for ongoing training and development was a recurring point. "Continuous learning and upskilling are essential to keep up with the rapidly changing digital environment," P14 noted. This was supported by training program documents, which detailed the initiatives undertaken to enhance digital literacy among staff. For example, the Gauteng Department of e-Government implemented a comprehensive training program in 2021, which included

workshops on cybersecurity, data analytics, and the use of cloud services. These workshops were tailored to various levels of staff expertise, ensuring that both novice and advanced users could benefit (Gauteng Provincial Legislature, 2022).

Capacity building was also discussed in relation to fostering a culture of innovation and adaptability. "Getting people to be digitally aware is more than just teaching them basic skills. It's also about getting them to be open to new ideas." P12 added. A specific example of this can be seen in the "Innovation Hubs" initiative, where employees are encouraged to develop and pitch new ideas for digital tools and processes. This initiative not only promotes skill development but also cultivates a mindset geared towards continuous improvement and innovation (South Africa, 2023a).

This theme underscores the vital role of human capital in the success of digital transformation initiatives, highlighting the need for comprehensive skills development and capacity building programs.

4.4.6 Governance and Oversight

The final theme delves into the governance and oversight mechanisms that guide and monitor digital transformation processes. Participants discussed the frameworks and practices in place to ensure that digital initiatives are implemented effectively and align with overall objectives.

Effective governance was highlighted as key to the success of digital projects. "Robust governance structures help us navigate the complexities of digital projects and ensure they deliver value," P7 stated. Strategic governance documents reviewed in the study corroborated this, outlining the policies and procedures established to oversee digital initiatives. For instance, the South African National Treasury has developed the Public Sector Risk Management Framework, which provides guidelines for managing risks associated with digital initiatives (Department of National Treasury, 2010). This framework has been instrumental in ensuring that public sector digital projects adhere to best practices and deliver the intended benefits.

Oversight mechanisms, such as regular reviews and audits, were also discussed. "Regular monitoring and evaluation are crucial to keep digital projects on track and aligned with our goals," mentioned P1. An example of this in practice is the Auditor-General of South Africa's

(AGSA) regular audits of government IT projects, which have highlighted issues such as inadequate planning and budgeting, thereby prompting corrective actions (AGSA, 2023). These audits ensure accountability and transparency, providing insights into areas needing improvement.

This theme emphasizes the importance of strong governance and oversight in steering digital transformation efforts, ensuring that they are conducted in a transparent, accountable, and effective manner.

4.5 Analysis of Key Themes

In this section, the findings from the semi-structured interviews and document analysis are analysed in depth, connecting them to the study's research objectives and questions. This analysis is essential for a comprehensive understanding of the dynamics of digital transformation within the Department of E-Government in Gauteng. Each identified theme is scrutinized to unravel its implications and how it ties into the broader context of the study.

4.5.1 Challenges in Digital Transformation

This theme directly addresses the research objective of identifying key challenges in digital transformation within the Gauteng province's public sector. It responds to the research question about the specific challenges faced in implementing digital transformation in this context. The challenges revealed include infrastructure limitations, resistance to change, budgetary constraints, policy and regulatory complexities, cybersecurity concerns, and digital literacy gaps. The mention of infrastructure limitations, for instance, speaks volumes about the technological hurdles that impede the adoption of new digital solutions. Participants noted the struggles with outdated systems and incompatible technologies, which act as significant barriers to progress. Additionally, the issue of resistance to change among employees highlights a cultural and behavioural challenge that goes beyond mere technological upgrades. This resistance often stems from a fear of the unknown or comfort with established routines, posing a significant obstacle to innovation. The identification of these challenges is instrumental in understanding the multifaceted barriers to digital transformation and underscores the need for holistic solutions that address both the technical and human elements of the transition.

4.5.2 Opportunities and Benefits of Digital Transformation

This theme explores the opportunities and benefits of digital transformation, thereby addressing the research objective of examining the positive aspects and potential advantages that digital transformation can offer to the public sector. Participants expressed optimism about the potential of digital transformation to enhance service delivery, improve citizen engagement, and increase operational efficiency. The improvement in service delivery, as highlighted by the participants, includes the potential for faster, more accessible public services, made possible by digital platforms. This optimism is echoed in strategic documents, which outline how digitizing processes can make services more user-friendly and efficient. Furthermore, the aspect of enhanced citizen engagement is seen as a key benefit, with digital channels providing new ways to connect with and understand the needs of the public. This is particularly important in the context of governance, where effective public engagement is crucial. The insights under this theme suggest that despite existing challenges, digital transformation holds considerable promise for revolutionizing public services and enhancing the efficiency and responsiveness of the public sector.

4.5.3 Systemic Issues and Development

The analysis of this theme contributes to understanding the impact of digital transformation on broader systemic issues and development, which is one of the core aims of this research. The findings indicate that digital transformation can play a pivotal role in addressing longstanding systemic challenges and fostering socio-economic development. Participants discussed the potential of digital initiatives to bridge service delivery gaps, especially in underserved or hard-to-reach communities. This aligns with the department's strategic objectives, as outlined in various policy documents, which emphasize digital inclusion and equitable access to services. The insights also suggest that digital transformation aligns with broader development goals by integrating digital solutions into various sectors, such as education and healthcare, thus contributing to overall societal advancement.

4.5.4 Strategic Plans and Initiatives

This theme aligns with the objective to assess the impact of digital transformation strategies and initiatives in the public sector. It addresses the research question concerning the nature and effectiveness of these strategic approaches within the Gauteng province's public sector. The analysis of this theme reveals that the strategic planning and implementation of digital initiatives are crucial components of digital transformation. Participants discussed various

ongoing and planned projects, emphasizing the importance of aligning these initiatives with broader organizational goals. Strategic plans, as mentioned in the interviews and seen in the documents, often include initiatives like the development of e-government platforms and the digitization of records. Participants highlighted the importance of these strategic initiatives in facilitating smoother, more efficient public service delivery. However, challenges in aligning these initiatives with existing policies and procedures were also noted, indicating areas where strategic planning could be improved.

4.5.5 Skills Development and Capacity Building

The exploration of this theme is pertinent to the research objective of identifying strategies to leverage digital transformation opportunities, particularly in the context of human resource development. Participants emphasized the critical need for continuous skills development and capacity building to keep pace with digital advancements. The analysis revealed a significant skills gap in digital literacy and technical capabilities among staff, which is a major impediment to the effective implementation of digital strategies. Training programs and skill development initiatives were frequently discussed as essential components of a successful digital transformation strategy. Documents reviewed corroborated these points, highlighting departmental efforts in training and developing staff to meet the demands of a digitally transformed work environment.

4.5.6 Governance and Oversight

This theme is particularly relevant to the research objective of examining factors that hinder successful digital transformation, with a specific focus on governance and oversight. The findings under this theme underscore the significance of robust governance structures and oversight mechanisms in the successful implementation of digital initiatives. Participants discussed the challenges and complexities involved in governance, including the need for clear policies, accountability frameworks, and compliance monitoring. The analysis shows that effective governance and oversight are not just about enforcing rules; they are about ensuring transparency, efficiency, and alignment with strategic objectives. Documents analysed provided insights into the existing governance frameworks and highlighted areas where improvements are needed, such as in the integration of digital strategies with overall organizational governance.

4.6 Integration Of Findings to the Theoretical Framework

This section of the chapter focuses on synthesizing the empirical findings of the study with the established theoretical frameworks introduced in earlier chapters. The integration of these findings with theoretical perspectives provides a deeper, more structured understanding of the digital transformation processes observed in the Gauteng Province's Department of e-Government.

4.6.1 Applying the Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) provides a useful lens through which to view the challenges and opportunities related to technology adoption within the department. The findings related to staff resistance to change and apprehensions about new digital tools can be understood in terms of the perceived ease of use and perceived usefulness, two core constructs of TAM. For example, the resistance to change may reflect concerns over ease of use, while the enthusiasm among younger staff members might be attributed to their perception of the usefulness of these digital innovations. This theoretical perspective helps explain why certain digital initiatives were more readily embraced than others and guides potential strategies for increasing technology acceptance.

4.6.2 Diffusion of Innovations Theory in Context

The Diffusion of Innovations Theory offers insights into how new ideas and technologies spread within an organization (Rogers et al., 2014). The findings from this study, particularly those related to the dissemination of digital transformation initiatives and the collaborative efforts across departments, can be analysed through the lens of this theory. The theory's principles, such as innovation, communication channels, time, and social systems, illuminate the factors that influenced the adoption rate of digital initiatives in the department. For instance, the role of departmental 'champions' in advocating for and disseminating digital innovations aligns with the concept of 'early adopters' in the Diffusion of Innovations Theory.

4.6.3 Theoretical Underpinnings of Future Perspectives

The integration of theoretical frameworks is also crucial in understanding the future perspectives shared by participants. The cautious optimism regarding emerging technologies and the emphasis on continuous adaptation can be conceptualized through theories related to organizational change and technological readiness. These theories provide a backdrop for understanding the department's approach towards embracing future technological advancements and preparing for the challenges they might bring.

4.6.4 Bridging Theory and Practice

The integration of these theoretical frameworks with the study's findings bridges the gap between academic theory and practical application. It offers a more comprehensive understanding of the complexities involved in digital transformation, beyond the immediate empirical observations. This theoretical grounding is essential not only for interpreting the study's findings but also for informing future policy and strategy development within the realm of digital transformation in the public sector.

4.7 Chapter Summary

This chapter has provided a detailed analysis of the findings derived from semi-structured interviews and document analysis. The participation of key personnel in this study led to a substantial pool of data, with a notable response rate that reflects the engagement and interest of the department in this research. The findings have been methodically categorized into several pertinent themes: challenges and opportunities in digital transformation, factors hindering successful implementation, the impact on systemic issues and development, strategic plans and initiatives, skills development, and capacity building, as well as governance and oversight.

A significant aspect of the findings is the intricate interplay of challenges faced in the digital transformation journey. Infrastructure limitations, resistance to change, budget constraints, and policy and regulatory complexities were prominently featured as major hurdles. These challenges, however, are set against a backdrop of substantial opportunities that digital transformation presents, such as enhanced service delivery, improved citizen engagement, and increased operational efficiency. The transformative potential of digital initiatives in addressing broad systemic issues and fostering development was a recurrent theme, demonstrating a clear alignment with broader developmental goals and priorities.

Moreover, the study identified critical hindering factors such as organizational resistance and financial limitations, which are crucial considerations for policymakers and stakeholders. Strategic plans and initiatives that were part of the digital transformation efforts highlighted the forward-thinking approaches adopted by the department, yet also underscored the need for more streamlined and effective implementation strategies.

One of the key insights from the findings is the need for a focused approach on skills development and capacity building to address the digital literacy gap, which is vital for the successful adoption of digital initiatives. Additionally, the importance of effective governance and oversight mechanisms has been emphasized, underscoring the need for robust structures to guide, monitor, and evaluate digital transformation processes.

In summary, this chapter has laid a comprehensive foundation for understanding the current state and dynamics of digital transformation within the Department of E-Government in Gauteng. The insights gained from this analysis are significant for comprehending the complex facets of digital transformation in the public sector and set the stage for the subsequent discussions and conclusions in the following chapters.

CHAPTER 5:DISCUSSION

5.1 Introduction

This chapter embarks on an interpretative journey, contextualizing the findings from Chapter 4 within the broader academic and practical landscape of digital transformation in the public sector. It seeks to weave together the empirical data from the Gauteng Department of E-Government with existing theoretical frameworks and scholarly discourse.

The chapter revisits the primary objectives of the research: to explore the challenges and opportunities of digital transformation in the South African public sector, particularly focusing on the Gauteng province. A succinct summary of the key findings is provided, highlighting themes such as the multifaceted challenges, the array of opportunities, hindrances to successful implementation, impacts on systemic issues, and the critical need for strategic initiatives, skills development, and governance.

This chapter elucidates the intent behind this paper which is to critically analyse the findings in relation to existing literature and theoretical models, and to discuss their practical implications. The discussion aims to not only contribute to the academic understanding of digital transformation in public administration but also to provide insightful recommendations for policymakers and practitioners in the field.

5.2 Discussion of Key Findings

In this section of the report, a detailed discussion of the findings is undertaken, which involves meticulously drawing connections with existing literature to enrich the understanding of digital transformation within the public sector context of South Africa, particularly emphasizing the experiences and challenges within the Gauteng province's Department of E-Government. This discussion is pivotal in situating the study's findings within the broader academic discourse, providing not only a comparative analysis with similar studies but also offering a unique perspective on the specificities of the South African context.

Through this analytical process, the study aims to illuminate the multifaceted nature of digital transformation, exploring the interplay between technology, policy, human resources, and organizational culture in the public sector. This comprehensive examination is intended to provide a nuanced understanding of the phenomenon of digital transformation, shedding light

on both its transformative potential and the myriad challenges it presents. The ultimate goal of this discussion is to offer meaningful insights that can inform policy, practice, and future research in the field of public administration and digital transformation.

5.2.1 Challenges in Digital Transformation

The examination of the challenges in digital transformation as revealed by the study in Gauteng's Department of E-Government provides an opportunity to delve into the intricacies that hinder the effective implementation of digital strategies in the public sector. This section dissects these challenges, placing them within the context of existing literature to enhance understanding and draw parallels with global trends.

5.2.1.1 Infrastructural Limitations

One of the most pronounced challenges identified in this study is infrastructural limitations. The findings indicate that inadequate technological infrastructure significantly impedes the adoption and effective utilization of digital solutions. This observation echoes the conclusions drawn by Tangi, Janssen, Benedetti and Noci (2021), who pointed out that the lack of robust digital infrastructure is a critical barrier in public sector digitalization globally. The challenge here is not only the physical absence of technology but also the prevalence of outdated systems that are incompatible with contemporary digital demands. This issue underscores the necessity for substantial investment in modernizing technological infrastructure as a cornerstone for successful digital transformation.

5.2.1.2 Disparity in Digital Literacy

Another critical issue highlighted in the findings is the disparity in digital literacy among employees. This challenge, as emphasized by Ahn and Chen (2022), points to a broader problem of digital inclusivity in public sector transformations. The gap in digital skills and literacy not only hampers the efficient adoption of new technologies but also widens the divide within the workforce, impacting the overall success of digital initiatives. Addressing this issue requires focused efforts on digital literacy training and skill development, ensuring that all employees are equipped to participate in and contribute to the digital transformation process.

5.2.1.3 Cultural Resistance to Change

Additionally, the study reveals cultural resistance to change within organizations as a significant impediment to digital transformation. This challenge, involving both psychological and cultural dimensions, is a recurrent theme in the literature. Ramogayane (2022) discuss the necessity of addressing such resistance by fostering a culture that is receptive to change and

innovation. Overcoming this barrier involves strategic efforts to shift organizational mindsets and attitudes, making the transition to digital ways of working more acceptable and less intimidating.

5.2.1.4 Budgetary Constraints

Finally, the challenge of budgetary constraints is a key theme that emerges from the study. The limited allocation of financial resources for technological investments and staff training is cited as a primary obstacle. This finding is consistent with the broader narrative in public sector innovation, where financial limitations often hinder the adoption and effective implementation of new technologies. It calls for strategic financial planning and resource allocation that prioritize digital transformation initiatives, ensuring that they are adequately funded and supported.

The discussion of these challenges provides a detailed understanding of the barriers to digital transformation within the public sector. Each challenge, analysed in the context of existing literature, adds depth to the study's findings and offers a basis for formulating strategies to overcome these hurdles.

5.2.2 Opportunities and Benefits of Digital Transformation

The exploration of the opportunities and benefits arising from digital transformation in the Gauteng province's Department of E-Government offers crucial insights into the potential for growth and advancement in the public sector. These opportunities, identified through the study, have far-reaching implications, both in contributing to South Africa's broader developmental objectives and in the practical enhancements they can bring to public sector operations.

5.2.2.1 Enhanced Service Delivery and Broader Developmental Objectives

The potential for improved service delivery through digital transformation is closely tied to South Africa's broader developmental goals. By streamlining and enhancing public services, digital transformation initiatives can significantly contribute to achieving equitable access to essential services, a key aspect of socio-economic development. This aligns with the national priorities of reducing inequality and improving quality of life, as outlined in South Africa's developmental plans (South Africa, 2012). Improved service delivery, facilitated by digital platforms, not only increases efficiency but also ensures that government services are more responsive to the needs of all citizens, thereby promoting inclusivity and equality.

5.2.2.2 Increased Operational Efficiency and Practical Implications

The increase in operational efficiency, a notable benefit of digital transformation, has profound practical implications for the public sector. Enhanced efficiency in government operations leads to better resource management and cost savings. This aligns with the priorities of governmental fiscal responsibility and effective public resource management. The practical implications of this are vast, ranging from reduced operational costs to increased capacity to allocate resources to critical areas of public service. Nzimakwe (2021) emphasizes that such improvements in operational efficiency are essential for building a public sector that is not only cost-effective but also agile and adaptable to changing societal needs.

5.2.2.3 Enhanced Citizen Engagement and Democratic Governance

Enhanced citizen engagement, facilitated by digital transformation, is instrumental in advancing democratic governance. By providing platforms for increased citizen participation and feedback, digital initiatives contribute to a more transparent and accountable governance model. This aligns with South Africa's objectives of fostering active citizenry and participatory democracy, as highlighted in the National Development Plan (South Africa, 2012). The practical implications of this include a more engaged citizen base, improved public trust in government institutions, and a governance model that is responsive to the voices and needs of its citizens.

5.2.2.4 Addressing Systemic Challenges: Implications for Governance and Public Trust

Digital transformation's role in addressing systemic challenges in the public sector has significant implications for governance and public trust. By tackling issues such as bureaucratic inefficiencies and corruption, digital initiatives can lead to a more streamlined and accountable governance model. This not only aids in achieving the goals of effective governance but also helps in rebuilding public trust in government institutions, an essential factor in the stability and efficacy of public administration.

5.2.2.5 Socio-Economic Development through Digital Initiatives

Lastly, the contribution of digital transformation to socio-economic development is a critical aspect of its broader impact. Digital initiatives can enhance access to services, support the development of new economic opportunities, and promote overall societal well-being. This is particularly important in the context of South Africa's goals of reducing poverty and stimulating economic growth, as digital transformation can be a catalyst for creating new economic pathways and improving the livelihoods of citizens.

In summary, the opportunities and benefits identified in this study underscore the transformative potential of digital transformation in the public sector. They highlight not only the operational improvements but also the significant contributions these initiatives can make towards achieving South Africa's broader developmental objectives and enhancing democratic governance.

5.2.3 Systemic Issues and Development

The research findings on digital transformation in Gauteng's Department of E-Government also shed light on the implications for systemic issues and development. This area of discussion focuses on how digital transformation influences broader systemic changes within the public sector and its impact on overall development, particularly in the context of South Africa.

5.2.3.1 Addressing Systemic Public Sector Issues

The study reveals that digital transformation has the potential to significantly address various systemic issues within the public sector. This includes improving bureaucratic efficiency, enhancing transparency, and reducing corruption. Such changes are instrumental in reforming public sector operations, aligning them with best practices and global standards. As highlighted in the literature by (J. Bertot et al., 2016), the integration of digital solutions can lead to more streamlined and accountable governance processes. This is particularly relevant in the South African context, where public sector efficiency and transparency are crucial for good governance and public trust.

5.2.3.2 Impact on Socio-Economic Development

The findings also indicate that digital transformation can contribute to socio-economic development. By improving access to government services through digital platforms, there is a potential to positively impact various aspects of citizens' lives. This includes better access to healthcare, education, and other essential services, thereby contributing to the overall quality of life and well-being of the population. The study's findings resonate with the arguments presented by Danielle and Masilela (2020), who discuss the role of digital initiatives in enhancing governance and contributing to broader developmental goals.

5.2.3.3 Digital Transformation and Sustainable Development

Furthermore, digital transformation initiatives align with sustainable development goals, offering pathways to address social, economic, and environmental challenges. The use of technology can lead to more efficient use of resources, reduction in carbon footprint through

paperless operations, and better monitoring and management of sustainable development projects. This aspect is crucial for South Africa, where sustainable development is a key national priority, as outlined in the National Development Plan 2030.

5.2.3.4 Addressing Inequality and Enhancing Inclusivity

Another critical aspect of the impact of digital transformation on systemic issues is its role in addressing inequality and enhancing inclusivity. By providing equitable access to digital services, the government can ensure that all segments of the population, including marginalized communities, benefit from technological advancements. This is in line with the inclusive development approach advocated in the National Development Plan, aiming to bridge the digital divide and promote equal opportunities for all citizens.

In conclusion, the implications of digital transformation for systemic issues and development are far-reaching. They not only encompass improvements in public sector operations but also extend to contributing significantly to socio-economic development and sustainable, inclusive growth in South Africa. This aspect of digital transformation underscores its role as a catalyst for systemic change and development, beyond the confines of technological innovation.

5.2.4 Strategic Plans and Initiatives

The findings from the study concerning strategic plans and initiatives in the context of digital transformation within the Gauteng province's Department of E-Government offer valuable insights into the planning and execution aspects of digital strategies. This section discusses how these plans and initiatives align with the challenges and opportunities identified, and their implications for the future of digital transformation in the public sector.

5.2.4.1 Alignment with Digital Transformation Goals

The strategic plans and initiatives, as identified in the study, demonstrate a commitment to aligning with the broader goals of digital transformation. This alignment is crucial, as noted by Eggers and Bellman (2015), who underscore the importance of ensuring that strategic objectives are congruent with digital capabilities. The study's findings suggest that while there is a clear strategic direction in the Department of E-Government, the actual implementation of these strategies often encounters the challenges outlined earlier, such as infrastructural limitations and policy complexities. This highlights the need for strategies that are not only visionary but also adaptable and resilient to the changing digital landscape.

5.2.4.2 Importance of Human Capital in Strategy Execution

A key aspect of strategic planning for digital transformation is the focus on human capital. The findings point to the necessity of investing in skills development and capacity building, aligning with the perspectives of researchers like Cloete (2023), who emphasize the role of human resources in driving digital innovation. The study reveals that for strategic initiatives to be successful, there must be a concerted effort to equip the workforce with the necessary digital skills and literacy. This approach goes beyond merely implementing new technologies; it involves fostering a culture that embraces digital change and innovation.

5.2.4.3 Overcoming Barriers through Strategic Initiatives

The strategic initiatives identified in the study also play a crucial role in overcoming some of the barriers to digital transformation. By focusing on areas such as infrastructure development, policy reform, and digital literacy, these initiatives address the core challenges impeding digital progress. This approach is in line with the recommendations of Manda and Ben Dhaou (2019) who advocates for strategic planning that specifically targets the known barriers to digitalization in the public sector.

5.2.4.4 Future Orientation of Strategic Plans

The strategic plans and initiatives offer a roadmap for the continuous evolution of digital transformation in the public sector. As digital technologies rapidly evolve, it is imperative that strategic planning remains dynamic and forward-looking. This involves not only keeping abreast of technological advancements but also anticipating future trends and challenges. The study's findings suggest that for the Department of E-Government, this means ongoing evaluation and adjustment of strategies to ensure they remain relevant and effective.

In summary, the strategic plans, and initiatives in digital transformation within the Gauteng province's Department of E-Government are critical in shaping the path forward. These plans need to be comprehensive, adaptable, and inclusive, considering both technological and human aspects of digital transformation. The discussion underscores the importance of strategic planning in ensuring the effective implementation and sustainability of digital initiatives in the public sector.

5.2.5 Skills Development and Capacity Building

The analysis of the study's findings on skills development and capacity building illuminates their pivotal role in the success of digital transformation initiatives within the Gauteng

province's Department of E-Government. This section discusses the implications of these findings in the context of ensuring that the workforce is adequately prepared to meet the challenges and leverage the opportunities presented by digital transformation.

5.2.5.1 Necessity of Enhancing Digital Literacy and Skills

The study underscores the necessity of enhancing digital literacy and technical skills among public sector employees. This finding is in line with the arguments presented by Manana and Mawela (2022) who emphasize the critical role of skill development in successful digital transformation. The gap in digital skills and literacy, as highlighted in the research, can hinder the effective use and implementation of new technologies. Therefore, initiatives focused on training and development are crucial to bridge this gap, equipping employees with the necessary competencies to navigate and leverage digital tools effectively.

5.2.5.2 Aligning Skills Development with Digital Goals

The importance of aligning skills development and capacity-building initiatives with the broader digital goals of the organization is emphasized. This alignment is essential to ensure that training programs are not only imparting general digital skills but are also tailored to meet the specific needs of the digital transformation initiatives undertaken. Cloete (2023) highlight the significance of this alignment, noting that human capital development should be closely integrated with the strategic objectives of digital innovation. By doing so, the workforce is not only skilled but also strategically oriented to contribute effectively to the digital transformation journey.

5.2.5.3 Overcoming Resistance through Training and Development

The findings also suggest that targeted training and development can play a significant role in overcoming resistance to digital changes. As noted by Apleni and Smuts (2020), resistance to digital transformation often stems from a lack of understanding and fear of the unknown. Comprehensive training programs can mitigate these fears by providing employees with the knowledge and confidence to embrace new technologies. Such initiatives can foster a culture of innovation and adaptability, essential for the successful adoption of digital practices.

5.2.5.4 Continuous Learning and Adaptability

The dynamic nature of digital technologies necessitates a commitment to continuous learning and adaptability in skills development. The rapid evolution of digital tools and platforms means that skills development cannot be a one-time initiative but must be an ongoing process. This

continuous learning approach is vital to ensure that the public sector workforce remains agile and can adapt to new technologies and methodologies as they emerge.

In conclusion, the discussion on skills development and capacity building highlights their critical importance in the context of digital transformation. By investing in digital literacy and aligning skills development with strategic digital goals, public sector organizations can enhance their capability to successfully navigate and implement digital initiatives. Moreover, fostering a culture of continuous learning and adaptability is essential to sustain digital transformation efforts in the long term.

5.2.6 Governance and Oversight

The findings from the study pertaining to Governance and Oversight in the context of digital transformation within the Gauteng province's Department of E-Government highlight the crucial role of these aspects in ensuring the success and sustainability of digital initiatives. This section discusses the significance of governance and oversight mechanisms in the digital transformation process, underpinned by insights from relevant academic literature.

5.2.6.1 Role of Governance in Digital Transformation

The role of governance in digital transformation is pivotal. The findings suggest that effective governance structures are essential for steering and guiding digital initiatives, ensuring they align with organizational goals and public sector standards. This observation aligns with the work of Blom and Uwizeyimana (2020), who emphasize the importance of robust governance frameworks in providing direction and maintaining integrity in digital projects. Governance in this context goes beyond mere rule enforcement; it involves setting a vision, defining clear policies, and establishing accountability mechanisms. This ensures that digital transformation efforts are not only technically sound but also ethically grounded and strategically aligned with the broader objectives of the public sector.

5.2.6.2 Oversight Mechanisms for Accountability and Transparency

Oversight mechanisms play a critical role in ensuring accountability and transparency in the implementation of digital initiatives. As highlighted in the study, regular monitoring, evaluation, and reporting are key to maintaining the integrity of digital transformation efforts. These practices are supported by the findings of Chantillon (2021), who advocates for continuous oversight to identify potential issues, measure progress, and ensure compliance with established standards and objectives. Effective oversight serves to build trust among

stakeholders, demonstrating a commitment to transparency and responsible management of digital projects.

5.2.6.3 Leadership in Governance and Oversight

Leadership is a central component in governance and oversight, with leaders playing a crucial role in championing and upholding governance frameworks. The study's findings underscore the need for strong, visionary leadership that can navigate the complexities of digital transformation. Leaders must be adept at managing change, fostering a culture that embraces digital innovation while adhering to governance principles. This aligns with the perspectives of Chantillon (2021), who notes that leadership in the digital era requires a balance between encouraging innovation and maintaining control over the direction and scope of digital initiatives.

5.2.6.4 Balancing Regulatory Compliance with Innovation

An important aspect of governance and oversight is balancing regulatory compliance with the pursuit of innovation. The dynamic nature of digital technologies often presents challenges in aligning innovative practices with existing regulatory frameworks. As suggested by the study, governance structures need to be flexible and adaptable, allowing for innovation while ensuring that digital initiatives remain within the bounds of legal and ethical standards. This balance is critical for fostering a conducive environment for digital transformation that is both progressive and compliant.

5.2.6.5 Governance as an Enabler of Digital Transformation

Lastly, governance and oversight are not just control mechanisms but enablers of digital transformation. Effective governance provides clarity, direction, and support, facilitating the smooth implementation of digital initiatives. It helps in embedding digital transformation into the organizational fabric, ensuring that it becomes an integral part of the operational and strategic framework. This perspective is supported by Danielle and Masilela (2020), who argue that governance can act as a catalyst for change, driving the adoption and integration of digital technologies in the public sector.

The findings on governance and oversight emphasize their fundamental role in the digital transformation process. Effective governance and oversight mechanisms are essential for ensuring that digital initiatives are successfully implemented, aligned with strategic objectives, and conducted in a transparent and accountable manner.

5.3 Linkage to Research Objectives and Questions

This section of the report systematically links the findings and discussions of the previous sections to the research objectives and questions outlined at the beginning of the study. This linkage is pivotal for evaluating the extent to which the research has effectively addressed its set goals and answered the proposed questions.

5.3.1 Addressing the Research Objectives

The study methodically addressed each of the proposed research objectives, drawing from the findings to provide a comprehensive understanding of digital transformation in the Gauteng province's public sector. The following sections detail how each objective has been met.

5.3.1.1 Objective 1: Identify key challenges in implementing digital transformation within the Gauteng province's public sector.

The research has successfully identified a range of challenges, including infrastructural limitations, cultural resistance to change, and policy complexities. These challenges align with Tangi et al. (2021) findings on infrastructural barriers and Manda and Ben Dhaou (2019) observations on cultural and behavioural challenges in technology adoption. This objective has been met by providing a detailed analysis of these multifaceted challenges.

5.3.1.2 Objective 2: Examine factors impeding digital transformation in the South African public sector, including infrastructure, digital literacy, privacy, security, and policy issues.

The study explored various factors hindering digital transformation, such as infrastructure inadequacies, digital literacy gaps, and policy and regulatory hurdles. This examination aligns with the work of Manana and Mawela (2022), who highlighted digital literacy as a critical barrier. The research also delved into privacy and security concerns, echoing the growing focus on these areas in the digital era.

5.3.1.3 Objective 3: Explore opportunities and benefits of digital transformation in the South African public sector, focusing on service delivery, citizen engagement, and operational efficiency.

The findings reveal significant opportunities and benefits, such as improved service delivery, enhanced citizen engagement, and increased operational efficiency. This aligns with Lindgren et al. (2021) discussion on the transformative impact of digitalization in public services. The research has comprehensively explored these aspects, fulfilling this objective.

5.3.1.4 Objective 4: Assess the impact of digital transformation on addressing systemic issues and promoting economic growth and sustainable development.

The study assessed the impact of digital transformation on systemic issues, finding that it can significantly contribute to addressing bureaucratic inefficiencies and promoting socio-economic development. This finding resonates with Danielle and Masilela (2020) perspective on the role of digital initiatives in enhancing governance and aligns with broader developmental goals.

5.3.1.5 Objective: Provide recommendations for policymakers and stakeholders on effective strategies for leveraging digital transformation opportunities in the South African public sector.

The research offers concrete recommendations, including the need for robust infrastructure, comprehensive policy reforms, and focused skills development. These suggestions are informed by the identified challenges and opportunities and are aimed at guiding effective digital transformation strategies (Criado & Gil-Garcia, 2019).

The study successfully addresses each of the research objectives, providing a detailed understanding of the complexities and nuances of digital transformation in the South African public sector. The findings offer valuable insights for policymakers, stakeholders, and the academic community, contributing significantly to the field of digital transformation.

5.3.2 Addressing the Research Questions

The study meticulously addresses the proposed research objectives, providing in-depth insights into the digital transformation landscape within the Gauteng province's public sector. The discussion below elaborates on how each objective has been comprehensively met through the research findings.

5.3.2.1 What challenges are faced in implementing digital transformation in the Gauteng province's public sector?

The study identified several key challenges impeding digital transformation, including infrastructural limitations, policy and regulatory complexities, and cultural resistance to change. These findings are in line with Tangi et al. (2021) observations about the infrastructural barriers in public sector digitalization. Additionally, the study's emphasis on policy complexities echoes Cloete (2023), who noted that bureaucratic intricacies often hinder technological advancement. Furthermore, the resistance to change within organizations, a

significant theme in the findings, aligns with Ramogayane (2022) discussion on cultural and behavioural challenges in adopting new technologies.

5.3.2.2 What factors hinder successful digital transformation in the South African public sector?

The study found that organizational resistance, financial limitations, and the digital skills gap are the primary factors hindering successful digital transformation. This aligns with Manana and Mawela (2022) research, highlighting the critical role of digital literacy in achieving digital inclusivity. The financial constraints identified in the study also correspond to the broader narrative in public sector innovation, where budget limitations are often cited as a major obstacle to adopting and implementing new technologies.

5.3.2.3 What opportunities and benefits does digital transformation offer in the South African public sector?

The research uncovered significant opportunities and benefits, including improved service delivery, increased operational efficiency, and enhanced citizen engagement. These findings are supported by Carcary, Doherty and Conway (2016) assertions on the transformative impact of digitalization in public services. The study demonstrates that digital transformation holds considerable potential for revolutionizing public services and enhancing the efficiency and responsiveness of the public sector.

5.3.2.4 How does digital transformation impact the sector's ability to address systemic issues and promote development?

The findings indicate that digital transformation initiatives can significantly address systemic challenges in the public sector, thereby contributing to socio-economic development. This aligns with Manana and Mawela (2022) perspective on the role of digital initiatives in enhancing governance and furthering developmental goals. The study provides an in-depth assessment of how digital transformation can facilitate more efficient, transparent, and accountable governance, thereby impacting broader developmental objectives.

5.3.2.5 What recommendations can be made to policymakers and stakeholders for effective digital transformation in the South African public sector?

Drawing from the identified challenges and opportunities, the research offers strategic recommendations for policymakers and stakeholders. These include prioritizing infrastructure development, reforming policy frameworks, enhancing digital literacy, and establishing robust governance and oversight mechanisms. These recommendations are tailored to address the

specific needs and challenges identified in the study, providing a roadmap for effective and sustainable digital transformation strategies.

In summary, the study's findings provide in-depth answers to the research questions, offering a comprehensive understanding of the dynamics of digital transformation in the Gauteng province's public sector. The insights gained contribute significantly to both academic knowledge and practical implications for policymakers and stakeholders engaged in digital transformation.

5.4 Theoretical and Practical Implications

In this section, the focus is on elucidating the theoretical and practical implications arising from the study's findings on digital transformation within the Gauteng province's Department of E-Government. The discussion centres on how the research contributes to and expands upon existing theoretical frameworks in the field of digital transformation and examines the practical applications and actionable insights that can be derived from the study.

5.4.1 Contributions to Theoretical Knowledge

The study on digital transformation within the Gauteng province's Department of E-Government significantly contributes to the theoretical knowledge in the field of digital governance. This section explores how the findings enrich existing theories and models related to digital transformation.

5.4.1.1 Enhancing Understanding of Digital Transformation Theories

The research provides nuanced insights into the challenges and opportunities of digital transformation, thereby enhancing the understanding of existing theories in this domain. The study's exploration of infrastructural, policy, and cultural challenges adds depth to the theoretical framework, illustrating the complex and multifaceted nature of digital transformation in the public sector. This aligns with and expands upon the theoretical perspectives presented in existing literature, such as Eggers and Bellman (2015) discussions on the intricacies of digital transformation.

5.4.1.2 Addressing Gaps in Digital Transformation Literature

The study addresses notable gaps in the digital transformation literature, especially in the context of developing regions like South Africa. By providing empirical evidence and detailed analysis, the research contributes to a more comprehensive understanding of the interplay between technological, organizational, and socio-political factors in digital transformation.

This is particularly significant in contributing to the body of knowledge on how digital transformation is navigated within the unique socio-political context of Africa.

5.4.1.3 Applying and Validating Theoretical Models

The study's findings also offer an opportunity to apply and validate theoretical models in the context of digital transformation. Frameworks such as the Technology Acceptance Model (TAM) and Diffusion of Innovations Theory are examined in light of the empirical data, providing a practical test of these models. The analysis of factors such as perceived usefulness and ease of use (as per TAM) or the role of early adopters and communication channels (as per Diffusion of Innovations Theory) in the context of the Gauteng Department highlights the applicability and relevance of these theories in real-world settings.

5.4.1.4 Contributing to Socio-Technical Theories

The findings also contribute to socio-technical theories, which emphasize the interaction between social and technical aspects of technology adoption and implementation. The research highlights how technological changes in digital governance are intertwined with social factors such as organizational culture, employee attitudes, and policy environments, reinforcing the notion that successful digital transformation requires a holistic approach that considers both technical and social dimensions.

In essence, the study not only reaffirms certain aspects of existing theories in digital transformation but also provides new insights and perspectives, particularly in the context of the South African public sector. These contributions are invaluable in advancing theoretical understanding and guiding future research in the field of digital governance.

5.4.2 Practical Implications for Stakeholders

The practical applications and implications of the study's findings on digital transformation within the Gauteng province's Department of E-Government extend significantly to various stakeholders. This section explores the real-world impact and actionable insights that can be drawn from the research, offering guidance and recommendations for practitioners, policymakers, and other relevant stakeholders in the realm of digital governance.

5.4.2.1 Informing Policy and Strategic Decision Making

The study provides critical insights that can inform the development of more effective digital transformation policies and strategies. Policymakers can utilize the findings to address specific challenges such as infrastructural development, policy framework adjustments, and digital

literacy initiatives. These insights align with the recommendations of Patel and Joseph (2019), emphasizing the need for policies that are responsive to the technological and cultural realities of the public sector.

5.4.2.2 Enhancing Public Sector Operations

The findings offer valuable lessons for enhancing operational efficiency, service delivery, and citizen engagement in the public sector. Practitioners can leverage the identified opportunities to improve the delivery of public services and to foster a more interactive and responsive relationship with citizens. This practical application resonates with the approaches of countries like Estonia and Singapore, which have successfully integrated digital solutions into public service delivery (Lopes & Dhaou, 2018).

5.4.2.3 Addressing Implementation Challenges

The study sheds light on common implementation challenges in digital projects, offering strategies for overcoming these obstacles. IT professionals and project managers can apply these findings to anticipate and mitigate issues related to infrastructure, cultural resistance, and policy alignment, thus enhancing the success rate of digital transformation initiatives.

5.4.2.4 Facilitating Stakeholder Engagement and Collaboration

The research highlights the importance of stakeholder engagement and collaboration in the digital transformation process. It encourages stakeholders to collaborate across different sectors and levels of government to share knowledge, resources, and best practices. This collaborative approach is crucial in tackling the multifaceted challenges of digital transformation and in harnessing its full potential.

5.4.2.5 Guiding Sustainable Development and Inclusive Growth

The study's implications extend to sustainable development and inclusive growth, particularly relevant for development agencies and NGOs. The findings emphasize how digital transformation can contribute to socio-economic development goals, offering pathways to bridge the digital divide and to foster equitable access to government services.

In summary, the practical applications and implications of this study are diverse and far-reaching. They provide actionable guidance for various stakeholders involved in digital transformation, from policymakers to practitioners, and contribute to the effective implementation and advancement of digital governance initiatives.

5.5 Limitations of the Study

5.5.1 Geographical Scope

A primary limitation of this study was its geographical confinement to the Gauteng province of South Africa. While this focus allowed for an in-depth exploration specific to this region, it may limit the applicability of the findings to other regions with different socio-economic and technological contexts.

5.5.2 Sample Size and Diversity

The study relied on a limited number of participants from the Gauteng province's Department of e-Government. Although these participants offered valuable perspectives, a broader sample size encompassing a more diverse range of stakeholders could have provided a more comprehensive view of the digital transformation landscape.

5.5.3 Methodological Approach

The study's qualitative approach, focusing on interviews and document analysis, provided rich, detailed data. However, this approach inherently carries subjective interpretations and may not encompass the full spectrum of experiences and perspectives that quantitative methods or a mixed-methods approach could have captured.

5.5.4 Temporal Constraints

Conducted within a specific timeframe, the study represents a temporal snapshot of the digital transformation process. Given the dynamic nature of digital transformation, the findings might not fully capture future developments or long-term trends in this rapidly evolving field.

5.5.5 Focus on Specific Themes

While the study concentrated on critical themes like infrastructure, policy, and literacy, other influential factors such as political dynamics, economic conditions, and cultural attitudes were less explored. This thematic focus might have overlooked other relevant aspects impacting digital transformation.

5.5.6 Rapid Technological Changes

The fast-paced evolution of technology poses a limitation, as some findings related to specific technologies or platforms may quickly become outdated. The study's focus on the technologies and practices prevalent at the time of research might not adequately reflect imminent technological advancements.

These limitations highlight the specific context and constraints under which this study was conducted. They underline the importance of cautious interpretation of the findings and suggest directions for future research, which could include expanding the geographical scope, diversifying the participant base, utilizing mixed methodologies, and exploring a broader range of themes and emerging technologies.

5.6 Chapter Summary

Chapter 5 offered a thorough and systematic analysis of the findings, placing them within the larger framework of digital transformation in the public sector of Gauteng province. This chapter was instrumental in addressing the research questions posed at the outset, elucidating both the significant challenges and the potential opportunities inherent in the digital transformation process.

The chapter delved into various challenges impeding digital transformation, such as infrastructural limitations and policy complexities. These challenges were not only identified but also critically analysed in the context of their impact on the public sector's digital transformation initiatives. Furthermore, the chapter illuminated the opportunities presented by digital transformation, notably improved service delivery, and enhanced operational efficiency. These opportunities were contextualized within the broader goals of the public sector, underscoring their potential to revolutionize public service delivery and governance.

A significant contribution of this chapter was its detailed exploration of the practical implications of the study's findings. It offered targeted recommendations for policymakers and stakeholders, emphasizing the need for robust strategies and initiatives to leverage the benefits of digital transformation effectively. The chapter underscored the importance of strategic planning, leadership commitment, and stakeholder engagement as pivotal elements for successful digital governance. These recommendations were positioned as instrumental in guiding future actions and shaping effective digital transformation policies within the public sector.

In recognizing the study's limitations, the chapter highlighted the need for a cautious interpretation of the findings. The focus on Gauteng province, while providing in-depth insights, also limits the generalizability of the findings to other contexts. Additionally, the participant pool, though diverse, might not fully represent the wide range of perspectives within

the public sector. The chapter suggested future research avenues, such as expanding the geographical scope of the study, diversifying the participant pool further, and exploring additional thematic areas. These recommendations for future research aim to build upon the current study's findings, offering a more holistic understanding of digital transformation across different contexts.

Chapter 5 stands as a comprehensive and critical discussion of the study's findings, offering valuable insights into the challenges and opportunities of digital transformation in the Gauteng province's public sector. It provides a foundation for informed policy-making and strategic planning while highlighting the need for continued research in this dynamic and evolving field.

CHAPTER 6: CONCLUSION

6.1 Introduction

This chapter culminates the research study, which embarked on exploring the intricacies of digital transformation in the Gauteng province's public sector. It aims to consolidate the insights gathered, presenting key recommendations, and drawing a conclusion based on the findings. The chapter intends to provide actionable strategies for policymakers, stakeholders, and practitioners within the field of digital governance and to suggest directions for future research.

6.2 Summary of Key Findings

The study unveiled several critical findings regarding the challenges and opportunities of digital transformation within the South African public sector. Key challenges identified included infrastructural limitations, policy complexities, and cultural resistance to digital changes. Conversely, significant opportunities such as improved service delivery, enhanced citizen engagement, and increased operational efficiency were also highlighted. The theoretical and practical implications of these findings were extensively discussed in the previous chapters, providing a comprehensive understanding of the dynamics involved in digital transformation.

6.3 Recommendations

Based on the findings and discussions from the study on digital transformation in the Gauteng province's Department of E-Government, the following recommendations are proposed to guide stakeholders, policymakers, and practitioners in the public sector.

6.3.1 Strategic Infrastructure Development

This study highlights the pivotal role of strategic infrastructure development as an essential bedrock for the successful realization of digital transformation within the public sector in the Gauteng province. It advocates for a comprehensive and multifaceted approach, intricately designed to address the diverse aspects of digital advancement. This includes not only the enhancement of digital connectivity through the expansion and modernization of internet infrastructure but also a significant upgrade of existing technology systems to meet contemporary digital governance demands.

The study further stresses the critical importance of fostering widespread digital literacy and skill development, recognizing these as key drivers in enabling the workforce and the public to

adeptly navigate and utilize digital platforms. Additionally, the implementation of robust and resilient cybersecurity measures is underscored as a necessity in safeguarding the integrity of digital infrastructures against emerging cyber threats. Moreover, the study encourages proactive engagement with innovation and the integration of emerging technologies, viewing these as vital catalysts for transforming public sector services and operations. Collectively, these elements form a holistic strategy, aiming to elevate the digital infrastructure of Gauteng's public sector to a level where it can effectively support and sustain the dynamic landscape of digital transformation.

To address the infrastructural limitations, it is recommended that the government invest in upgrading technological infrastructure across all public sector departments. This includes ensuring reliable internet connectivity, modernizing outdated systems, and implementing robust cybersecurity measures. A strategic infrastructure plan should prioritize regions and departments most in need of technological enhancements to ensure equitable access to digital services.

6.3.2 Policy Reform and Regulatory Adaptation

Considering the rapidly evolving landscape of digital transformation and its profound impact on the public sector, this study emphatically highlights the critical need for policy reform and regulatory adaptation. It underscores that the Department of E-Government in the Gauteng province, along with analogous entities, stands at a pivotal juncture where revisiting and reshaping existing policies and regulatory frameworks is not just beneficial but imperative. This adaptation is essential to align with the fast-paced advancements in digital technologies and the shifting paradigms of digital governance.

The study advocates for a proactive approach in policymaking, one that not only responds to the current trends in digital transformation but also anticipates future developments. This forward-thinking perspective in policy formulation and regulatory practices will enable the Gauteng province's Department of E-Government, and similar organizations, to create an environment that is conducive to innovation, responsive to technological advancements, and resilient to the challenges posed by an ever-changing digital domain. Such strategic policy reform and regulatory adaptation are crucial in harnessing the full potential of digital transformation, thereby facilitating a more efficient, transparent, and citizen-centric public sector.

The study therefore emphasizes the need for policy reforms to create a more conducive environment for digital transformation. This includes revising existing policies and regulations to reduce bureaucratic hurdles and promote innovation. Policies should also be adaptive to the rapid advancements in technology, ensuring that they do not become obsolete quickly. Furthermore, the establishment of a regulatory framework that supports interoperability between different government systems is crucial.

6.3.3 Enhancement of Digital Literacy and Skills

The effective advancement of digital literacy and skills stands as a cornerstone for the triumph of digital transformation initiatives within the public sector. This study brings to the forefront the critical need for concentrated and strategic efforts aimed at bolstering the digital competencies not only of the workforce within the Gauteng province's public sector but also of the wider community it serves. Recognizing the rapidly evolving digital landscape, the study underscores the imperative of equipping both public sector employees and the general populace with the necessary skills and knowledge. This dual focus is essential to navigate, adapt, and effectively harness the opportunities presented by digital technologies. By elevating the digital acumen of the workforce alongside that of the citizenry, the study advocates for a comprehensive approach to building a digitally literate and capable society, thereby laying a solid foundation for a successful and inclusive digital transformation journey in the Gauteng province.

Improving digital literacy among public sector employees is essential for the successful implementation of digital transformation initiatives. This can be achieved through comprehensive training programs and continuous professional development. The government should collaborate with educational institutions and private sector partners to develop tailored training modules that address the specific needs of public sector employees. Additionally, creating a culture of continuous learning and innovation within public sector organizations will help sustain digital transformation efforts.

6.3.4 Inclusive Stakeholder Engagement

This study profoundly underscores the indispensable role of inclusive stakeholder engagement as a key driver for the successful execution of digital transformation initiatives within the public sector. It casts a spotlight on the Gauteng province's Department of E-Government, exemplifying how vital it is to integrate diverse perspectives and inputs across the spectrum of

stakeholders. Such comprehensive engagement is pivotal in ensuring that digital transformation efforts are not only in harmony with but also actively cater to the multifaceted needs and expectations of a broad array of stakeholders. These include not just the government employees and various departments who are at the frontline of implementing these changes, but also, and perhaps most critically, the citizens who stand to be the ultimate beneficiaries of enhanced digital services.

This inclusive approach is crucial for fostering a sense of collective ownership, ensuring that digital initiatives are not only technically sound but also resonate with and are embraced by the entire community they are meant to serve. By embracing this ethos of inclusivity, the Department of E-Government can create digital solutions that are more effective, user-centric, and sustainable, ultimately leading to more efficient public service delivery and a more engaged citizenry.

Inclusive stakeholder engagement is critical for overcoming cultural resistance to change and ensuring the success of digital transformation projects. It is recommended that the government involve all relevant stakeholders, including employees, citizens, and private sector partners, in the planning and implementation of digital initiatives. This can be facilitated through regular consultations, workshops, and feedback mechanisms that allow stakeholders to contribute their perspectives and insights.

6.3.5 Robust Monitoring and Evaluation Mechanisms

This study emphatically stresses the critical importance of establishing robust monitoring and evaluation (M&E) mechanisms within the framework of digital transformation projects in the public sector. With a specific focus on the Gauteng province's Department of E-Government, the study highlights how these M&E mechanisms are indispensable tools, not only for systematically tracking the progress of digital initiatives but also for thoroughly assessing their broader impact and effectiveness. The implementation of such mechanisms is vital for maintaining a transparent, accountable approach to digital transformation, ensuring that each initiative is closely aligned with its intended goals and is delivering tangible benefits. Furthermore, effective M&E practices are fundamental in fostering a culture of continuous improvement, allowing for the adaptation and refinement of digital strategies in response to evolving needs and challenges. By integrating these robust M&E systems, the Department of E-Government can significantly enhance its ability to navigate the complex landscape of digital

transformation, ensuring that its efforts are both impactful and sustainable, and ultimately leading to more efficient and responsive public service delivery.

The establishment of robust monitoring and evaluation mechanisms is necessary to track the progress and impact of digital transformation initiatives. Regular reviews and audits should be conducted to assess the effectiveness of implemented strategies and identify areas for improvement. This will ensure that digital projects remain aligned with organizational goals and deliver the intended benefits. Additionally, the government should develop a detailed audit trail documenting all coding decisions, theme development, and analytical procedures to enhance transparency and accountability.

6.4 Conclusion

In the realm of digital transformation within the public sector, the strategic development of infrastructure emerges as a critical catalyst. This study profoundly underscores that by comprehensively addressing key domains such as connectivity, technology systems, digital literacy, cybersecurity, and innovation, the Gauteng province's Department of E-Government is not merely laying down the groundwork but is actively forging a robust and resilient foundation for its digital transformation journey.

This multifaceted approach, deeply rooted in strategic planning and foresight, is indispensable for unleashing the full spectrum of capabilities inherent in digital governance. It is a commitment to not only enhancing the current operational framework but also to future-proofing the public sector against an ever-evolving digital landscape. By fortifying connectivity and modernizing technological infrastructures, the Department positions itself to navigate the digital era with greater agility and competence.

Moreover, the emphasis on cultivating digital literacy and skills across all levels ensures that the transformation transcends mere technological upgrades, embedding a culture of digital proficiency within the workforce. The integration of stringent cybersecurity measures addresses the paramount need for data integrity and security, fostering public trust and safeguarding against the increasing threats in the digital space.

Additionally, the encouragement of innovation and the adoption of emerging technologies signify a forward-thinking approach, one that is open to exploring new frontiers in digital

governance. It reflects a commitment to not only adapting to change but also leading it, positioning the Department as a trailblazer in digital transformation within the public sector.

In essence, the strategic development of infrastructure as outlined in this study is more than an operational necessity; it is a visionary stride towards realizing a digitally empowered public sector. This holistic strategy is instrumental in ensuring that the public sector of Gauteng province remains responsive, efficient, and secure, thereby effectively serving its community in an increasingly digital world.

LIST OF REFERENCES

- Abdullahi, A. A. (2016). Diffusion of innovation theory and adoption of e-government by medium business enterprises in Kenya: a case of Nairobi city county University of Nairobi].
- African Union. (2020). The Digital Transformation Strategy for Africa (2020-30).
- AGSA. (2023). The Role of the Auditor-General. https://www.agsa.co.za/Portals/0/Audit101/The_role_of_the_Auditor_General.pdf
- Ahn, M. J., & Chen, Y.-C. (2022). Digital transformation toward AI-augmented public administration: The perception of government employees and the willingness to use AI in government. *Government Information Quarterly*, 39(2), 101664.
- Al-Alawi, A. I., Abdulmohsen, M., Al-Malki, F. M., & Mehrotra, A. (2019). Investigating the barriers to change management in public sector educational institutions. *International Journal of Educational Management*, 33(1), 112-148.
- Alvarenga, A., Matos, F., Godina, R., & CO Matias, J. (2020). Digital transformation and knowledge management in the public sector. *Sustainability*, 12(14), 5824.
- Apleni, A., & Smuts, H. (2020). An e-government implementation framework: A developing country case study. *Responsible Design, Implementation and Use of Information and Communication Technology: 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, Skukuza, South Africa, April 6–8, 2020, Proceedings, Part II* 19,
- Armstrong, C. (2020). Key methods used in qualitative document analysis.
- Asogwa, B. E. (2013). Electronic government as a paradigm shift for efficient public services: Opportunities and challenges for Nigerian government. *Library Hi Tech*, 31(1), 141-159.
- Bala, M. Y. (2022). Strategies to Implement a Change Management Process for Public Sector Management in Nigeria [Walden University].
- Bannister, F., & Connolly, R. (2014). ICT, public values and transformative government: A framework and programme for research. *Government information quarterly*, 31(1), 119-128.
- Bellantuono, N., Nuzzi, A., Pontrandolfo, P., & Scozzi, B. (2021). Digital transformation models for the I4. 0 transition: Lessons from the change management literature. *Sustainability*, 13(23), 12941.

Bertot, J., Estevez, E., & Janowski, T. (2016). Universal and contextualized public services: Digital public service innovation framework. In (Vol. 33, pp. 211-222): Elsevier.

Bertot, J. C., Estevez, E., & Janowski, T. (2016). Digital public service innovation: Framework proposal. Proceedings of the 9th International Conference on Theory and Practice of Electronic Governance,

Blom, P., & Uwizeyimana, D. (2020). Assessing the effectiveness of e-government and e-governance in South Africa: During national lockdown 2020.

Bullock, M. M. (2022). Change management during digital transformation projects: How to overcome barriers using an agile approach and modern change models.

Carcary, M., Doherty, E., & Conway, G. (2016). A dynamic capability approach to digital transformation: a focus on key foundational themes. The European Conference on Information Systems Management,

Cardullo, P., Di Feliciano, C., & Kitchin, R. (2019). The Right to the Smart City. In: Emerald Publishing Limited.

Chantillon, M. (2021). A governance framework facilitating a digital transformation of the public administration.

Chen, L., & Aklikokou, A. K. (2020). Determinants of E-government adoption: testing the mediating effects of perceived usefulness and perceived ease of use. *International Journal of Public Administration*, 43(10), 850-865.

Chigova, L. E. (2021). The National Development Plan 2030: A Focus on Innovation Issues. *Journal of Public Administration*, 56(4.1), 1069-1073.

Cloete, F. (2023). Transition from Paper-based Analogue Government to Sustainable Digital Governance Outcomes in Africa. *Administratio Publica*, 31(2), 70-90.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design : choosing among five approaches* (Fourth edition. ed.). SAGE.

Criado, J. I., & Gil-Garcia, J. R. (2019). Creating public value through smart technologies and strategies: From digital services to artificial intelligence and beyond. *International Journal of Public Sector Management*, 32(5), 438-450.

Danielle, N., & Masilela, L. (2020). Open governance for improved service delivery innovation in South Africa. *International Journal of eBusiness and eGovernment Studies*, 12(1), 33-47.

Daub, M., Domeyer, A., Lamaa, A., & Renz, F. (2020). Digital public services: How to achieve fast transformation at scale. McKinsey and Company.

Davis, F. D. (1989). Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption, 205-219.

De Vera, K., Challa, P., Liu, R. H., Fuller, K., Feroz, A. S., Gamble, A., Leung, E., & Seto, E. (2022). Virtual primary care implementation during COVID-19 in high-income countries: a scoping review. *Telemedicine and e-Health*, 28(7), 920-931.

Deloitte, & David, T. (2022). SARS' next digital transformation move: Real-time access to organisations' data will reduce the administrative burden for the taxpayer and increase compliance. <https://www.deloitte.com/za/en/services/tax/perspectives/what-is-sars-next-digital-transformation-move.html>

Demir, E., & Kocaoglu, B. (2019). The use of McKinsey's 7S framework as a strategic planning and economic assessment tool in the process of digital transformation. *PressAcademia Procedia*, 9(1), 114-119.

Dener, C., Nii-Aponsah, H., Ghunney, L. E., & Johns, K. D. (2021). GovTech maturity index: The state of public sector digital transformation. World Bank Publications.

Department of National Treasury. (2010). Public Sector Risk Management Framework. Pretoria Retrieved from file:///C:/Users/Tech/Downloads/01.%20Condensed%20Public%20Sector%20Risk%20Management%20Framework.pdf

Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., & Prashant, P. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management*, 55, 102211.

Eggers, W., & Bellman, J. (2015). Digital government transformation. The journey to government's digital future. In: Deloitte University Press.

Elsafty, A., & Yehia, A. (2023). Digital Transformation Challenges for Government Sector. *Business and Management Studies*, 9(1), 11.

Feroz, A. K., Zo, H., & Chiravuri, A. (2021). Digital transformation and environmental sustainability: A review and research agenda. *Sustainability*, 13(3), 1530.

Flick, U. (2015). *Introducing research methodology: A beginner's guide to doing a research project*. Sage.

Flick, U. (2018). *The Sage handbook of qualitative data collection*. Sage Reference.
<https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1666998>

Gauteng Department of e-Government. (2021). *Gauteng Department of e-Government Strategic Plan 2020-2025*. Johannesburg: Government Gazette

Gauteng Provincial Legislature. (2022). *Department of e-Government - 2021/22 Annual Report*. Johannesburg: Government Gazette Retrieved from https://www.gpl.gov.za/wp-content/uploads/2022/09/e-Government-2021_2022-Annual-Reports.pdf

Gil-Garcia, J. R., Pardo, T. A., & Gasco-Hernandez, M. (2020). *Internet of Things and the public sector*. Springer.

Gill, M., & VanBoskirk, S. (2016). *The digital maturity model 4.0. Benchmarks: digital transformation playbook*.

Guenduez, A. A., & Mergel, I. (2022). The role of dynamic managerial capabilities and organizational readiness in smart city transformation. *Cities*, 129, 103791.

Gupta, M., Shaheen, M., & Reddy, K. P. (2018). *Qualitative techniques for workplace data analysis*. IGI Global.

Hennig, T. M. (2024). *Leading digital transformation changes within an organization using change framework models-a systematic literature*.

Hujran, O., Alarabiat, A., Al-Adwan, A. S., & Al-Debei, M. (2023a). Digitally transforming electronic governments into smart governments: SMARTGOV, an extended maturity model. *Information Development*, 39(4), 811-834.

Hujran, O., Alarabiat, A., & AlSuwaidi, M. (2023b). Analysing e-government maturity models. *Electronic Government, an International Journal*, 19(1), 1-21.

Iphofen, R., & Tolich, M. (2018). *The SAGE handbook of qualitative research ethics*. Sage.

ITWeb. (2023). *Top ICT tenders: Home affairs looks to business continuity*.
<https://www.itweb.co.za/article/top-ict-tenders-home-affairs-looks-to-business-continuity/G98YdMLG3LA7X2PD>

- ITWeb. (2024). Cyber criminals target SA's CIPC business registry. Retrieved 02 July 2024, from <https://www.itweb.co.za/article/cyber-criminals-target-sas-cipc-business-registry/VgZeyqJlN2X7djX9>
- Jakoet-Salie, A. (2020). E-government Strategies in South Africa. *Administratio Publica*, 28(3), 1-22.
- Kamnqa, S. (2021). How drones are used in SA's health services. Retrieved 02 July 2024, from <https://www.spotlightnsp.co.za/2021/04/26/how-drones-are-used-in-sas-health-services/>
- Kanyemba, D., & Hofisi, C. (2019). e-Government innovation for improved service delivery. *Journal of Public Administration*, 54(2), 207-222.
- Kariem, I. (2021). A digital skills development framework for digitally maturing South African Higher Education Institutions.
- Kattel, R., & Takala, V. (2021). Dynamic capabilities in the public sector: the UK Government Digital Service case. UCL (IIPP WP 2021 p. 01).
- Kitsios, F., Kamariotou, M., & Mavromatis, A. (2023). Drivers and outcomes of digital transformation: The case of public sector services. *Information*, 14(1), 43.
- Kotter, J. P. (1996). *Leading Change*, Harvard Business School Press, Boston. Search in.
- Kubheka, T. (2019). Lesufi Launches E-Learning Platform to Prep Learners For 4IR. Retrieved 20 October 2023, from <https://ewn.co.za/2019/10/11/lesufi-launches-e-learning-platform-to-prep-learners-for-4ir>
- Lindgren, I., Toll, D., & Melin, U. (2021). Automation as a driver of digital transformation in local government: Exploring stakeholder views on an automation initiative in a Swedish municipality. DG. O2021: The 22nd Annual International Conference on Digital Government Research,
- Lopes, N. V., & Dhaou, S. B. (2018). Public service delivery framework: Case of Canada, China and Estonia. *Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance*,
- Luna-Reyes, L., Juiz, C., Gutierrez-Martinez, I., & Duhamel, F. B. (2020). Exploring the relationships between dynamic capabilities and IT governance: Implications for local governments. *Transforming Government: People, Process and Policy*, 14(2), 149-169.

- Manana, T., & Mawela, T. (2022). Digital Skills of Public Sector Employees for Digital Transformation. 2022 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT),
- Manda, M. I. (2022). Power, politics, and the institutionalisation of information systems for promoting digital transformation in the public sector: A case of the South African's government digital transformation journey. *Information Polity*, 27(3), 311-329.
- Manda, M. I., & Backhouse, J. (2017). Digital transformation for inclusive growth in South Africa. Challenges and opportunities in the 4th industrial revolution. 2nd African conference on information science and technology, Cape Town, South Africa,
- Manda, M. I., & Backhouse, J. (2018). Inclusive digital transformation in South Africa: An institutional perspective. *Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance*,
- Manda, M. I., & Ben Dhaou, S. (2019). Responding to the challenges and opportunities in the 4th Industrial revolution in developing countries. *Proceedings of the 12th international conference on theory and practice of electronic governance*,
- Maremi, K., Thulare, T., & Herselman, M. (2022). The benefits of digital transformation addressing the hindrances and challenges of e-government services in South Africa: A scoping review. 2022 IST-Africa Conference (IST-Africa),
- Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government information quarterly*, 36(4), 101385.
- Meyerhoff Nielsen, M., & Jordanoski, Z. (2020). Digital transformation, governance and coordination models: A comparative study of Australia, Denmark and the Republic of Korea. *The 21st Annual International Conference on Digital Government Research*,
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative data analysis : a methods sourcebook* (Fourth edition. ed.). SAGE.
- Mkhatshwa, B., & Mawela, T. (2023). Cloud Computing Adoption in the South African Public Sector. *Indonesian Journal of Electrical Engineering and Informatics (IJEI)*, 11(2), 537-552.
- Mutula, S. M., & Mostert, J. (2010). Challenges and opportunities of e-government in South Africa. *The electronic library*.

National Planning Commission. (2020). Digital Futures: South Africa's Digital Readiness for the Fourth Industrial Revolution. South Africa: National Planning Commission.

News24, & Van der Post, J. (2022). SA's driving licence renewals now digital, but you still have to visit a testing centre. <https://www.news24.com/life/motoring/licences/sas-driving-licence-renewals-now-digital-but-you-still-have-to-visit-a-testing-centre-20220218-2>

Nzimakwe, T. (2021). Leading Digital Transformation and Innovation in Local Government Institutions in South Africa. *Administratio Publica*, 29(2).

Pandey, P., & Pandey, M. M. (2021). Research methodology tools and techniques. Bridge Center.

Pittaway, J. J., & Montazemi, A. R. (2020). Know-how to lead digital transformation: The case of local governments. *Government information quarterly*, 37(4), 101474.

Plantinga, P., & Adams, R. (2021). Rethinking open government as innovation for inclusive development: Open access, data and ICT in South Africa. *African Journal of Science, Technology, Innovation and Development*, 13(3), 315-323.

Ramogayane, R. (2022). Exploring Organisational Culture and Digital Transformation in the Public Sector University of Pretoria (South Africa)].

Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In *An integrated approach to communication theory and research* (pp. 432-448). Routledge.

Schwab, K. (2016). The Fourth Industrial Revolution, World Economic Forum. Secretaría de Economía (SE)(2012), Plan Nacional Estratégico de la Industria Aeroespacial.

Sigwejo, A., & Pather, S. (2016). A citizen-centric framework for assessing e-government effectiveness. *The Electronic Journal of Information Systems in Developing Countries*, 74(1), 1-27.

Sithole, T. G. (2019). Assessing resilience of public sector Information Systems against cyber threats and attacks. A South African perspective University of Pretoria].

South Africa. (2012). National Development Plan 2030. Pretoria: Government Gazette Retrieved from https://www.nationalplanningcommission.org.za/National_Development_Plan

South Africa. (2015a). National Cybersecurity Policy Framework. Pretoria: Government Gazette Retrieved from https://www.gov.za/sites/default/files/gcis_document/201512/39475gon609.pdf

South Africa. (2015b). Paperless Education project, which equips schools with digital tools and resources to enhance digital literacy and learning experiences Pretoria Retrieved from <https://www.gov.za/news/media-statements/gauteng-infrastructure-roll-out-paperless-classroom-system-21-jul-2015>

South Africa. (2017). National e-government strategy and roadmap. Pretoria: Government Gazette Retrieved from https://www.gov.za/sites/default/files/gcis_document/201711/41241gen886.pdf

South Africa. (2019). Gauteng Broadband Network (GBN). Retrieved from <https://www.gauteng.gov.za/Departments/DepartmentProjectDetails/%7BB153F649-7045-4206-9229-BF7F09D8A34F%7D?departmentId=CPM-001005>

South Africa. (2020). 2020 - 2025 Strategic Plan Pretoria: Government Gazette Retrieved from <https://www.dcdt.gov.za/documents/strategic-plans.html>

South Africa. (2022). War Rooms to fast-track service delivery. Gauteng Province Retrieved from <https://www.gauteng.gov.za/News/NewsDetails/%7BB11E30A6-C32A-4BB2-BAF0-CA14B0038696%7D>

South Africa. (2023a). The Innovation Hub's path to Gauteng's economic success. Gauteng Province Retrieved from <https://www.gauteng.gov.za/News/NewsDetails/%7B2ef7e0cc-3970-4aa1-b4fa-85c0ca49a6ac%7D>

South Africa. (2023b). Innovative solutions for e-government services; Interventions to improve the system downtime and impact on service delivery in the public sector; with Minister and Deputy Minister. Pretoria Retrieved from <https://pmg.org.za/committee-meeting/37557/>

Tangi, L., Janssen, M., Benedetti, M., & Noci, G. (2021). Digital government transformation: A structural equation modelling analysis of driving and impeding factors. *International Journal of Information Management*, 60, 102356.

The World Bank. (2019). South Africa Digital Economy Diagnostic. <https://documents1.worldbank.org/curated/en/464421589343923215/pdf/South-Africa-Digital-Economy-Diagnostic.pdf>

Trawick, S., & Carraher, T. (2023). Contextualising Kotter's 8-step model to a sustainable digital transformation: A qualitative study from the perspective of organisational change. In.

- United Nations. (2022). UN E-Government Survey 2022 - Public Institutions. <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2022>
- Van Haute, E. (2021). Sampling Techniques. *Research Methods in the Social Sciences: An AZ of Key Concepts*; Oxford University Press: Oxford, UK, 247.
- Van Veldhoven, Z., & Vanthienen, J. (2022). Digital transformation as an interaction-driven perspective between business, society, and technology. *Electronic Markets*, 32(2), 629-644.
- Velsberg, O., Westergren, U. H., & Jonsson, K. (2020). Exploring smartness in public sector innovation-creating smart public services with the Internet of Things. *European Journal of Information Systems*, 29(4), 350-368.
- Verina, N., & Titko, J. (2019). Digital transformation: conceptual framework. *Proc. of the Int. Scientific Conference “Contemporary Issues in Business, Management and Economics Engineering*,
- Villao, D., Vera, G., Duque, V., & Mazón, L. (2023). Opportunities and Challenges of Digital Transformation in the Public Sector: The Case of Ecuador. *International Conference on Computational Science and Its Applications*,
- Weerakkody, V., Janssen, M., & El-Haddadeh, R. (2021). The resurgence of business process re-engineering in public sector transformation efforts: exploring the systemic challenges and unintended consequences. *Information Systems and e-Business Management*, 1-22.
- Willie, M. M., & Nkomo, P. (2019). Digital transformation in healthcare–South Africa context. *Global Journal of Immunology and Allergic Diseases*, 7(1), 1-5.
- Willig, C. (2017). Interpretation in qualitative research. *The SAGE handbook of qualitative research in psychology*, 274-288.
- Wirtz, B., Langer, P., & Schmidt, F. (2021). Digital government: developing a business model for creating public value-a framework based on dynamic capabilities. *Public Adm. Q*, 45, 232-255.
- Zhang, Y., & Kimathi, F. A. (2022). Exploring the stages of E-government development from public value perspective. *Technology in Society*, 69, 101942.

APPENDICES

Appendix 1: Informed Consent Letter

UKZN GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

INFORMED CONSENT LETTER

Dear Participant

My name is **Nonduduzo Duma**, a **Master of Business Administration (MBA)** student at the **University of KwaZulu-Natal**, Westville Campus, Graduate School of Business and Leadership.

You are being invited to consider participating in a research study titled “**Investigating the Challenges and Opportunities of Implementing Digital Transformation in the South African Public Sector**”. The aim and purpose of this research is to investigate the current challenges and opportunities associated with digital transformation in the South African public sector. The study is expected to enroll 15 participants from the Department of e-Government in Gauteng Province. As a participant, you would be asked to engage in a semi-structured in-depth interview, which is expected to last approximately 30 minutes.

The study is not intended to provide direct benefits to the participants. However, it is hoped that the research will contribute valuable insights into the field of digital governance, potentially informing future policies and strategies. I also want to assure you that your participation in this study is completely voluntary, and you are free to withdraw at any time without any repercussions.

It's important to note that there might be risks or discomforts associated with discussing professional experiences and opinions. However, all information will be treated with the strictest confidentiality, and measures will be in place to ensure your privacy is respected.

This research has been reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee, (approval number **HSSREC.00006092/2023**).

In the event of any problems or concerns/questions you may contact the researcher at (provide contact details) or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban , 4000

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

I sincerely hope you will consider participating in this important study.

Thank you for considering this invitation.

Sincerely,

Nonduduzo Duma

MBA Student | University of KwaZulu-Natal, Westville Campus - Graduate School of Business and Leadership | 213567166@stu.ukzn.ac.za

Appendix 2: Consent to Participate in Research

Consent to Participate in Research

CONSENT (Edit as required)

I (Name) have been informed about the study entitled “**Investigating the Challenges and Opportunities of Implementing Digital Transformation in the South African Public Sector**”, conducted by Nonduduzo Duma, an MBA candidate from UKZN, Graduate School of Business and Leadership

I understand the purpose and procedures of the study.

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

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

If I have any further questions/concerns or queries related to the study I understand that I may contact Nonduduzo on 213567166@stu.ukzn.ac.za.

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

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

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion	YES / NO
Video-record my interview / focus group discussion	YES / NO
Use of my photographs for research purposes	YES / NO

Signature of Participant

Date

Signature of Witness
(Where applicable)

Date

Signature of Translator
(Where applicable)

Date

Appendix 3: Questionnaires

UNIVERSITY OF KWAZULU-NATAL Graduate School of Business and Leadership

INTERVIEWEE NAME		CONDUCTED BY (INTERVIEWER)	
INTERVIEW DATE		INTERVIEW START AND END TIME	LOCATION
POSITION TITLE		DEPARTMENT/SECTION	
RESEARCH TITLE			
Investigating the Challenges and Opportunities of Implementing Digital Transformation in the South African Public Sector			

INTRODUCTION

I am *Nonduduzo Duma*, a researcher from *University of Kwazulu Natal*, is conducting a research study to understand the challenges and opportunities of implementing digital transformation in the South African public sector. This interview will take approximately [duration] and will be recorded for accuracy. Please remember that your participation is voluntary, and you can choose not to answer any question or discontinue the interview at any time.

INTERVIEW QUESTIONS

SECTION A: GENERAL (15 MINS)
Can you please describe your role and responsibilities in the Department of e-Government in Gauteng?
<ul style="list-style-type: none"> Could you provide examples of how your role contributes to digital transformation initiatives?
What specific projects or initiatives has the Department of e-Government undertaken to digitize the public sector in Gauteng?
<ul style="list-style-type: none"> Could you highlight a project you feel was particularly successful and explain why you think so? Were there any projects that didn't go as planned? If so, could you share what happened?
Could you discuss the key objectives and intended outcomes of these digital transformation initiatives?
<ul style="list-style-type: none"> How were these objectives determined? Were there any objectives that evolved or changed as the project progressed?

What impact have these digital transformation initiatives had on public service delivery, citizen engagement, and operational efficiency in Gauteng?
<ul style="list-style-type: none"> • Can you share some specific examples of these impacts? • How were these impacts measured or evaluated? • How have these impacts been received by citizens or other stakeholders?

SECTION B: CHALLENGES (15mins)
What major challenges has the Department of e-Government encountered in implementing digital transformation initiatives?
<ul style="list-style-type: none"> • Can you provide a specific example of a project where these challenges were particularly pronounced? • How did the Department manage or mitigate these challenges?
How have issues related to technological infrastructure, digital literacy, policy, and regulation influenced digital transformation efforts in Gauteng?
<ul style="list-style-type: none"> • Are there any specific policies or regulations that have particularly impacted these efforts? How so? • Can you discuss any initiatives or strategies adopted to improve digital literacy among the public or within the Department?
Can you discuss how the Department addresses privacy and security concerns in its digital transformation efforts??
<ul style="list-style-type: none"> • Can you give an example of a situation where these concerns were particularly significant and how they were managed? • How does the Department ensure that its digital services comply with data protection regulations?

SECTION C: OPPORTUNITIES (15mins)

What opportunities has digital transformation brought to the Department of e-Government and the Gauteng public sector more broadly?

- Can you share a specific instance where these opportunities were realized?
- Have these opportunities brought about any unexpected benefits or outcomes?

How has digital transformation affected the delivery of public services in Gauteng?

- Can you share any specific examples or data that illustrate these effects?
- How have citizens responded to these changes in service delivery?

How do you envision the future of the Department of e-Government in Gauteng given the current pace of digital transformation?

- What role do you see emerging technologies playing in this future?
- How is the Department planning or preparing for this future?

Appendix 4: Ethical Clearance



07 December 2023

Nonduduzo Nozipho Lawrence Duma (213567166)
Grad School of Bus & Leadership
Westville Campus

Dear NNL Duma,

Protocol reference number: HSSREC/00006092/2023

Project title: Investigating the challenges and opportunities of implementing digital transformation in the South African public sector

Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 30 August 2023 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 07 December 2024.

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

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

Yours sincerely,




Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 250 8330/4557/3587 Email: hssrec@ukzn.ac.za Website: <http://research.ukzn.ac.za/Research-Ethics>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

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