



**Digital leadership, innovative work behaviour,
and service quality in a selected South African
government department**

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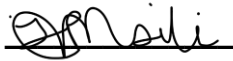
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DECLARATION

I, **Thandeka Patience Msibi (49751360)**, hereby declare that the research reported on this mini-dissertation entitled ***Digital Leadership, Innovative Work Behaviour and Service Quality in a selected South African Government Department*** is my own original work and any source used in the study has been acknowledged by means of references.



SIGNED

05 December 2025

DATE

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DEDICATION

This dissertation is dedicated to my late mother, Thembi Msibi, for laying the educational foundation for my life. To my two daughters, Nobuhle and Luthando, thank you for being a support structure while I consumed a lot of family time during my studies. The moral support that you provided is unimaginable. This serves as a foundation for you that education is a continuous journey in your entire life. I hope this work will motivate my niece, Olwethu Ntuli, to keep working hard and attain many degrees and one day be recognised as a Doctor through a PhD. Lastly, I would like to thank Ndabezitha for inspiring and motivating me to pursue my Master's degree studies.

ABSTRACT

The rapid digitalisation of the public sector has created an urgent need for leaders who can guide organisations through continuous technological change. Within this environment, digital leadership has become increasingly important for improving service efficiency, strengthening innovation, and enabling employees to adapt to evolving ICT systems. Although digital transformation is advancing across government institutions globally, limited empirical work has examined how digital leadership shapes innovative work behaviour and service quality in the South African public sector. This study addresses this gap by exploring these relationships within the Department of Public Works and Infrastructure. Anchored in the Job Demands–Resources Theory and Social Exchange Theory, the research adopted a quantitative design and collected data from 161 employees using an online structured questionnaire. Statistical analysis included descriptive measures, correlation testing, regression analysis and mediation testing. The findings indicate that digital leadership significantly predicts employees' innovative work behaviour. The results further show that innovative work behaviour has a positive effect on service quality. A partial mediation effect was identified, demonstrating that innovative work behaviour strengthens the link between digital leadership and service quality. The study provides empirical evidence on the role of digital leadership in enhancing innovative work behaviour and improving service delivery outcomes. These findings offer practical implications for public sector leaders seeking to build digitally enabled, innovative, and high-performing work environments.

Keywords: digital leadership, innovative work behaviour, service quality and public sector.

LIST OF ABBREVIATIONS

Abbreviation / Acronym	Full Meaning
4IR	Fourth Industrial Revolution
CMB	Construction Management Branch
DPWI	Department of Public Works and Infrastructure
EGDI	E-Government Development Index
EPWP	Expanded Public Works Programme
GRC	Governance, Compliance and Risk
ICT	Information and Communication Technology
ISADP	Information Society Development Plan
IWB	Innovative Work Behaviour
NWU	North West University
OCAI	Organisational Culture Assessment Instrument
PMO	Programme Management Office
POPIA	Protection of Personal Information Act
SDGs	Sustainable Development Goals
SET	Social Exchange Theory
SERVQUAL	Service Quality Assessment Model
SPSS	Statistics Programme for the Social Sciences
SSA	Sub-Saharan Africa
UN	United Nations

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CHAPTER 1 INTRODUCTION OF THE STUDY

1.1 INTRODUCTION

The digital era has redefined how organisation's structure, operate, determine leadership style and how it can be used to improve the service delivery within the public service globally. In the public sector, the emergence of digitisation has put pressure on governments and organisations to accelerate their digitalisation strategy to improve service delivery. Digital Leadership has therefore emerged as a critical component to transform and ensure a successful digitalisation in government. Digital Leadership is demonstrated through the leader's ability to create and communicate the digital strategy vision, inspire innovative behaviour and foster an organisational culture that enables and supports technology change (Öngel, Günsel, Çelik, Altındağ, & Tatlı, 2024:4).

In the Republic of South Africa, the Department of Public Works and Infrastructure (DPWI) is mandated to be a state immovable custodian and manager and deliver infrastructure to enable the economic development of the country. Recent studies show that the government is lagging in technology and innovation, a lack of digital skills and infrastructure (Shibambu & Ngoepe, 2024:66). This challenge has hindered the government from capitalising on the available technology to improve service delivery. To address this gap, this study aims to explore how digital leadership influences employees' innovative work behaviour and service quality to enhance DPWI's digitalisation strategy.

The study is supported on the basis that leadership in the digital era extends beyond traditional leadership styles. Leadership requires digital competencies and flexibility to ensure a successful digitalisation strategy (Nuryadin, Sobandi, & Santoso, 2023:102). Digital leadership enables employees to practice innovative work behaviour that promotes digital transformation and improves service delivery. Innovative Work Behaviour is dependent on leadership to see positive outcomes. Service quality serves as an indicator of how organisational behaviour (leadership and innovative work behaviour) translates into tangible outcomes.

Chapter one provides the background of the study, the rationale, and the problem statement that the study seeks to address. Aims and objectives of the study are clearly articulated to give direction to the research. It further states research questions to be answered and hypotheses that will be tested and concludes by providing an outline of the dissertation structure.

1.2 BACKGROUND OF THE STUDY

Digital transformation has become a defining feature of organisational change in the contemporary era, fundamentally reshaping how organisations operate, deliver value, and respond to stakeholder expectations. Advances in digital technologies have disrupted traditional business models, altered consumer behaviour, and placed increasing pressure on both private and public sector organisations to modernise their systems and processes (Verhoef *et al.*, 2021:889). These developments have necessitated a shift away from conventional operational models towards digitally enabled strategies that prioritise innovation, agility, and responsiveness (Öngel *et al.*, 2024:2; Shin, Mollah & Choi, 2023:2).

In response to these changes, leadership approaches have also evolved. Digital leadership has emerged as a critical capability for guiding organisations through complex digital environments characterised by rapid technological change and uncertainty (Öngel *et al.*, 2024:3; Al-Hadrawi & Reniati, 2023:130). Digital leadership extends beyond traditional leadership styles by emphasising the leader's ability to formulate and communicate a digital vision, integrate digital technologies into organisational processes, and foster a culture that supports innovation and continuous learning (Oktaysoy, Topcuoglu & Kaygin, 2022:409; Zhu, 2022:2). In this study, digital leadership is understood as a leadership capability that combines digital competence, strategic orientation, and behavioural support to enable employees to adapt, innovate, and perform effectively in digitally transforming environments.

Globally, governments have increasingly prioritised digital transformation as a mechanism for improving efficiency, transparency, and service delivery. Several countries have launched large-scale digital initiatives, such as Industry 4.0 in Germany, Society 5.0 in Japan, UK Industry 2025, and Made in China 2025, reflecting the strategic importance of digitalisation for national competitiveness and public sector performance (Sağbaşı *et al.*, 2023:1). In Europe and Asia-Pacific, significant financial investments have been directed towards digital transformation, with the Asia-Pacific region alone allocating over USD 380 billion to digital transformation initiatives in 2019 (Sağbaşı *et al.*, 2023:1). These initiatives have highlighted the growing demand for digitally competent leaders capable of navigating complex technological and organisational change (Philip, Gilli & Knappstein, 2023:394).

While advanced economies benefit from strong digital infrastructure and high levels of digital readiness, emerging economies experience uneven progress in digital transformation due to contextual constraints. Studies indicate that infrastructure gaps, limited digital skills, and socio-

economic disparities continue to impede digitalisation efforts in many developing regions (Cahyadi & Magda, 2021:6–7; Zervas & Stiakakis, 2024:19). In Africa, the digital transformation trajectory is shaped by economic conditions, technological infrastructure, and institutional capacity, with leadership identified as a key determinant of successful digital adoption (Omol, Mburu & Abuonji, 2024:38). Strong digital leadership is therefore essential for fostering a culture of innovation, technology adoption, and adaptability within African public institutions (Omol *et al.*, 2024:45).

South Africa, as a developing economy, has embraced digital transformation as part of its Fourth Industrial Revolution (4IR) agenda, positioning digitalisation as a driver of inclusive growth, productivity, and socio-economic development (Manda, 2021:309). Empirical evidence suggests that the adoption of digital technologies contributes positively to productivity in South Africa, reinforcing the potential value of digital transformation initiatives (Obokoh *et al.*, 2024:6). To enhance service delivery and citizen-centred governance, South African public institutions have increasingly adopted digitalisation strategies aligned with e-government and smart governance objectives (Manda, 2021:309).

Despite these policy commitments, the South African public sector continues to face significant challenges in implementing digital transformation effectively. These challenges include limited digital skills, outdated ICT infrastructure, bureaucratic systems, and resistance to change (Shibambu & Ngoepe, 2024:64). Moreover, digital governance reforms operate within a complex institutional environment shaped by the coexistence of Traditional Public Administration, New Public Management, and Public Value Management approaches. Traditional Public Administration emphasises hierarchy and rule-based control, New Public Management prioritises efficiency and performance, while Public Value Management focuses on collaboration, innovation, and citizen value creation (Ringson & Matshabaphala, 2023:69). The transition towards digitally enabled public value creation has intensified tensions between these approaches, placing additional demands on leaders and employees.

Within this context, employee behaviour plays a critical role in determining whether digital transformation initiatives translate into improved organisational outcomes. Innovative work behaviour, defined as employees' intentional generation, promotion, and implementation of new ideas aimed at improving processes, services, or performance, is essential for realising the benefits of digital transformation (Sudibjo & Prameswari, 2021:2). Leadership support has been identified as a key enabler of innovative work behaviour, particularly in environments characterised by technological disruption and uncertainty (Erhan, Uzunbacak & Aydin, 2022:6).

The Department of Public Works and Infrastructure (DPWI) is a national government department mandated to manage state-owned immovable assets and deliver infrastructure that supports South Africa's socio-economic development. As a service-oriented public institution, DPWI operates in a complex operational environment that increasingly relies on digital systems, innovation, and cross-functional coordination. However, studies indicate that government departments, including DPWI, remain constrained by limited digital capability, skills shortages, and slow adaptation to digital systems, which negatively affect service delivery outcomes (Shibambu & Ngoepe, 2024:66).

Although international and regional literature increasingly recognises the importance of digital leadership in driving innovation and performance, empirical research examining how digital leadership influences innovative work behaviour and service quality within the South African public sector remains limited (Nuryadin *et al.*, 2023:104). Existing studies have predominantly focused on technological systems or policy frameworks, with insufficient attention given to the behavioural mechanisms through which leadership affects employee innovation and service quality, particularly within infrastructure-focused government departments.

Against this backdrop, this study seeks to contribute to the body of knowledge by examining the influence of digital leadership on innovative work behaviour and service quality within a selected South African government department. By focusing on DPWI, the study responds directly to calls for context-specific empirical research and aims to clarify the role of digital leadership in enabling innovation and improving service delivery within South Africa's public sector.

1.3 RATIONALE OF THE STUDY

The accelerating pace of digital transformation within the public sector has fundamentally altered how government departments operate and deliver services. In South Africa, digitalisation is increasingly positioned as a strategic mechanism for improving efficiency, transparency, and service quality in line with the Fourth Industrial Revolution (4IR) agenda (Manda, 2021:309). However, the successful implementation of digital transformation initiatives depends not only on the availability of digital technologies but also on leadership capability and employee behaviour.

The Department of Public Works and Infrastructure (DPWI), as a national department responsible for infrastructure delivery and the management of state-owned immovable assets, operates in an environment characterised by high service delivery demands, complex stakeholder expectations, and increasing reliance on digital systems. Despite policy commitments towards digitalisation,

public sector organisations in South Africa continue to experience challenges related to limited digital skills, inadequate ICT infrastructure, bureaucratic processes, and resistance to change (Shibambu & Ngoepe, 2024:64). These challenges hinder the effective utilisation of digital technologies and limit the potential benefits of digital transformation for service delivery.

Digital leadership has been identified in international literature as a critical enabler of digital transformation, employee innovation, and organisational performance (Öngel *et al.*, 2024:3; Al-Hadrawi & Reniati, 2023:130). Leaders who possess digital competencies, articulate a clear digital vision, and support employees through technological change are more likely to foster innovative work behaviour and improve organisational outcomes (Oktaysoy *et al.*, 2022:409; Erhan *et al.*, 2022:6). However, much of the existing research on digital leadership has focused on private sector organisations or developed economies, with limited empirical attention given to the South African public sector context.

Furthermore, prior studies in South Africa have largely concentrated on technological systems, e-government readiness, or service delivery challenges without explicitly examining the behavioural mechanisms through which leadership influences innovation and service quality (Shibambu & Ngoepe, 2024:66; Ringson & Matshabaphala, 2023:68). As a result, there is insufficient empirical evidence on how digital leadership shapes employees' innovative work behaviour and how such behaviour, in turn, affects service quality in public sector institutions.

The rationale for this study is therefore grounded in the need to address this empirical gap by examining the influence of digital leadership on innovative work behaviour and service quality within a selected South African government department. By focusing on DPWI, the study provides context-specific insights into how leadership practices can support innovation and enhance service delivery in infrastructure-focused public institutions. The findings are expected to inform leadership development, digital transformation strategies, and policy interventions aimed at improving public sector performance in South Africa.

1.4 PROBLEM STATEMENT

Rapid technological advancement continues to reshape organisational operations and public service delivery globally, creating both opportunities and challenges for public sector institutions. Governments are increasingly expected to adopt digital technologies to enhance efficiency, transparency, and citizen-centred service delivery (Zhu, 2022:1). However, the implementation of

digital transformation in the public sector remains complex, particularly in developing countries where structural, institutional, and capacity-related constraints persist (Sacavém *et al.*, 2025:3). In Sub-Saharan Africa, digital development is hindered by a range of interrelated challenges, including shortages of digitally skilled human capital, limited funding, inadequate ICT infrastructure, and fragmented regulatory and policy frameworks (World Bank, 2024). Although digital technologies are increasingly available, their effective utilisation remains low due to leadership gaps, resistance to change, and insufficient organisational readiness. In South Africa, for instance, high levels of mobile broadband coverage have not translated into widespread and effective digital engagement, highlighting a disconnect between technological infrastructure and meaningful digital adoption (World Bank, 2024).

Within the public sector, these challenges are further compounded by tensions between competing public sector management approaches. Digital governance initiatives have accelerated the shift from Traditional Public Administration, which emphasises hierarchy and rule compliance, towards New Public Management, which focuses on efficiency and performance, and Public Value Management, which prioritises collaboration, innovation, and citizen value creation (Ringson & Matshabaphala, 2023:69). This coexistence of management paradigms often creates ambiguity for public sector employees and leaders, increasing resistance to change and constraining innovative practices (Shava & Vyas-Doorgapersad, 2022:86).

The Department of Public Works and Infrastructure (DPWI) operates within this challenging environment. As a service-oriented department responsible for infrastructure delivery, DPWI faces persistent service delivery pressures while simultaneously being expected to modernise its systems through digital transformation. However, public sector digitalisation efforts are frequently undermined by shortages of digitally competent personnel, misaligned IT regulatory frameworks, limited funding, and inadequate leadership capacity to manage change effectively (Nuryadin *et al.*, 2023:94). These constraints negatively affect employees' ability to engage in innovative work behaviour and ultimately compromise service quality.

Although existing literature acknowledges the growing importance of digital leadership in public sector transformation, there remains a lack of empirical research examining how digital leadership influences innovative work behaviour and service quality within the South African public sector (Nuryadin *et al.*, 2023:104). Prior studies have either focused on technological adoption without considering leadership dynamics or examined leadership styles without linking them explicitly to innovation and service quality outcomes (Adie *et al.*, 2024:50; Shava & Vyas-Doorgapersad,

2022:88). Consequently, the behavioural pathways through which digital leadership contributes to improved service delivery remain insufficiently understood.

The core problem addressed in this study is therefore the limited empirical understanding of how digital leadership influences employees' innovative work behaviour and service quality within a South African government department. Without such understanding, public sector organisations risk investing in digital technologies without achieving the intended improvements in service delivery. This study seeks to address this problem by empirically examining these relationships within DPWI, thereby contributing evidence-based insights to support effective digital leadership and improved public sector performance.

1.5 RESEARCH OBJECTIVES

1.5.1 Research Primary Objective

- i. To examine the influence of digital leadership on innovative work behaviour and service quality within a selected South African Government Department.

1.5.2 Research Secondary Objectives

- i. To measure the influence of digital leadership on employees' innovative work behaviour.
- ii. To determine the effect of innovative work behaviour on service quality.
- iii. To assess the direct influence of digital leadership on service quality.
- iv. To examine whether innovative work behaviour mediates the relationship between digital leadership and service quality.

1.6 RESEARCH QUESTIONS

1.6.1 Primary Research Question

- i. How does digital leadership influence innovative work behaviour and service quality within a selected South African Government Department?

1.6.2 Secondary Research Questions

- i. What is the effect of digital leadership on innovative work behaviour among employees in a selected South African government department?

- ii. How does innovative work behaviour influence service quality in a selected South African government department?
- iii. To what extent does digital leadership directly influence service quality in the public sector?
- iv. Does innovative work behaviour mediate the relationship between digital leadership and service quality?

1.7 HYPOTHESIS STATEMENTS

H₁ Digital leadership positively influences innovative work behaviour.

H₂ Innovative work behaviour positively influences service quality

H₃ Digital leadership has a direct positive effect on service quality

H₄ Innovative work behaviour mediates the relationship between digital leadership and service quality.

1.8 PRELIMINARY LITERATURE REVIEW

Rapid evolution of technologies digitally has introduced new challenges for organisations and significantly reshaped leadership expectations and competencies (Zhu, Zhang, Xie & Cao, 2022:2). Digital transformation involves changes to organisational structures, culture, leadership approaches and employee roles, while also requiring continuous upskilling (Shibambu & Ngoepe, 2024:68). As a result, leaders are required to strengthen their digital capabilities and adapt to environments characterised by uncertainty and technological disruption (Zhu *et al.*, 2022:2). Digital leadership is broadly understood as the capacity to use computerized tools to guide organisational progress in the digital era (Al-Hadrawi & Reniate, 2023:131). Leaders who operate effectively in this space often emphasise employee growth, autonomy and the productive use of technology in daily work processes (Zhuang, Liu & Yu, 2024:675). Within the public sector, the importance of digital leadership has been increasingly recognised, especially as government departments aim to improve efficiency and citizen-centred service delivery (Galushi & Malatji, 2022:118).

Digital leadership must be able to foster an innovative culture within the organisation and inspire staff members to keep coming up with fresh concepts (Nuryadin *et al.*, 2023:92). The contribution of digital leaders to improving sustainable performance, stimulating innovation, encouraging engagement, raising digital intensity, and promoting creativity is becoming more widely acknowledged (Yang, Talha, Zhang & Zhang, 2025:2). Employees view leaders with strong digital

abilities favourably, and they are more likely to adopt creative behaviour (Hadi, Setiawat, Krana, Lada & Rahmawati, 2024:80). Employees who practice innovative work behaviour can swiftly and effectively identify novel work environments and offer creative solutions to enhance offerings (Sudibjo, & Prameswari, 2021:2). Leaders that can adapt fully to the digital age are thought to be more engaged with innovative work behaviour (Erhan, Uzunbacak & Aydin, 2022:6).

Smart digital services are crucial for improving service quality and are part of an evolving technology landscape (Ingsih, Astuti & Riyanto, 2024:3). Digital leadership is essential for fostering innovative work culture, which positively influences service outcomes (Öngel et al., 2024:5). In light of the challenges faced by the South African public service, prioritizing digital leadership is vital for enhancing service delivery (Galushi & Malatji, 2022:120). Research shows that the success of digital transformation and service quality improvement relies on the effective application of digital leadership skills (Senadjki, Au Young, Ganapathy & Ogbeibu, 2024:166).

Digitalisation in the public sector enhances government transparency and accountability (Sopamena, 2024:301). Charismatic digital leaders positively impact job performance by empowering employees and fostering innovation in problem-solving (Alessa, 2021:4). Digital leadership supports change and the enhancement of organisational quality services and behaviour via the use of contemporary information technology (Karakose, Kocabas, Yirci, Papadakis, Ozdemir & Demerkol, 2022:3). Innovative leadership is essential for promoting organisational innovation, as evidenced by the reviewed literature by Nugroho, Selamat, Lestari & Mudjijah (2025:243). An innovative workplace culture is fostered by leaders who promote creativity, knowledge exchange, and flexibility.

1.9 SIGNIFICANCE OF THE STUDY

1.9.1 Theoretical Contributions

This study contributes to the evolving literature on digital leadership within the public services, focusing on developing states such as South Africa. The study expands Digital Leadership Theory by examining how digital competencies, visionary leadership foster innovative work behaviour in employees and improve service delivery within government systems.

The study demonstrates linkages between transformational, agile, and distributive leadership theories with innovative work behaviour and the service quality frameworks, developing an extensive, multi-theoretical model that covers the dynamics of digital transformation processes in the public sector context. The study was guided by the Framework for Digital Transformation

Leadership (Weber, Krehl, & Röttgen, 2022) and grounded on Job Demand-Resource and Social Exchange Theories and SERVQUAL Model.

The study addresses a critical gap in empirical research on digital transformation in the public service, particularly in Africa, where digital leadership remains under-researched, with limited theories and insufficient quantification.

1.9.2 Practical Contributions to Managers and Policy Makers

The study provides insights for public services leaders, HR Managers and policymakers by examining the influence of digital leadership on employee innovative behaviour. It demonstrates that fostering digital competencies, promoting feedback culture, and strategic adaptability directly shape employees' innovative work behaviour, which contributes towards improved service delivery. The research serves as an evidence-based guidance for developing public sector leadership capacity, digital transformation and leadership styles that enable innovative work behaviour. It also assists government departments in developing monitoring and evaluation tools that will inform the leadership developmental programmes to emphasise digital fluency, emotional intelligence and decision-making.

The study serves as a guide for the public sector to develop HR strategies that will shape the recruitment, training and evaluation of digital leaders in departments focusing on innovative work behaviour and service delivery improvement. It outlines the importance of feedback, recognition and empowerment systems as vehicles to boost creative work behaviour in organisations undergoing digital transformation. The study supports change management by identifying organisational culture and processes that either enable or hinder innovative work behaviour and the digitalisation of public service.

1.9.3 Practical Contributions to Responsible Management Related to United Nations Sustainable Goals Development (SDGs)

Digital Leadership aligns well with the objectives of SDG 8 that focus on promoting sustainable economic growth and enhancing productivity as a critical driver for creating high-quality, well compensated employment (Burinskeine & Serzante, 2022:7). This research work also contributes to the SDG 8 (Decent Work and economic Growth) by outlining how digitalisation of workplaces can create new growth opportunities for employees and support inclusive economic participation, provided individuals have adequate access and the necessary digital skills required to thrive in the digital environment (Abed, Rizk, Zaki & Elshewey, 2024:57).

Information and Communication Technology (ICT) serve as a crucial tool for reducing inequalities by fostering knowledge and information exchange in underprivileged communities, particularly among women, girls, and persons with disabilities (Shava & Vyas-Doorgapersad, 2022:84).

The study will benefit public services leaders, HR Management, policymakers and DPWI and relevant agency employees. Academically, it will serve disciplines such as public administration, leadership studies and organisational behaviour. The wider industry benefit further extends to the world of public service delivery and is directly in favour of South African citizens and the support of socio-economic development.

1.10 ETHICAL CONSIDERATION

Adherence to ethics when conducting a study is critical to undertake the study responsibly and ensure the protection of the participants' rights and dignity (Bryman, Bell & Hirschsohn, 2021:132). The study adhered to the ethical standards of the NWU, and ethical clearance was granted by the Economic and Management Sciences Research Ethics Committee (EMS-REC), Ethics number (NWU 00895-25-A-4). A formal letter was obtained from the Accounting Officer (Director-General) of the Department of Public Works and Infrastructure approving access for employees to collect data (refer to **Appendix A**). Ethical clearance was obtained prior collection of data from the participants (refer to **Appendix B**). The participants were informed about the voluntary participation, anonymity and confidentiality, and it was maintained as per the requirements. All participants were required to provide consent to participate in the study; if they did not consent, the online system prevented them from proceeding with the questionnaire (refer to **Appendix C**). The data collection strictly adhered to the Protection of Personal Information Act (POPIA) of 2023 and the NWU's ethical guidelines.

1.11 CHAPTER OUTLINE

The study was divided into the following five chapters:

Chapter 1: Introduction to the study

The initial chapter of the study outlined the investigation's framework, featuring an introduction, background, problem statement, significance, objectives, and guiding research questions. It also provided a concise literature review, definitions of key terms, a summary of the chapter, ethical considerations, and an overview of the research design and methodology.

Chapter 2: Theoretical review and foundation

This chapter reviews the literature on the subject that the study aims to explore. It offered a thorough overview of several theories that are pertinent to digital leadership, innovative work behaviour and perceived quality service. A thorough analysis of relevant research about digital leadership, and its effects on innovative work behaviour as perceived quality services, comprised the literature review.

Chapter 3: Research design and methods

This chapter outlines the research methodologies and methods employed in the study, detailing the population and sampling strategy. It also discusses the data collection methods and instruments used, concluding with a comprehensive overview of the ethical considerations involved in the research.

Chapter 4: Research findings, results and analysis

Chapter four detailed the research findings, results and analysis of the data collected from the participants.

Chapter 5: Summary of findings, conclusions and recommendations

After examining the findings, a concluding chapter summarises the entire study and offers suggestions for management and further research based on the findings

1.12 CONCLUSION

Chapter one lays a foundation for rationale, the importance of examining the influence of digital leadership on innovative work behaviour and service quality within the selected South African government department. The chapter detailed the challenges arising from limited digital leadership capacity, lack of innovative behaviour and persistent service delivery challenges faced by the public sector. It also explains the objectives of the study, research questions to be answered and hypotheses that guide the study, supported by the preliminary literature review. The following chapter builds on this foundation by presenting the theoretical and empirical literature related to digital leadership, innovative work behaviour and service quality.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter introduced the study by providing background and the problem statement, highlighting the research significance of the study and framing the study's research objective and question. The literature pertaining to the topic being studied was reviewed in this chapter.

Chapter two begins with introducing the study's grounding frameworks and theories, such as Job-Demand-Resource Theory and Social Exchange Theory. These theories form the conceptual basis for explaining the relationships between the study variables. The chapter outlines a comprehensive literature review that was conducted on the independent variable, which is digital leadership and the dependent variables, which are innovative work behaviour and the mediating variable, which is service quality. The literature provides insights into the studies that have been conducted on the influence of digital leadership on employees' innovative work behaviour and service delivery. The literature review provides a conceptual framework to guide the study and to identify research gaps that the study aims to address and contextualise to the public sector.

2.2 THEORETICAL CONCEPTUAL FRAMEWORK FOR THE LITERATURE REVIEW

This study is grounded on a theoretical framework to investigate the influence of digital leadership (independent variable) on innovative work behaviour (mediating variable) and service quality (dependent variable) within a South African public sector department. Grounded in a positivist paradigm, the framework integrates well-established theories to explain the relationships between constructs, ensuring alignment with the study's quantitative methodology and hypothesis-driven approach. The digital transformational framework is highlighted, followed by the main theories: Job Resource Demand Theory, which explains digital leadership as a resource that supports innovation and leads to organisational performance; Social Exchange Theory (SET), which explains the behavioural mechanisms underpinning the leader-employee relationship; and the SERVQUAL Model is included for its relevance to public sector service delivery measurements.

2.2.1 Framework for Digital Transformation Leadership

In the context of digital transformation, the Digital Transformation Leadership Framework guides suitable leadership behaviours (Weber, Krehl, & Röttgen, 2022:8). This paradigm emphasises how crucial it is to modify leadership approaches to meet the demands of digitalisation, stressing the necessity for leaders to be flexible, creative, and adept at using digital tools. The framework identified four success factors of digital leadership: customer-oriented, governance, supportive and agile organisational culture that engages managers and employees, analytics, business elements and digital components (Philippart:2022:2). On the framework, Weber *et al.* (2022:8) identified seven digital leader roles: digital pioneer, innovator, enabler, mentor, mentee, networker, and manager of which is distinguished by leadership behaviours, innovation and service excellence (Ming & Mansor, 2024:2).

2.2.2 Job Demand-Resource Theory

Job-Demand-Resource (JD-R) Theory [5] Developed by Academics Evangelia Demerouti and Arnold Bakker in 2001, the job demand resource model identifies job demands, as well as distinguishing them from job resources. Job demands are defined as features of work that require physical or psychological effort, including work pressure and cognitive demands. On the other hand, job resources are aspects that assist in attaining work goals, reduce demands, or aid personal development (e.g., social support and developmental opportunities). According to the model, although technology may increase job demands and stress, digital leadership serves as an important resource that provides support and training (Demerouti & Bakker, 2023:211). By combining technological know-how with business acumen, digital leaders can tackle complex problems and lead digital innovation that drives organisational success. An organisation's ability to handle unforeseen problems is greatly enhanced by digital leadership, which lessens the impact of external disruption (Ye, 2025:6).

2.2.3 Theory of Social Exchange

Social exchange theory was developed by George Homans in 1958, who perceived social behaviour as an exchange of rewards and punishments (Tripp, 2023:91). SET theory frames digital leadership as an exchange of power,” meaning one party's capacity to persuade another to take action (Ahmad, Nawaz, Ishaq, Khan & Ashraf, 2023:2). Social Exchange Theory (SET) explains how digital leadership enhances employee innovative work behaviour emphasises Individuals acquire behaviors by observing others and processing environmental signals cognitively (Yang *et al.*,2025:7). SET implies that leadership support encourages reciprocal

actions like sharing knowledge, which fortifies social capital and innovative work behaviour creativity. Workers who believe in digital leadership as encouraging are more likely to impart information, producing group insights that stimulate imagination (Yang *et al.*, 2025:8).

2.2.4 SERVQUAL Model

The SERVQUAL model, created in 1988 by A. Parasuraman, Valarie A. Zeithaml, and Leonard L. Berry, assesses service quality by comparing customer expectations with their perceptions across five dimensions: tangibles, dependability, confidence, adaptability, plus empathy. The discrepancy between expected and actual service is the main focus of this assessment (Jusufbašić & Stević, 2023:2; Frank *et al.*, 2020:876). The level of interaction with the user determines the service quality as determined by SERVQUAL instruments (Jusufbašić & Stević, 2023:2). Leadership-driven digital initiatives reduce service gaps, enhancing quality service. This model explains how digital leadership influences service quality by aligning technological and human resources with service delivery objectives (Frank *et al.*, 2020:877).

2.3 CONCEPTUAL FRAMEWORK FOR LITERATURE REVIEW

Digital leadership has emerged as a pivotal capability in the digital era, characterised by leaders' ability to strategically leverage technology to foster organisational transformation and performance (Ming & Mansor, 2024:3; Tigre, Henriques & Curado, 2024:57). Within the public sector, this leadership style is particularly significant as it addresses persistent challenges of inefficiency, limited resources, and outdated practices that hinder service delivery (Shibambu & Ngoepe, 2024:64).

Existing empirical literature highlights that digital leadership contributes significantly to organisational agility and innovation by fostering employee behaviours that promote creativity and adaptability (Nuryadin *et al.*, 2023:93; Gao & Gao, 2024:20). When leaders combine digital technologies with forward-thinking and flexible strategies, they are better able to stimulate innovative work behaviour among employee's behaviour that supports problem-solving, idea development, and the generation of new approaches to address evolving societal needs (Yudiatmaja, Salomo & Prasajo, 2023:1; Nugroho *et al.*, 2025:231). Innovative work behaviour is closely linked to service quality outcomes in government institutions, as employees' willingness to generate and implement creative ideas directly improves responsiveness, transparency, and accessibility in public service delivery (Kousina & Voudouris, 2023:1480; Ingsih *et al.*, 2024:3). Studies confirm that digital leadership positively shapes innovative behaviours, which in turn drive

performance and value creation for citizens (Erhan, Uzunbacak & Aydin, 2022:14; Nugroho *et al.*, 2025:243). Moreover, while service quality is often associated with technological adoption, leadership remains a critical determinant in aligning digital reforms with citizen expectations (Nuryadin *et al.*, 2023:102; Sopamena, 2024:302).

This study conceptualises digital leadership as a driver of innovative work behaviour, which subsequently influences service quality within a South African government department. By integrating these constructs, the framework seeks to address the empirical gap in linking digital leadership and innovation directly to service quality in the public sector context.

Conceptual Framework

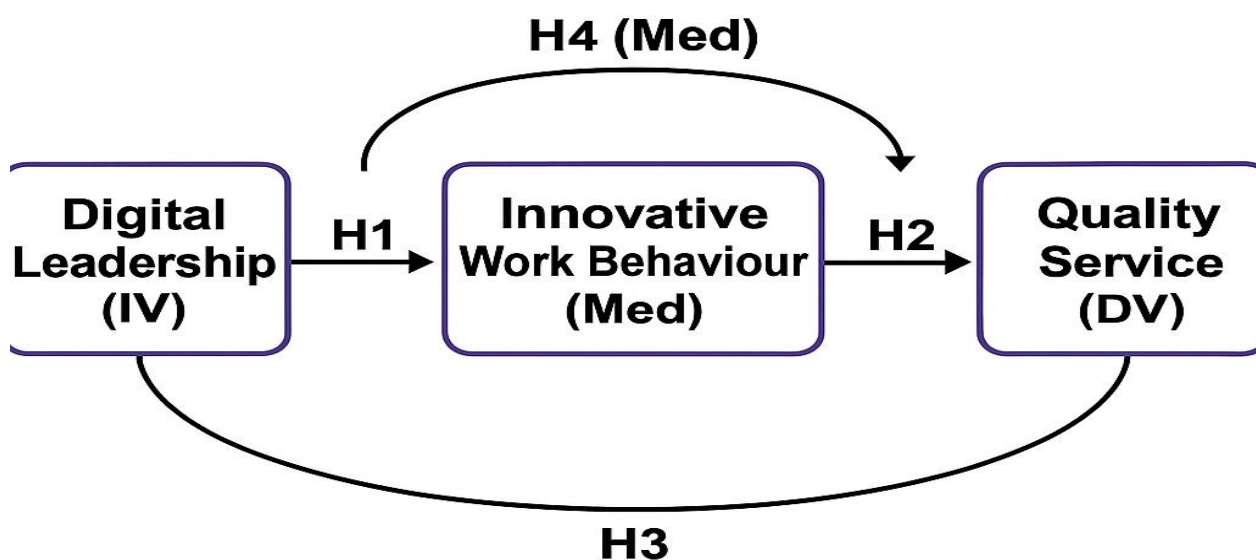


Figure 1: Conceptual Framework

2.4 CONCEPTUALISING LEADERSHIP

Leadership in the digital age has its roots in the rapid expansion of internet technologies during the 1990s, when organisations increasingly adopted digital tools to enhance communication, coordination and decision-making (Nuryadin *et al.*, 2023:92). Its significance grew even more in

the 2000s as developments in information and communication technologies (ICT) accelerated digital transformation across various sectors (Nuryadin *et al.*, 2023:92). A related concept is e-leadership, which involves guiding and influencing individuals or teams through digital platforms in ways that shape their attitudes, behaviours and performance (Tigre *et al.*, 2024:42).

Digital leadership refers to the combination of competencies, skills and leadership behaviours that enable leaders to function effectively within increasingly digital organisational environments (Philip *et al.*, 2023:394). Leaders who demonstrate strong digital capability play an important role in supporting technological innovation, strengthening organisational competitiveness and facilitating sustainable development (Al-Hadrawi & Reniati, 2023:132). This form of leadership is shaped by several core elements, including strategic vision, entrepreneurial orientation and the ability to embed digital technologies into organisational processes (Sağbaş & Erdoğan, 2022:27).

2.4.1 Digital Leadership

Industry 4.0 has given rise to digital leadership, which is crucial for digitalisation and transformation (Karakose *et al.*, 2022:2). This form of leadership involves influencing the adoption of effective digital strategies and is vital for business success in an evolving technological landscape (Al-Hadrawi & Reniati, 2023:130). Digital leadership merges digital skills with a supportive culture, allowing leaders to adapt to rapid changes where traditional methods may falter (Ming & Mansor, 2024:2). Leaders in this area must proactively embrace technological advancements to enhance transformation and organisational performance (Tigre *et al.*, 2024:57).

Digital leadership capability is grounded in a range of competencies that emphasise effective use of technology and data, forming the technical foundation required for digitally enabled leadership (Adie *et al.*, 2024:46). According to Kusanke *et al.* (2023:5), effective digital leaders are expected to demonstrate five broad competency areas, namely political-administrative, social, technical, socio-technical, and organisational abilities. Philip and Knappstein (2023:402) further argue that successful digital transformation depends not only on technical proficiency but also on behavioural and strategic attributes such as empathy, visionary thinking, agility, and the capacity to make decisions informed by data. In addition to these, digital leaders must possess a range of interpersonal or “soft” skills, including cultural awareness, communication, creativity, innovation, and strong relationship-building abilities (Adie *et al.*, 2024:47). Collectively, these competencies support leaders in navigating technological change while ensuring that digital initiatives remain aligned with broader organisational priorities.

It is generally agreed upon as a significant factor in improving the agility of organisations and fostering innovation. As observed by Melamane (2023:10), it provides a timely and effective approach to managing the rapid pace of technological progress. In the public sector, Nuryadin *et al.* (2023:93) argue that digital leadership strengthens efficiency, improves transparency and accessibility, and promotes greater citizen engagement, which collectively support improved service delivery. Their findings further indicate that leadership approaches such as transformational, servant, and ethical leadership play an important role in facilitating digital transformation and enabling organisations to adapt to evolving strategic demands.

ICT and e-government are integral to government modernisation efforts (Galushi & Malatji, 2022:119). Successful digital leadership in government requires not only the digitisation of systems and operations but also the enhancement of human resource skills (Khoeroni, Suryadi & Gunawan, 2022:142). However, the South African public sector faces challenges in executing the Information Society Development Plan due to insufficient ICT skills and the government's limited capacity to deploy necessary personnel (Galushi & Malatji, 2022:118). Although there is recognition of the need for digital leadership, several structural barriers persist, including the absence of a digital transformation strategy, limited funding, outdated operational procedures, and leadership deficiencies (Shibambu & Ngoepe, 2024:64). These challenges are compounded by resistance to change and a lack of preparedness for Industry 4.0 and Society 5.0. Landscape must unavoidably target, concentrate on, and shape the skills and tactics required of digital leaders in the public sector (Adie *et al.* 2024:49).

A scoping review conducted by Adie *et al.* (2024:53) stressed the need to clarify definitions, identify competencies, and establish a solid theoretical foundation for digital leadership in public institutions. The view is supported by Gao & Gao (2024:2), arguing that while digital leadership has gained attention, it remains underexplored, particularly given the pace at which technology evolves and introduces new demands for leadership adaptation. Maulina and Yulianti (2024:80) examined how digital leadership affects millennial employees in East Java, finding that effective digital leadership enhances innovative work behavior and boosts performance. However, the research was restricted to a specific demographic, Generation Z, and did not consider the public sector.

A study by Cahyadi & Magda (2021:12) assessed digital leadership capacities across G20 nations, focusing on innovation, competitiveness, and digital readiness. The findings showed that most G20 countries benefit from strong infrastructure, skilled workforces, and supportive ecosystems. However, the study did not examine public sector contexts specifically and

recommended further comparative research across different country groups, including developing nations (Cahyadi & Magda, 2021:15).

While existing literature recognises the value of digital leadership in enabling innovation and organisational performance, particularly within technologically advanced contexts, there remains a significant gap in understanding its application within the public sector, especially in developing countries like South Africa. This study addresses that gap by investigating the role of digital leadership in shaping employee behaviour, creativity, and perceived service quality within a South African public infrastructure department.

2.4.2 Digital Leadership and Innovative Behaviour

Innovative Work behaviour is commonly understood as the process through which employees apply novel and unconventional methods to solve workplace problems, often driven by intrinsic motivation and creativity (Yudiatmaja, Salomo & Prasajo, 2023:1). Identifying the motivating factors and enablers of innovative work behaviour is essential for deepening the understanding of individual-level innovation within organisations (Yudiatmaja, Salomo & Prasajo, 2023:1). Numerous scholars have emphasised that innovative work behaviour constitutes a foundational element of organisational success, as it directly influences adaptability, competitiveness, and long-term sustainability (Groselj, Černe, Penger & Grah, 2021:680).

By examining what drives employees to engage in innovative behaviours, such as idea generation, development, and implementation, organisations can better cultivate environments that support creativity and continuous improvement. In the rapid technological advancement and globalisation, fostering innovation has become essential for sustaining organisational competitiveness (Salam, 2023:33). The demand for Innovation in the Public Sector is crucially increasing due to frequently shifting policy priorities and societal demands (Kousina & Voudouris, 2023:1480). Leaders play a key role in cultivating a culture of innovation by encouraging knowledge-sharing, supporting creativity, and enabling experimentation within organisations (Nugroho, Selamat, Lestari & Mudjijah, 2025:231).

Research highlights a growing interest in how digital leadership impacts employees' innovative work behaviour. Employees' views on digital leadership play a crucial role in their involvement in innovative tasks, with leadership skills being vital for achieving favorable results (Erhan et al., 2022:14). Additionally, a positive relationship exists between digital leadership and innovative work behavior, especially in settings that encourage e-learning and ongoing adaptation (Salam,

2023:15). The role of innovation in leadership is to promote employee engagement, enhancing knowledge exchange, and boosting organisational innovation (Nugroho *et al.*, 2025:243).

Digital leadership positively influences innovative behaviour, aligning with previous research that highlights digital leadership as a catalyst for organisational innovation (Gao & Gao, 2024:20). Digital leaders encourage employees to use motivation and positive stimulus to achieve their innovative efforts (Yudiatmaja *et al.*, 2023:3). Leaders who actively support innovation and encourage creativity are instrumental in developing an innovative organisational culture (Nugroho *et al.* 2025:243). Innovation-oriented HR practices, such as risk-tolerant environments and managerial support, significantly enhance employees' creative tendencies (Almunthiri, 2024:159). Digital leaders use technology to spur innovation because they understand its strategic consequences (Al-Hadrawi & Reniati, 2023:131)

The connection between transformational and authentic leadership and creative work practices is reinforced by psychological empowerment, suggesting that empowered individuals are more inclined to participate in creative activities (Groselj *et al.*, 2021:694). In the public sector, leaders are increasingly expected to develop digital competencies to navigate an evolving technological and organisational landscape (Ringson & Matshabaphala, 2023:71). Digital leadership, by fostering empowerment and structured feedback systems, plays a pivotal role in reducing innovation-related uncertainty (Shie, Wu, Huang & Lee, 2025: 10). This leadership style not only provides essential support for employees to participate in innovative activities but also significantly moderates the relationship between employee self-efficacy and deviant innovation (Shie *et al.*, 2025: 10).

Some findings present contradictions and reported no significant relationship between digital leadership and innovation work behaviour, as reflected by a p-value above the significance threshold (Hadi *et al.*, 2023:80). Innovation does not mediate the relationship between transformational leadership and innovative work behaviour (Tan, Van dun & Wilderom 2021:11). Readiness for innovation plays a significant role, suggesting that intermediary variables may be critical in understanding these dynamics. The research on how leaders create shared organisational mental models to support innovation remains underdeveloped as revealed by the study conducted by De Paula, Marx, Wolf, Dremel, Cormican, & Uebernickel (2022:44). Supporting this view, Groselj *et al.* (2021:699) noted inconsistencies in empirical findings. Some studies indicate positive relationships between leadership and innovative work behaviour, while others find negative or null effects. The study conducted by Sudibjo and Prameswari (2021:4) on transformational leadership and IWB, which has a negative value of 0.187 (T-stat $\frac{1}{4}$ 2.210, P $\frac{1}{4}$

0.013), the coefficients found between the exogenous and endogenous variables are positive. This is in contrast to most previous research, which discovered that transformational leadership improves IWB.

These discrepancies point to the influence of potential moderators or mediators, such as psychological factors, organisational context, or leadership style, that may shape the observed outcomes, while existing literature provides evidence for a generally positive association between digital leadership and innovative work behaviour.

2.4.3 Digital Leadership and Quality Service

Service quality is generally understood as the degree to which service delivery aligns with or surpasses the expectations of users. Parasuraman, Zeithaml & Berry (1988:12) introduced the SERVQUAL framework to explain this construct, identifying five core dimensions: reliability, responsiveness, assurance, empathy and tangibles that shape user perceptions of service performance. When these elements are effectively demonstrated, organisations tend to achieve stronger customer satisfaction, enhanced credibility and improved outcomes in public service environments.

Within the realm of the South African public sector, the phenomenon of digital transformation is increasingly viewed as a pathway to improved service delivery. However, Shibambu & Ngoepe (2024:68) identified a lack of coherent digital transformation policies and strategies, resulting in uneven implementation across government departments. This policy gap has hindered the widespread adoption of digital tools that could otherwise enhance service delivery outcomes. Similarly, Nuryadin *et al.* (2023:102) highlighted that digital technologies can enable governments to track and improve performance consistently, contributing to better service quality when properly implemented.

There are four core benefits of digitising public services: increased operational efficiency through automation, broader access to information, faster response times, and improved transparency (Sopamena, 2024:302). Nonetheless, the study did not explore the role of digital leadership in facilitating these outcomes, a notable limitation, given leadership's central role in enabling digital transformation. Other scholars have examined how foundational elements such as technological literacy and infrastructure affect the effectiveness and accountability of public administration (Sopamena, 2024:302). Digital tools can enhance service quality. In this literature review, challenges such as resistance to change, lack of system integration, and low digital literacy

remain significant barriers (Sibuea, 2025:26). The study did not assess how digital leadership might mitigate these barriers and support the optimisation of service quality in public institutions.

Research conducted by Budianto *et al* (2023:608) in the private sector further confirms the value of digital leadership in improving organisational performance, while a study on Telkom Indonesia found that digital leadership enhances organisational performance through its influence on dynamic capabilities (Budianto *et al.* 2023:608). Similarly. Digital leadership contributes to organisational performance indirectly through digital maturity, Leaders are pivotal in influencing digital culture, fostering innovation, and facilitating the adoption of emerging technologies (Heriansyah *et al.*, 2025:166). However, these findings are based on private-sector case studies and may not fully reflect the public sector's complexities, such as regulatory constraints and diverse stakeholder expectations.

A service-oriented mindset among public officials characterised by commitment, responsiveness, and ethical conduct is essential for meeting citizens' expectations in a digital age (Sopamena (2024:297). Leaders must be able to inspire such a mindset while simultaneously implementing technology-driven reforms. The importance of leadership in promoting performance as well as innovation is also reflected in Nugroho *et al.* (2025:243), who concluded that innovative leadership could generate long-term competitive advantages by aligning innovative strategies with organisational goals. Integrating digital tools within public sector institutions enhances teamwork and operational efficiency, which in turn elevates service quality (Ingsih *et al.*, 2024:3)

Despite these promising insights, there remains a significant gap in empirical research examining the direct relationship between digital leadership and perceived service quality within the public sector, particularly in developing countries like South Africa. Most existing studies either focus on private sector environments or overlook the leadership dimension altogether. Additionally, research often focuses on technological factors without adequately considering the human and strategic components necessary for successful digital transformation. This study aims to address these gaps by investigating how digital leadership influences perceived service quality within a selected South African public service department. By doing so, it contributes to a more comprehensive understanding of how leadership shapes service delivery in digitally evolving bureaucracies and offers practical insights for policy and managerial reform.

2.5 THE ROLE OF DIGITAL LEADERSHIP IN FOSTERING INNOVATIVE BEHAVIOUR

Leaders who encourage empowerment amongst the employees by sharing information to improve the knowledge, encourage innovation and support risk-taking to enhance employees' innovative behaviour (Nugroho, Selamat, Setyani Dwi Lestari, & Mudjijah, 2025:231) create a conducive environment to enable innovative work behaviour. Research has established a strong correlation between leadership styles such as transformational leadership and Innovative Work Behaviour (Caneva & Pusparini, 2024:447); however, the subject remains under-researched (Groselj *et al.*, 2021:694). Digital Leadership, formed by the strategic integration of digital technologies and emphasising agility, introduces a new dimension that differs from traditional leadership approaches (Tigre, Henriques, & Curado, 2023:57). This difference responds to rapid digital transformation demands where leaders must navigate technological complexities while fostering innovation.

2.6 RESEARCH GAPS IDENTIFIED IN THE LITERATURE REVIEWED

The reviewed literature revealed a growing interest in digital leadership, innovative work behaviour and public service digitalisation. Although researchers have focused on this topic, study gaps remain under-researched, particularly in the context of the South African public service. While other studies like Nuryadin *et al.* (2023) and Adie *et al.* (2024) explore digital leadership in public administration, they have research gaps in terms of solely examining its direct influence on innovative work behaviour. Research by Mulyani (2024) highlights digital leadership's impact on decision-making but does not assess creativity as a mediating factor in that process.

Existing studies on digital transformation in South Africa, such as Shibambu (2024), primarily focus on service delivery challenges without critically addressing leadership's role in driving innovation and creativity within the public sector. Likewise, while studies like Ringson & Matshabaphala (2023) address cultural change and leadership challenges, they do not fully explore the interaction between digital leadership and organisational culture in fostering innovation. A notable research gap exists in linking digital leadership to perceived service quality. Although Frank *et al.* (2020) examine service design and citizen satisfaction, they omit the role of leadership in shaping service quality outcomes.

Despite these promising findings, the literature reveals inconsistencies that highlight the need for further research. Hadi *et al.* (2023:80) found no noteworthy correlation between digital leadership and Innovative Work Behaviour, citing statistical evidence that fell below the significance

threshold. Found no statistically significant correlation between digital leadership and innovative work behavior; furthermore, organizational support for innovation acted as a mediator between transformational leadership and innovative work behavior, suggesting that contextual factors, such as readiness for change, may play a pivotal role (Tan *et al.*, 2021:11). The study conducted by De Paula *et al.* (2022:44) indicated that the mechanisms through which leaders cultivate shared organisational visions to support innovation remain underexplored, pointing to a gap in understanding the cognitive and cultural dimensions of leadership.

The study conducted by Groselj *et al.* (2021:699) noted that empirical findings on leadership and Innovative Work Behaviour are inconsistent, with some studies reporting positive associations and others identifying negligible or contradictory effects (Groselj *et al.*, 2021:699). These discrepancies may stem from moderating variables, such as psychological empowerment, organisational culture, or sectoral differences, which require deeper investigation. In contrast to the well-documented link between transformational leadership and Innovative Work Behaviour, the association between digital leadership and this construct is less established, particularly in the public sector (Groselj *et al.*, 2021:694). This gap is critical, as digital leadership's emphasis on technological integration and strategic adaptation may uniquely influence innovation in public institutions undergoing digital transformation.

The study will examine the influence of digital leadership on innovative work behaviour and perceived service quality in a selected South African public sector department. By doing so, it aims to contribute to both academic understanding and practical policy development within public administration.

2.7 CONTEXTUAL RELEVANCE TO THE PUBLIC SECTOR IN SOUTH AFRICA

The public sector, particularly in developing countries like South Africa, faces unique challenges that underscore the importance of studying digital leadership and Innovative Work Behaviour. Structural constraints, such as limited resources, outdated procedures, and resistance to technological change, often hinder innovation in public institutions (Shibambu & Ngoepe, 2024:64).

Digital leadership, with its focus on leveraging digital tools to enhance efficiency and responsiveness, offers a potential pathway to overcoming these barriers by fostering Innovative Work Behaviour among employees. However, empirical research examining this relationship within South Africa's public sector remains scarce, representing a significant gap in the literature.

In the South African context, studies such as Ringson & Matshabaphala (2023:71) highlight the need for leaders to develop digital competencies to navigate evolving technological landscapes. These studies do not explicitly explore how digital leadership influences Innovative Work Behaviour or its downstream effects on service delivery. The lack of focused research on this topic, combined with the predominance of private-sector and global north studies, limits the applicability of existing findings to South Africa's public sector realities (Karakose *et al.*, 2022:15). This study addresses these gaps by examining the role of digital leadership in shaping Innovative Work Behaviour within a South African public infrastructure department, contributing to both academic knowledge and practical policy development.

2.8 CONCLUSION

The importance of theory in understanding the influence of leadership on employee behaviour and creativity during digital transformation is widely recognised among scholars and professionals. The literature review indicates that digital leadership fosters creativity, adaptability, and service excellence, shaping employee attitudes and organisational culture. Its significance is increasingly acknowledged in the public sector for enhancing operational efficiency and citizen-focused services. Nonetheless, challenges such as insufficient digital skills, outdated infrastructure, and resistance to change hinder progress. The effectiveness of digital transformation initiatives in improving public service performance relies on assessing the role of digital leadership in promoting creative practices and perceived service quality within the Department of Public Works and Infrastructure (DPWI) (Shibambu & Ngoepe, 2024). The subsequent chapter will outline the research design and methods employed to collect empirical data for this study.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The literature about the theme under investigation was evaluated in the preceding chapter. The research methodology and methodologies utilised to address the study's stated research topics are thoroughly explained in this chapter. The research paradigm that guided the investigation is thoroughly discussed at the beginning of the chapter. The research strategy and methodology used are then described. The population, sampling methodologies, measuring tools, data collection procedures, and data processing and interpretation methods are all covered in detail in this chapter. The chapter ends with an explanation of the measuring device's validity and reliability, as well as the study's ethical considerations.

3.2 RESEARCH PARADIGM

The quantitative methodological approach used in this study was philosophically supported by the positivist research paradigm. The foundation of positivism is the idea that reality can be objectively observed, measured, and analysed and exists apart from human perception (Hirschesohn, 2021:32). This paradigm thus facilitates the development of generalisable findings by viewing knowledge as originating from empirical evidence and logical reasoning. Given the study's emphasis on investigating the impact of digital leadership on creative work practices and perceived service quality within a particular South African government department, positivism was a particularly suitable choice. In this framework, the researcher uses statistical methods to find and examine relationships between variables while assuming the role of an impartial, dispassionate observer.

This method supports the idea that employee perceptions and organisational behaviour can be measured, allowing for the creation of evidence-based insights. Positivism provides a strong and suitable epistemological position in the public sector, where quantifiable results are essential for policy formation and improving service delivery (Bryman, Bell & Hirschesohn, 2021:32).

3.3 RESEARCH APPROACH (METHOD)

Using a deductive research methodology, this study generated hypotheses from accepted theoretical frameworks and then tested them with empirical data. Through deductive reasoning, the researcher can test predetermined theoretical relationships involving digital leadership, innovative work behaviour and service quality using quantitative evidence (Bryman, Bell &

Hirschesohn, 2021:8). The positivist paradigm, which emphasises objectivity, quantification, and causal inference, is in line with this strategy. Through the application of established theoretical models to a South African government department, the study not only assesses the theories' suitability in a new setting but also makes a significant contribution to the development of theoretical knowledge and real-world implementation in the public administration field. A methodical and structured analysis of the connections between digital leadership (an independent variable), innovative work behaviour (a mediating variable), and perceived service quality (a dependent variable) was made possible by the deductive approach. The study's validity, reliability, and generalisability are all improved by this methodological alignment.

3.4 METHODOLOGICAL CHOICE

The study adopted a quantitative methodological approach to generate numerical data that could be used to analyse and test relationships among the identified variables. This approach aligns with the study's deductive orientation, which is centred on evaluating predetermined hypotheses concerning the influence of digital leadership on innovative work behaviour and service quality within a selected South African government department. Rooted in the positivist paradigm, the quantitative method assumes that phenomena can be objectively measured through structured instruments and statistical procedures (van Aardit & Hirschesohn, 2021:48). The choice of this methodology is appropriate because it allows for the systematic assessment of variable relationships and supports the study's aim of producing empirically verifiable results that can inform organisational decision-making. By applying a method suited to hypothesis testing and statistical examination, the study enhances its ability to contribute credible evidence to ongoing discussions on improving public service delivery (Bryman, Bell & Hirschesohn, 2021:48).

3.5 RESEARCH DESIGN

Given its quantitative methodological orientation and compatibility with the positivist paradigm, this study's use of a correlational research design was appropriate. Examining the connections between the independent variable (digital leadership), the mediating variable (innovative work behaviour), and the dependent variable (perceived service quality) in a particular South African government department was the main goal. Since it allows for the evaluation of the direction and strength of statistical relationships between naturally occurring variables without requiring the manipulation or control of the research environment, correlational research is especially well-suited for this purpose (Faasen & Hirschesohn, 2021:107). The design aligns with the study's

deductive reasoning, which tests hypotheses based on accepted theoretical frameworks. Analysis of the relationships between these constructs in the context of the South African public sector specifically looks at the hypothesis that innovative work behaviour, which in turn improves perceived service quality, is positively impacted by digital leadership. The study's goal of producing broadly applicable and empirically supported insights pertinent to public administration and digital transformation initiatives is supported by this design decision.

3.6 TIME HORIZON

The study used a cross-sectional time horizon, in which employees of a particular South African government department were given a structured survey to complete at one particular moment in order to gather data. Without the need for longitudinal tracking, this design made it easier to examine the relationships between the independent variable (digital leadership), the mediating variable (innovative work behaviour), and the dependent variable (service quality). To support the study's goal of analysing these associations in a time- and money-efficient manner, the cross-sectional approach is suitable for studies that aim to take a momentary picture of the relationships and conditions that currently exist within a particular context (Bryman, Bell & Hirschsohn, 2021: 109).

3.7 DELINEATION

The constructs of digital leadership, creative work practices, and perceived service quality are the main topics of this study (Hogan 2005:65). The demarcation of study is the South African National Department of Public Works and Infrastructure (DPWI), which has twelve offices: the Head Office based in Pretoria and 11 Regional Offices across 09 Provinces: Pretoria, Johannesburg, Port Elizabeth, Mthatha, Nelspruit, Bloemfontein, Mmabatho, Limpopo, Durban, Kimberley, and the Western Cape Regional Offices. The Provincial Departments of Public Works, other public service departments, and private sector organisations are specifically not included in the study's scope. By ensuring a targeted investigation within a national public sector framework, this delimitation enables more precise and context-specific findings pertinent to the DPWI's operational dynamics and service delivery mandates.

3.7.1 Inclusion and Exclusion Criteria

To ensure that the chosen sample complied with ethical guidelines and the goals of the study, it was crucial to apply inclusion and exclusion criteria to find participants who were both suitable

and eligible for the study (Hogan 2005:65). These standards were created especially to make it possible to choose a representative group of workers from a national public sector organisation in South Africa which oversees providing infrastructure. The emphasis was on people who held positions that were directly related to the three main constructs being studied: perceived service quality, innovative work practices, and digital leadership. The purpose of this focused strategy was to improve the validity, reliability, and relevance of the information gathered.

3.7.2 Inclusion Criteria

To align with the research objectives and ethical standards, the study clearly defined inclusion criteria for participant selection. Eligible participants were employees of the DPWI who were employed on a permanent or contract basis. The employees selected are within DPWI operations functions, which include Construction Management, Facilities Management, Real Estate Management Services and Real Estate Information System and support functions, which include Finance, Supply Chain Management, Corporate Services, Programme Management Office, Expanded Public Works Programme and Governance, Risk and Compliance. The employees employed within these functions are directly engaged in the department's digital transformation interventions and are critical to understand the influence of digital leadership on innovative work behaviour and perceived quality of service. (Hogan 2005:65).

All participants were based in any of DPWI's offices across the South African nine Provinces: Gauteng, Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northwest and Western Cape to ensure a national geographical spread representative to capture diversity in the operational context (Statistics South Africa, 2022:10). According to ethical research standards, participation was subject to voluntary informed consent to complete an online survey conducted using Microsoft Forms (Hogan 2005:65).

3.7.3 Exclusion Criteria

To ensure integrity and relevance of the research study, exclusion criteria were applied. The first exclusion criterion was individuals who are not employees of the DPWI, such as external stakeholders like contractors, consultants, and service providers. This criterion was implemented to ensure that the study focuses exclusively on the internal perspective of DPWI employees (Hogan 2005:65). The exclusion criteria included employees who did not consent to participate in the survey; this was to ensure adherence to ethical research principles that require voluntary participation (Bryman, Bell & Hirschsohn, 2021:132). Employees whose roles were not directly aligned with the core or support functions of the department, such as messengers, gardeners and cleaners, were excluded, because their responsibilities do not involve engagement with digital

systems or processes and are therefore not critical to the study's focus on digital leadership and innovation (Hogan 2005:65).

3.8 TARGET POPULATION

The study's target population consists of workers at the National Department of Public Works and Infrastructure (DPWI) in South Africa. Specifically, the study population includes all contract and permanent employees in the department who meet the predefined inclusion criteria. These include employees in operational positions like Construction Project Management, Facilities Management, and Property and Real Estate Management, as well as those in support positions like Corporate Services, Finance, Supply Chain Management, Governance, Risk and Compliance, and the Expanded Public Works Program. Due to their close connection to the department's digital initiatives, these positions are pertinent to the research focus.

The population excludes workers who are not employed by the department, such as outside contractors or service providers, as well as labourers, drivers, and messengers whose jobs are unrelated to operational or support responsibilities. Any eligible employee who does not provide their informed consent to participate in the study is likewise disqualified in accordance with ethical research guidelines. Based on the department's nationwide reach and available HR data, the department employs about 3,200 people (Statistics South Africa, 2022:45).

This figure includes employees from the department's twelve offices located throughout South Africa's nine provinces: Western Cape (Cape Town), Gauteng (Head Office, Johannesburg, and Pretoria), KwaZulu-Natal (Durban), Limpopo (Polokwane), Mpumalanga (Nelspruit), Northwest (Mmabatho), Northern Cape (Kimberley), Eastern Cape (Mthatha and Port Elizabeth) and Free State (Bloemfontein).

3.9 SAMPLE METHOD / TECHNIQUE AND SAMPLE SIZE

To guarantee representativeness and support the findings' generalisability to a larger population, probabilistic sampling techniques are crucial in quantitative research (Bryman, Bell & Hirschesohn, 2021:184). To ensure that every employee in the DPWI had an equal and independent chance of being chosen, a straightforward random sampling technique was used in this study. The department's Human Resources database, which included the entire population of roughly 3,200 workers from both operational units (Facilities Management, Construction Project Management, and Real Estate Management) and core support functions (Corporate Services,

Finance, Supply Chain Management, Expanded Public Works Program, and Governance, Risk, and Compliance), served as the basis for the sampling frame (Faasen, 2021:214). Initial simple random sampling was intended, but the use of electronic survey distribution through departmental emails and WhatsApp groups constitutes non-probability convenience sampling combined with voluntary participation. The investigation, therefore, utilised non-probability convenience sampling, which is widely accepted in behavioural and organisational research, particularly in public sector settings where randomisation is difficult to achieve.

A simple random sampling technique was employed to select participants from the DPWI human resources database (N = 3,200) using a random number generator and related statistical tools. This approach ensured that each employee had an equal probability of being selected, thereby minimising selection bias and enhancing the generalisability of the study's findings. Based on established sample size determination tables that consider population size, margin of error, and confidence level (Faasen, 2021:229), a target sample of 343 employees was deemed statistically appropriate, using a 95% confidence level and a 5% margin of error. Accordingly, a sample of 343 employees was selected for participation.

Of the selected sample, 161 employees completed the questionnaire, resulting in a response rate of 47%. The achieved effective sample size provided sufficient statistical power and maintained acceptable levels of accuracy and reliability, thereby offering a robust basis for extrapolating the findings to the broader DPWI employee population. These figures were applied consistently throughout the study, with the selected sample fixed at 343, the achieved effective sample at 161 respondents, and the response rate at 47%, in order to ensure transparency and methodological consistency in reporting. The adequacy of the sample size was further validated using the minimum sample size determination method proposed by Besekar, Jogdand and Naqvi (2024:1291), as illustrated in the following equation.

$$n = \frac{p(1-p)N \cdot \chi^2_{\alpha}(1)}{d^2(N-1) + p(1-p)\chi^2(1)}$$

Figure 2: Sample size Formula

Where:

(n): Sample size,

p = 0.5: Expected proportion (maximises sample size),

N = 3,200: Population size,

d = 0.05: Margin of error (5%),

$\chi^2_{(1)} = 3.841$: Chi-square value for 95% confidence level (Z = 1.96).

Substituting values

$$\begin{aligned} n &= (0.5 \times 0.5 \times 3200 \times 3.841) / (0.05^2 \times (3200 - 1) + 0.5 \times 0.5 \times 3.841) \\ &= 307.328 / (0.0025 \times 3199 + 0.9604) \\ &= 307.328 / 8.9579 \approx 343 \end{aligned}$$

Figure 3: Sample calculation (value substitution)

3.10 PARTICIPANTS RECRUITMENT STRATEGY

Research participants were selected from DPWI, which included various branches such as Construction Management, Facilities Management, Real Estate Management Services, Real Estate Information System, Supply Chain Management, Finance, Corporate Services, Governance, Risk and Compliance, Programme Management Office, Professional Services and Expanded Public Works Programme.

Employees were selected from various hierarchical levels: administrative staff, supervisors, Middle Managers, Senior Managers and executives to ensure representation throughout the organisation. Recruitment was done through departmental official communication channels (emails and WhatsApp) after obtaining approval from the gatekeeper (Director-General) to ensure adherence to DPWI protocols. An invitation letter to recruit participants, which outlined the purpose of the study together with the consent letter, was distributed electronically via email and WhatsApp. Participation was voluntary, and no financial or material incentives were promised or offered. Strict measures were implemented to ensure confidentiality and anonymity, to ensure adherence to the POPIA (2013). Participants were encouraged to honestly and accurately respond to the questionnaire and the purpose of collecting data, which is generating empirical evidence aimed at strengthening the digital leadership practices, promoting innovative work behaviour and enhancing service delivery within the public service.

3.11 DATA COLLECTION INSTRUMENT

The data was collected using a structured and standardised instrument to questionnaire to collect data (refer to **Appendix D**). The questionnaire was administered online using Microsoft Forms, distributed to a South African National Public Service Department responsible for state immovable asset management and infrastructure delivery. The structured questionnaire used was suitable for the quantitative methodology and positivist research because it enabled the systematic collection of standardised data across a large sample, thereby facilitating reliable statistical analysis to test the hypotheses “Digital leadership positively influences innovative work behaviour” (Bryman, Bell & Hirschesohn, 2021:242).

The questionnaire included closed-ended questions that employed Likert scale items (ranging from 1 = strongly disagree to 5 = strongly agree), allowing respondents to indicate the degree to which they agreed or disagreed with each provided statement. The tool was designed to be easy for participants to respond to and to ensure consistency in data, which is suitable for advanced statistical analyses such as factor and regression analysis.

The questionnaire was categorised into 5 Sections as follows:

Section A: Demographic Data

The section collected information such as age, years of service within DPWI, position level and Branch name in line with POPIA (2013).

Section B: Digital Leadership (independent variable)

Digital Leadership: Digital leadership was measured with the six-item scale developed by Zeike *et al.* (2019). These validated scales highlighted how well leaders can share their digital vision, strategy, and the benefits that come with it clearly and openly. For instance, one of the items asked, “How effectively does leadership communicate the advantages of digital transformation to employees?” Digital Leadership: the questions were adapted from Erhan *et al.* (2022) [α 5 0.838] (Questions 7 – 11). Responses were gathered using a 5-point Likert scale, where 1 means “Strongly Disagree” and 5 means “Strongly Agree.” A higher score indicates a stronger commitment to digital innovation from leadership. Cronbach’s alpha for this scale was 0.852, which confirms that this construct is internally consistent.

Section C: Innovative Work Behaviour (Mediator)

Innovative Work Behaviour (IWB) was evaluated using a six-term behavioural frequency scale that was adopted from the work of De Jong & Den Hartog 2010 and Scott & Bruce 1994, as

reflected in the data collection tool. Items measured the degree to which participants created ideas, promoted ideas, solved problems, experimented, and implemented new approaches in their work. Respondents rated on a 6-point scale, with 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Fairly Often, 5 = Very Often, and 6 = Always. Scaling in this manner allowed the research to capture an indication of the frequency with which innovative work behaviours have been demonstrated by employees within the departmental setting. A higher score reflected a stronger engagement in innovative work behaviour, which includes coming up with, promoting, and implementing new ideas that improve work processes and service delivery. Gao & Gao (2024) reported a Cronbach's α of 0.905 for the IWB scale, while Sagheem *et al.* (2025) found reliability coefficients above 0.70, which supports the scale's internal consistency and construct validity.

Section D: Service Quality Dependent (Variable)

Service Quality was measured using a version of the SERVQUAL framework tailored for the public sector. This included key aspects like reliability, responsiveness, assurance, and empathy, all updated to fit the mixed digital and physical service delivery environments that are used today, such as timeliness, responsiveness, consistency, and ease of use. A straightforward 5-point Likert scale was used, where higher scores indicate a better perception of service quality. Recent studies in the public sector have validated these omnichannel service-quality constructs, making them relevant for our context (Walke *et al.*, 2024; Jonkisz *et al.*, 2021). Service Quality was measured using public-sector-adapted SERVQUAL-type items that captured reliability, responsiveness, assurance, and empathy, updated to reflect hybrid digital and physical service delivery contexts (e.g., timeliness, responsiveness, consistency, and ease of use). The same 5-point Likert scale was applied, with higher scores denoting better perceived service quality. Service quality (construct reliability = 0.882; Cronbach's α = 0.895; AVE = 0.53) Reliability (0.796).

3.12 DATA COLLECTION

Before data collection commenced, an application for ethical clearance was obtained from the North-West University Research Ethics Committee (REC) (NWU 00895-25-A-4), which served as a confirmation that the study met all the necessary ethical research standards. This included ensuring voluntary participation, maintaining anonymity, upholding confidentiality, and protecting data, all in line with the ethical guidelines set out by North-West University (2023:15). After securing ethical clearance, formal permission was obtained from the Director-General of the South African national public sector department in charge of infrastructure delivery. The permission letter detailed the study's goals, scope, and ethical protections, which helped to gain

access to the targeted sample = 343, respondents = 161, response rate = 47% spread across nine provinces (Bryman, Bell & Hirschsohn, 2021:134).

Data was collected using a quantitative online survey as the main method. The survey was administered through Microsoft Forms to employees of the DPWI. The questionnaire was in English, the department's official business language, and was designed to take about 30 minutes to fill out. The survey link was shared with employees via departmental electronic communication channels to make sure it was accessible to everyone, whether they were in operational or support roles. Participants could complete the questionnaire whenever it suited them.

The Human Resources Development (HRD) Directorate of DPWI acted as an official gatekeeper, helping with logistical coordination and facilitating access to participants. The HRD division took charge of sending out the survey link to a stratified random sample of selected sample = 343 respondents = 161, response rate = 47% through internal communication platforms like email and official WhatsApp groups. This setup ensured that the process remained neutral, as it kept the researcher out of direct recruitment and communication with participants.

The Microsoft Forms platform allowed for completely anonymous participation, which was crucial for gathering honest and unbiased feedback. At no point was any personally identifiable information collected. All responses were securely stored in an online database that only the researcher could access. Later, the data was downloaded into a password-protected file for analysis. Throughout the data collection process, strict ethical protocols were followed. Participants were made aware of the study's purpose, scope, and the voluntary nature of their involvement before they took part. Informed consent was obtained electronically via the survey link, with clear assurances of anonymity, confidentiality, voluntary participation, and the right to withdraw at any time without any repercussions (Bryman, Bell & Hirschsohn, 2021:242).

Survey responses were automatically gathered by Microsoft Forms and then exported to Microsoft Excel for data cleaning and preparation for statistical analysis. To minimise any potential risks related to the researcher's organisational ties and to maintain the independence of participation, the HRD unit, through a designated HR Development official, handled all recruitment-related communications. Relying solely on online and anonymous data collection methods further diminished the risk of perceived coercion or researcher influence, thereby bolstering the study's credibility and ethical integrity (du Toit, 2021:239).

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3.13 DATA CODING AND ANALYSIS

3.13.1 Data Coding

All the Likert-scale items that measure the main aspects of digital leadership, innovative work behaviour, and perceived service quality maintained their original numerical coding-for example, 1 = Strongly Disagree to 5 = Strongly Agree-as set up on Microsoft Forms (Kotronoulas, Miguel, Dowling, Fernández-Ortega, Colomer-Lahiguera, Bağcıvan, Pape, Drury, Semple, Dieperink & Papadopoulou, 2023:2). The demographic variables of age, years of service, position level, and branch, which had been captured in the questionnaire, were carefully recoded as numeric categories and recorded in a comprehensive codebook for clarity, replicability, and data integrity. Any minor instances of missing data were dealt with through listwise deletion to ensure statistical validity and analytical strength. Full adherence to all the procedures involved in demographic data coding was cautiously addressed, while the ethical and data protection standards, as outlined in the POPIA, (2013), were strictly maintained.

3.13.2 Data Analysis

Data analysis is the process that assists in understanding numerical data derived from a sample. Statistics will always analyse variables; the unprocessed data (numbers) become outcomes or proof (Kotronoulas *et al.*, 2023:2).). The data was cleaned first to eliminate incomplete samples; 162 responses were received; however, one was disqualified, and the data analysed was based on 161 N. The data was captured into an Excel spreadsheet and thereafter exported into IBM SPSS version 29 for analysis. SPSS was used to formulate percentages and frequency tables.

Descriptive statistics were first used to summarise participants' overall perceptions of digital leadership, innovative work behaviour and service quality, providing an initial understanding of how employees rated each construct. Reliability analysis using Cronbach's alpha was then performed to confirm the internal consistency of all measurement scales.

Inferential statistical procedures were subsequently applied to test the study's hypotheses. Pearson correlation analysis examined the strength and direction of associations among the variables and offered preliminary evidence relevant to H₁, which proposed a positive relationship between digital leadership and innovative work behaviour. To formally test this hypothesis, simple linear regression was conducted, assessing whether digital leadership significantly predicts innovative work behaviour. Multiple regression analysis was used to test H₂, which examined whether innovative work behaviour directly influences service quality. Simple linear regression was again applied to test H₃, which explored the direct effect of digital leadership on service quality. Mediation analysis was conducted to test H₄, determining whether innovative work behaviour mediates the relationship between digital leadership and service quality.

3.14 DESCRIPTIVE ANALYSIS

Descriptive statistics were used to profile the sample by summarising demographic variables through frequencies and percentages, which are appropriate for categorical data (Kotronoulas et al., 2023:3). These were presented in tables and graphs to provide a clear overview of participants' characteristics. The purpose of this analysis was solely to describe the sample distribution.

3.15 INFERENTIAL ANALYSIS

Inferential statistical techniques were used to test the hypotheses of this study and answer the research questions by testing whether the relationships among the studied variables were statistically significant. The procedures thus allowed the researcher to draw evidence-based conclusions regarding the impact of digital leadership on innovative work behaviour and service quality among employees in the selected South African Government Department.

Pearson's correlation analysis was used to test the strength and direction of bivariate relationships involving key continuous variables: namely, digital leadership, innovative work behaviour, and service quality. This analysis furnished initial evidence on whether relationships existed in support of hypotheses H₁, H₂, and H₃ at a significance level of $p < 0.05$ (Kotronoulas *et al.*, 2023:6).

The simple linear regression analysis was applied to formally test the hypotheses. Regression Model examines the impact of digital leadership on innovative work behaviour, addressing H₁. Regression Model 2 investigates the direct influence of digital leadership on service quality, thus

addressing H₃. These models enabled the estimation of predictive relationships and the magnitude of influence between variables.

Regression analysis was conducted to ascertain whether digital leadership and service quality are related through innovative work behaviour. This involved the testing of the significance of both the direct and indirect effects to establish if innovative work behaviour was a transmission mechanism between the independent and dependent variables, therefore addressing H₄ (Quesada & Masenge, 2021:411).

3.16 MEASURING INSTRUMENT: VALIDITY, RELIABILITY AND TRUSTWORTHINESS

The structured and standardised online questionnaire was developed using Microsoft Forms. All measurement items were adapted from established and validated scales to ensure conceptual accuracy and suitability. Digital leadership items were adapted from Westerman *et al.* (2014), innovative work behaviour items from Janssen (2001), and service quality items from the SERVQUAL model developed by Parasuraman, Zeithaml & Berry (1988). Using previously validated scales enhanced the credibility of the instrument and ensured comparability with prior studies, while the standardised structure promoted consistency in participant responses.

Data were analysed using IBM SPSS Version 29. Internal reliability was assessed using Cronbach's alpha, with coefficients of $\alpha \geq 0.70$ considered acceptable. All three constructs, digital leadership, innovative work behaviour and service quality met this threshold, indicating satisfactory internal consistency. Content validity was strengthened through the adaptation of recognised measurement scales, and construct validity was supported by the statistical behaviour of the items in descriptive and correlational analysis.

3.17 ETHICAL CONSIDERATION

Ethical considerations are crucial when it comes to research involving human participants. They help protect their rights, dignity, and overall well-being throughout the entire research journey (Bryman, Bell & Hirschsohn, 2021:128). This study took a closer look at how digital leadership impacts innovative work behaviour and perceived service quality in a specific South African government department. While the study was deemed to pose minimal risk, it still involved adult employees, which meant it required careful attention to ethical principles like informed consent, anonymity, confidentiality, voluntary participation, potential psychological risks, and conflicts of interest. All ethical concerns are in line with the POPIA (2013) and the ethical standards set by North-West University (NWU), by obtaining ethical clearance (NWU 00895-25-A-4).

3.17.1 Informed Consent

Informed consent is about ensuring that participants willingly choose to participate in a study after they've been given enough information about what it involves, like its aims, procedures, potential risks, and their rights (Hirschesohn & Faasen, 2021:165). For this study, a digital consent form was shared through Microsoft Forms by the Human Resources (HR) division. The form made it clear what the academic purpose of the research was to write an MBA mini dissertation, how long it would take to complete (about 30 minutes), and emphasised that participation was completely voluntary. It also highlighted that participants could withdraw at any time without facing any penalties, and it explained the steps taken to protect their data and ensure their anonymity (Hirschesohn & Faasen, 2021:170). Consent was considered given when participants clicked on the survey link after reading the consent statement, in line with the ethical guidelines that had been approved. Refer to informed consent form (**Appendix B**).

3.17.2 Confidentiality

To protect the privacy of participants, the system ensured that no identities could be traced back to participants' responses (Hirschesohn & Faasen, 2021:170). Personal information of participants, such as contact details and ID numbers was not required on the survey. Demographic data collected only included age, job category, and years of experience for the purpose of aggregating the data. All data management practices adhered to the guidelines set by POPIA (2013).

3.17.3 Anonymity

The data collection, response storage and analysis process maintained confidentiality by storing the data on the password-controlled Excel spreadsheet (North West University, 2023:15). This approach guaranteed that all information stayed confidential and was used solely for academic purposes.

3.17.4 Voluntary Participation

Those who participated in the research did so on a wholly voluntary basis, in that they were free from any kind of pressure or coercion to join (Hirschesohn & Faasen, 2021:170). The consent form highlighted that participation was entirely optional, and at any stage, one could withdraw from this, and all data relating to that participant would be excluded from further analysis. No kind of incentives or benefits were offered to avoid the possibility of undue influence. The fact that the researcher was not in a line managerial position within the institution was, in addition, established as a further step in minimising perceived concerns with authority and power. Given that the target group is composed entirely of adult employees, parental or guardian consent was not considered.

The data collected was solely used for academic purposes, such as preparing the MBA mini-dissertation and possibly sharing the findings at academic conferences or in peer-reviewed journals. These steps were taken to ensure that the study would be conducted in observance of the tenets of respect, autonomy, beneficence, and justice, all while ensuring that the highest ethical standards were respected throughout the research process.

3.18 CONCLUSION

The chapter detailed the research design methods that were applied to respond to the research questions of the study. The chapter provided information on a research design, which is a positivist paradigm that provides a framework for quantitative and correlational research designs. The chapter explains the sampling methods that were used to select the 343 participants from a total population of 3,200 DPWI employees from the core and support function areas. The tool had a total of 57 questions that were compulsory to respond to, and a 47%.1 response rate was obtained. The data was captured and analysed using IBM SPSS version 29. Chapter Four will focus on the research analysis, present results and analysis of collected data.

CHAPTER 4 RESULTS

4.1 INTRODUCTION

Chapter three provided a comprehensive explanation of research design and methodology that the study adopted (positivist and quantitative) to investigate how digital leadership influences innovative work behaviour and service quality within the Department of Public Works and Infrastructure (DPWI). Chapter Four will present the research findings created from the data collected through the structured questionnaire administered through Microsoft Forms, which was conducted on DPWI employees as a study population from a sample of core and support functions. The results respond directly to the primary research objective, “examining the influence of digital leadership on innovative work behaviour and service quality and the associated hypotheses formulated from the theoretical framework.

Chapter Four presents the empirical results of the study based on the statistical analyses performed on SPSS Version 29, responding directly to the primary research question on how digital leadership influences innovative work behaviour and service quality within the DPWI. Descriptive statistics were conducted to summarise respondents' perception of digital leadership, innovative work behaviour and service quality variables, to set the foundation to understand the constructs. Pearson correlation analysis was conducted to examine the strength and direction of relationships between variables, directly responding to the secondary research question (i) and supporting H₁, which stated that digital leadership positively influences innovative work behaviour.

Simple linear regression analyses were conducted to test H₁, H₂ and H₃. Regression analysis was conducted to address secondary research questions (i) by determining the effect of digital leadership on innovative work behaviour, and secondary research question (iv), does IWB mediate the relationship between digital leadership and service quality. To respond to secondary research question (ii) and test H₄, a mediation analysis was conducted to examine whether innovative work behaviour mediates the relationship between digital leadership and service quality. Profiling of demographics was conducted with frequencies and percentages only.

The results are presented by following a structured analysis process: descriptive statistics summarise participants' perceptions of digital leadership, innovative work behaviour, and service quality. Reliability analysis is performed to assess the internal consistency of the scales. Pearson correlations are used to test the strength and direction of associations among variables. Simple and multiple regression tests direct hypothesised relationships. Mediation analysis is used to test

whether innovative work behaviour acts as a mediator in the relationship between digital leadership and service quality.

4.2 DEMOGRAPHIC CHARACTERISTICS

The first section of the survey distributed to the respondents assessed the demographic characteristics of the respondents. The frequency analysis was conducted on the demographic data as presented in Table 1 below. The results of the analysis revealed that most respondents (52.8%) had an age range between 40 and 54 years. In relation to years of working experience, the results of the analysis indicated that most (46.6%) of the respondents had a working experience of more than 10 years. Moreover, many (40.4%) of the respondents occupied level 2-8 position levels. Lastly, the results of the frequency analysis revealed that 60 out of 161 respondents worked in the construction project management.

Table 1: Respondents' Demographic Characteristics (N=161)

Characteristics	Variable	Frequency	Percentage (%)
Age Range	18 – 25 years	4	2.5
	26 – 39 years	59	36.5
	40 – 54 years	85	52.8
	Above 55 years	13	8.1
Total		161	100.0
Years of Working Experience	Less than 1 year	21	13.0
	1 – 3 years	33	20.5
	4 – 9 years	32	19.9
	10+ years	75	46.6
Total		161	100.0
Position Level	Level 2 – 8	65	40.4
	Level 9 – 12	63	39.1
	Senior Management	30	18.6
	Executive Management	3	1.9
Total		161	100
Construction Project Management		60	37.3
Corporate Services		17	10.6
EPWP		4	2.5

	Facilities Management	6	3.7
	Finance	4	2.5
	Government and Compliance	8	5.0
Branch Working for	Professional Services	30	18.6
	Programme Management Office	8	5.0
	REIS	9	5.6
	REMS	4	2.5
	Supply Chain Management	11	6.8
Total		161	100.0

4.3 DESCRIPTIVE ANALYSIS OF VARIABLES

Descriptive statistics (means and standard deviations) were conducted to analyse the three main variables: digital leadership, innovative work behaviour and service quality. These statistics provided a summary of how respondents scored each construct.

Table 2: Descriptive Statistics for Main Constructs (N = 161)

Construct	Minimum	Maximum	Mean	Std. Deviation
Digital Leadership	1.00	5.00	3.40	1.00
Innovative Work Behaviour	1.00	6.00	4.33	1.17
Service Quality – Employee	3.00	5.00	4.36	0.44
Service Quality – Supervisor	1.00	5.00	3.12	0.43

4.3.1 Digital Leadership

was measured in Section B using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The descriptive results summarise employees' perceptions of digital leadership; the actual effect on innovative work behaviour was examined using regression analysis.

The results indicated that respondents believed the critical concept for the impact of digital leadership was ethical behaviour in information implementation (M = 3.51, SD = 1.001). Over half (60.9%) of the respondents agreed and strongly agreed with the statement that awareness of the

technologies that can be used to improve organisational processes ($M = 3.48$ and $SD = 1.090$) has an impact on digital leadership. Moreover, slightly over half (57.1%) of the respondents agreed and strongly agreed on a clear idea of the structures and processes that are needed for the digital transformation ($M = 3.48$ and $SD = 1.019$). In addition, slightly over half (53.4%) of the respondents indicated agreement and strongly agree that the leader thinks using digital tools is fun ($M = 3.46$ and $SD = 1.107$).

The findings indicate that 57.7% of respondents believe leaders play a crucial role in mitigating resistance to innovations in information technology ($M = 3.44$, $SD = 1.077$). Additionally, 57.2% agree that leaders share personal experiences regarding technological opportunities, enhancing contributions to the learning organisation ($M = 3.43$, $SD = 1.111$). The combined results further indicated that 55.3% of the respondents selected agree and strongly agree that leaders raise employees' awareness about the risks of information technologies ($M = 3.40$ and $SD = 1.074$). Additionally, the combined results revealed that over half (54.7%) of the respondents selected agree and strongly agree when it comes to digital knowledge, my leader is always up to date ($M = 3.40$ and $SD = 1.120$).

The combined results revealed that 54,1% of the respondents selected agreed and strongly agreed that a leader can make others enthusiastic about the digital transformation ($M = 3.37$ and $SD = 1.076$). Some 57.2% of the respondents indicated agreement and strongly agree that the leader is driving the digital transformation forward proactively in our unit ($M = 3.35$ and $SD = 1.131$). Lastly, 44.1% of the respondents agreed and strongly agreed that the leader is a digital expert ($M = 3.22$ and $SD = 1.111$).

Table 3: Descriptive Analysis of Digital Leadership

Variables	Mean	Std. Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<i>Digital Leadership</i>							
My leader finds it enjoyable to use digital tools.	3.51	1.001	6.2	7.5	26.7	48.4	11.2
My boss is a digital specialist.	3.48	1.090	6.8	12.4	19.9	47.2	13.7
In terms of digital expertise, my leader is constantly current.	3.48	1.019	6.2	8.7	28.0	45.3	11.8
My leader is actively advancing the digital transformation in our unit.	3.46	1.107	7.5	9.3	29.8	36.6	16.8
My leader can excite others about digital transformation.	3.44	1.077	6.8	12.4	23.0	45.3	12.4
My leader articulates their personal experiences regarding technological opportunities that will enhance colleagues' contributions to the framework of the learning organisation.	3.43	1.111	7.5	13.0	22.4	43.5	13.7
My leader raises employees' awareness about the risks of information technologies	3.40	1.074	7.5	11.8	25.5	44.1	11.2
My leader raises employees' awareness about the technologies that can be used to improve the organisational processes	3.40	1.120	6.8	15.5	23.0	40.4	14.3
My leader establishes the necessary ethical standards for information implementations in collaboration with all stakeholders.	3.37	1.076	7.5	13.0	25.5	43.5	10.6

My leader assumes an informative role in diminishing resistance to innovations introduced by information technologies.	3.35	1.131	8.7	15.5	18.6	46.6	10.6
My leader articulates their personal experiences regarding technological opportunities that will enhance colleagues' contributions to the framework of the learning organisation.	3.22	1.111	8.1	17.4	30.4	32.9	11.2

4.3.2 Innovative Work Behaviour

Innovative work behaviour was measured in Section C using a 6-point frequency scale (1 = never to 6 = always). The descriptive results summarise how often employees reported engaging in innovative work behaviours.

For innovative work behaviour, the combined results indicated that 57.8% of the respondents selected very often and always to generate ideas or solutions to address problems ($M = 4.62$ and $SD = 1.327$). Moreover, the combined results revealed that over half (55.3%) of the respondents selected very often and always to define problems more broadly to gain greater insight into them ($M = 4.57$ and $SD = 1.274$). Additionally, the combined results revealed that 55.3% of the respondents selected very often and always for implementing changes that seem to be beneficial ($M = 4.49$ and $SD = 1.488$). The combined results indicated that slightly over half (51.6%) of the respondents chose very often and always for experimenting with new ideas or solutions ($M = 4.48$ and $SD = 1.299$).

The descriptive statistics further revealed that slightly less than half (47.2%) of the respondents selected very often and always for recognising opportunities to make a positive difference in their work, department, organisation, or with customers ($M = 4.43$ and $SD = 1.308$). Slightly over half (51.6%) chose very often and always to push ideas forward so that they have a chance to become implemented ($M = 4.39$ and $SD = 1.402$). Moreover, the combined results revealed that slightly over half (52.2%) of the respondents selected very often and always to try to persuade others of the importance of a new idea or solution ($M = 4.35$ and $SD = 1.455$). Additionally, slightly less than half (49.7%) of the respondents selected very often and always to evaluate the strengths and weaknesses of new ideas ($M = 4.34$ and $SD = 1.378$).

The results revealed that slightly less than half (47.2%) of the respondents chose very often and always to take the risk to support new ideas for improving an existing process, technology, product, or service into daily routines ($M = 4.26$ and $SD = 1.408$). Less than half (44.7%) of the respondents selected very often and always to look for opportunities to improve an existing process, technology, product, service, or work relationship ($M = 4.22$ and $SD = 1.360$). Additionally, 44.7% of the respondents chose very often and always to incorporate new ideas for improving ($M = 4.19$ and $SD = 1.463$).

The combined results revealed that slightly less than half (43.4%) of the respondents chose very often and always for test-out ideas or solutions to address unmet needs ($M = 4.19$ and $SD = 1.370$). Moreover, slightly third (36.6%) of the respondents selected very often and always pay attention to non-routine issues in their work, department, organisation, or the marketplace ($M = 4.11$ and $SD = 1.326$). Finally, the combined results revealed that 37.9% of the respondents chose

very often and always for work the bugs out of new approaches when applying them to existing processes, technology, product, or service ($M = 4.02$ and $SD = 1.376$).

Table 4: Descriptive Analysis of Innovative Work Behaviour

Variables	Mean	Std. Deviation	Never	Rarely	Sometimes	Fairly Often	Very Often	Always
<i>Innovative Work Behaviour</i>								
Develop ideas or solutions to resolve issues	4.62	1.327	1.9	5.0	14.9	20.5	23.0	34.8
Broaden the scope of problem definition to attain a deeper understanding of the issues.	4.57	1.274	1.2	3.7	18.6	21.1	24.2	31.1
Implement changes that seem to be beneficial	4.49	1.488	3.1	9.9	13.0	18.6	19.3	36.0
Experiment with new ideas or solutions	4.48	1.299	1.9	5.0	16.8	24.8	23.0	28.6
Notice chances to do well in your work, department, company, or with customers.	4.43	1.308	1.9	3.7	20.5	26.7	17.4	29.8
Advance ideas to give them a chance to be put into practice.	4.39	1.402	3.1	6.8	18.0	20.5	23.0	28.6
Try to persuade others of the importance of a new idea or solution	4.35	1.455	3.7	7.5	19.9	16.8	23.0	29.2
Evaluate the strengths and weaknesses of new ideas	4.34	1.378	2.5	7.5	19.9	20.5	23.6	26.1
Take a chance on new ideas that could make an existing process, technology, product, or service better.	4.26	1.408	4.3	6.2	19.9	22.4	23.0	24.2

Seek out ways to enhance a current procedure, technology, good, service, or working relationship.	4.22	1.360	3.1	6.2	21.1	29.2	15.5	24.8
Incorporate new ideas for improving	4.19	1.463	3.7	11.8	16.1	23.6	19.9	24.8
Test out ideas or solutions to address unmet needs	4.19	1.370	4.3	4.3	24.8	23.0	21.7	21.7
Pay attention to non-routine issues in your work, department, organisation, or the marketplace.	4.11	1.326	2.5	8.1	23.0	29.8	16.1	20.5
Work the bugs out of new approaches when applying them to existing processes, technology, product, or service	4.02	1.376	4.3	9.3	21.7	26.7	20.5	17.4

4.3.3 Service Quality

The fourth and fifth sections of the questionnaire assessed service quality using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The descriptive results summarise employees' and supervisors' perceptions of service quality based on these items.

In relation to employees' service quality, the combined results revealed that 98.0% of the respondents selected agree and strongly agree to treat all customers courteously ($M = 4.49$ and $SD = 0.560$). Moreover, 96.3% of the respondents selected agree and strongly agree for knowledge and ability to answer customers' questions ($M = 4.42$ and $SD = 0.566$). Additionally, the combined results indicated that 97.5% of the respondents chose to agree and strongly agree to provide customers with individual attention ($M = 4.41$ and $SD = 0.542$). 95.6% of the respondents selected agree and strongly agree to give problems all my attention in an effort to solve them speedily ($M = 4.40$ and $SD = 0.574$). The combined results revealed that 96.9% of the respondents chose agree and strongly agree to understand the specific needs of my customers ($M = 4.37$ and $SD = 0.568$).

The results further revealed 94.5% of the respondents selected agree and strongly agree to explain to my customers every step I take to answer their questions ($M = 4.34$ and $SD = 0.582$). Almost all of the respondents (91.3%) chose agree and strongly agree to give prompt service to my customers ($M = 4.34$ and $SD = 0.651$). Additionally, 89.8% of the respondents indicated agreement and strongly agree that behaviour instils confidence in my customers ($M = 4.34$ and $SD = 0.591$). The combined results revealed that 91.9% of the respondents chose agree and strongly agree with the promise to a customer that I will do something by a certain time ($M = 4.29$ and $SD = 0.693$). Lastly, the combined results revealed that 89.4% of the respondents chose agree and strongly agree to perform the service right the first time ($M = 4.16$ and $SD = 0.638$).

Concerning supervisor service quality, the results revealed that 78.3% of the respondents selected agreed and strongly agreed that the supervisor cares about my opinions ($M = 3.98$ and $SD = 0.560$). Moreover, 77.0% of the respondents chose to agree and strongly agree that Help is available from my supervisor ($M = 3.91$ and $SD = 1.048$). Additionally, the combined results indicated that 72.1% of the respondents chose to agree and strongly agree that the supervisor is willing to extend themselves in order to help me perform my job to the best of my ability ($M = 3.86$ and $SD = 1.034$). Additionally, 71.4% of the respondents selected agree and strongly agree that the supervisor cares about my general satisfaction at work ($M = 3.80$ and $SD = 1.024$). The combined results revealed that 70.8% of the respondents chose to agree and strongly agree that the supervisor really cares about their well-being ($M = 3.80$ and $SD = 1.073$).

Moreover, the combined results indicated that 70.8% of the respondents selected agree and strongly agree that the supervisor takes pride in my accomplishments at work ($M = 3.75$ and $SD = 1.080$). Additionally, over half (67.1%) of the respondents selected agree and strongly agree that the supervisor strongly considers my goals and values ($M = 3.71$ and $SD = 1.021$). The results further indicated that 65.2% of the respondents chose to agree and strongly agree that the supervisor tries to make my job as interesting as possible ($M = 3.64$ and $SD = 1.076$). Slightly over half (52.1%) of the respondents selected agree and strongly agree that the supervisor is willing to help me when I need a special favour ($M = 3.46$ and $SD = 1.067$). Additionally, slightly less than a third (23.0%) of the respondents chose to agree and strongly agree that the supervisor shows very little concern for me ($M = 2.43$ and $SD = 1.254$).

Moreover, less than a third (17.4%) of the respondents selected agree and strongly agree that a supervisor disregards my best interests when he or she makes decisions that affect me ($M = 2.42$ and $SD = 1.171$). Less than a third (16.8%) of the respondents chose to agree and strongly agree that the supervisor fails to appreciate any extra effort from me ($M = 2.28$ and $SD = 1.210$). Moreover, 16.2% of the respondents selected agree and strongly agree that even if I did the best job possible, my supervisor would fail to notice ($M = 2.25$ and $SD = 1.216$). Less than 13.6% of the respondents chose to agree and strongly agree that if my supervisor could hire someone to replace me at a lower salary, he or she would do so ($M = 2.21$ and $SD = 1.148$). Additionally, slightly less than a third (14.3%) of the respondents selected agree and strongly agree that a supervisor would ignore any complaint from me ($M = 2.20$ and $SD = 1.102$). Finally, less than a third (14.9%) of the respondents chose to agree and strongly agree that if given the opportunity, my supervisor would take advantage of me ($M = 2.19$ and $SD = 1.141$).

Table 5: Descriptive Analysis for Digital Leadership on Service Quality (N = 161)

Variables	Mean	Std. Deviation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Employee's Service Quality							
I treat all customers with courtesy.	4.49	0.560	0.0	0.6	1.2	46.4	51.6
I have the knowledge and skills to answer customer questions.	4.42	0.566	0.0	0.0	3.7	50.3	46.0
When a customer has a problem, I provide him or her with personalised attention.	4.41	0.542	0.0	0.0	2.5	54.0	43.5
When problems arise, I devote all of my attention to resolving them as quickly as possible.	4.40	0.574	0.0	0.0	4.3	50.9	44.7
I can understand the specific needs of my customers.	4.37	0.568	0.0	0.6	2.5	55.9	41.0
I always explain to my customers each and every step I take to answer their questions, e.g. why a call needs to be transferred, etc.	4.34	0.582	0.0	0.0	5.6	54.7	39.8
I give prompt service to my customers.	4.34	0.651	0.0	0.6	8.1	48.4	42.9
My behaviour instils confidence in my customers.	4.34	0.591	0.0	0.0	6.2	54.0	39.8
In my current job, when I promise a customer that I will do something by a certain time, I do so.	4.29	0.693	0.6	1.2	6.2	52.8	39.1
I perform the service right the first time.	4.16	0.638	0.6	0.0	9.9	62.1	27.3

Supervisor Service Quality							
My supervisor cares about my opinions	3.98	0.922	3.1	3.1	1.,5	49.7	28.6
Help is available from my supervisor when I have a problem	3.91	1.048	5.6	4.3	13.0	47.8	29.2
My supervisor is willing to extend themselves to help me perform my job to the best of my ability	3.86	1.034	4.3	5.6	18.0	43.5	28.6
My supervisor cares about my general satisfaction at work	3.80	1.024	4.3	6.8	17.4	47.2	24.2
My boss truly cares about my health.	3.80	1.073	5.6	6.2	17.4	44.7	26.1
My boss is proud of what I've done at work, and they think a lot about my goals and values.	3.75	1.080	7.5	3.7	18.0	48.4	22.4
My boss tries to make my work as interesting as they can, and my boss is okay with helping me out when I need a special favour.	3.71	1.021	5.0	6.2	21.7	46.6	20.5
My boss doesn't care about me at all.	3.64	1.076	7.5	5.0	22.4	46.6	1.6
When my boss makes choices that affect me, they ignore what's best for me.	3.46	1.067	5.6	11.2	31.1	36.0	1.1
Any extra work I do is not appreciated by my boss.	2.43	1.254	2.7	34.8	15.5	14.9	8.1
My boss truly cares about my health.	2.42	1.171	23.6	35.4	23.6	9.9	7.5
My boss is proud of what I've done at work, and they think a lot about my goals and values.	2.28	1.210	28.6	40.4	14.3	8.1	8.7
Even if I did the best job possible, my supervisor would fail to notice	2.25	1.216	30.4	38.5	14.9	7.5	8.7
If my supervisor could hire someone to replace me at a lower salary, he or she would do so	2.21	1.148	29.8	39.8	16.8	6.8	6.8
My supervisor would ignore any complaint from me	2.20	1.102	28.0	42.9	14.9	9.3	5.0
If given the opportunity, my supervisor would take advantage of me	2.19	1.141	31.1	39.8	14.3	9.3	5.6

4.4 RELIABILITY OF THE MEASUREMENT INSTRUMENT

For this study, Cronbach's alpha was utilised to measure the reliability of the data collected from questionnaires. "Cronbach's alpha reliability is one of the most widely used measures of reliability in the social and organisational sciences", as asserted by Bonett and Wright (2015). Moreover, the study carried out by Pinheiro *et al.* (2015) indicated that the Cronbach's value ranges between 0 and 1, with one being the greatest reliability. Moreover, the study revealed that a Cronbach value less than 0.5 is unacceptable, a Cronbach's value between 0.6 and 0.5 is poor, a Cronbach's value between 0.6 and 0.7 is questionable, a Cronbach value between 0.7 and 0.8 is acceptable, a Cronbach value between 0.8 and 0.9 is good, and a Cronbach value more than 0.9 is excellent. The results for Cronbach's alpha revealed values of more than 0.500 for all variables. Consequently, the results for reliability deemed the collected data adequate and acceptable.

Table 6: Reliability of the Measurement Instrument

Construct	Cronbach's Alpha (α)	No. of Items	Reliability Interpretation
Digital Leadership	0.955	11	Excellent
Innovative Work Behaviour	0.971	14	Excellent
Employee Service Quality	0.902	10	Excellent
Supervisor Service Quality	0.631	16	Questionable but Acceptable for Exploratory Behavioural Research

4.5 CORRELATION ANALYSIS

To study the strength and direction of linear relationships among digital leadership, innovative work behaviour, and service quality, correlation analysis was performed. Table 7 describes the Pearson's correlation coefficients for the study variables. This correlation matrix provides preliminary evidence of the associations that were later tested using regression and mediation analysis.

Table 7: Pearson Correlation Matrix for Study Constructs (N = 161)

Construct	Digital Leadership	Innovative Work Behaviour	Service Quality (Employee)	Service Quality (Supervisor)
Digital Leadership	1	0.410	0.327	0.194
Innovative Work Behaviour	0.410	1	0.354	0.227
Service Quality (Employee)	0.327	0.354	1	0.379
Service Quality (Supervisor)	0.194	0.227	0.379	1

4.6 HYPOTHESIS TESTING

To test the hypotheses of this study by examining the predictive relationships among digital leadership, innovative work behaviour, and service quality, simple linear regression analysis was employed. Regression was selected because all variables were measured on continuous Likert scales, and the objectives of the research required a determination of the degree to which one variable predicts changes in another. This analytical approach offers both significance and strength for each relationship, thereby providing empirical evidence to support or refute the hypotheses proposed. The results of the regression analyses are presented in sections that follow for each hypothesis.

4.6.1 H₁: Effect of Digital Leadership on Innovative Work Behaviour

Table 8 presents the model summary for digital leadership, which positively influences innovative work behaviour. The results revealed that $R = 0.563$ for digital leadership positively influences innovative work behaviour, which indicated that there is a moderate linear relationship between digital leadership and innovative work behaviour. Moreover, the results presented

Table 8: Digital Leadership positively influences innovative work behaviour

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	,563 ^a	,316	,312	,97120
a. Predictors: (Constant), Digital Leadership				

Table 9 shows that the ANOVA for digital leadership positively influences innovative work behaviour. The ANOVA results for digital leadership in relation to innovative work behaviour revealed that the significant value (p-value) is less than 0.001, which shows that there is a statistically significant difference between digital leadership and innovative work behaviour.

Table 9: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.437	1	69.437	73.616	<,001 ^b
	Residual	149.974	159	,943		
	Total	219.411	160			
a. Dependent Variable: Innovative Work Behaviour						
b. Predictors: (Constant), Digital Leadership						

Table 10 shows the coefficient results for digital leadership influence towards innovative work behaviour. The results show that sig. Value (p-value) is less than 0.001, which indicates that digital leadership is a significant predictor of innovative work behaviour. Additionally, the results revealed that B coefficient = 0.731, which indicates that digital leadership positively influence innovative work behaviour. Therefore, the first hypothesis statement of this study is supported, which states that digital leadership positively influence innovative work behaviour.

Table 10: Coefficients Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound

1	(Constant)	1.839	,301		6.118	<,001	1.245	2.432
	Digital Leadership	,731	,085	,563	8.580	<,001	,563	,899
a. Dependent Variable: Innovative Work Behaviour								

4.6.2 H₂: Innovative Work Behaviour positively influences service quality

The third research question sought to ascertain the degree to which innovative work behaviour impacts service quality in the selected South African government department. The hypothesis statement, "Innovative work behaviour positively influences service quality," was developed in answering this research question. Simple linear regression analysis was conducted to test whether the innovative behaviours of employees, such as idea generation, problem-solving, and continuous improvement, significantly predicted the service quality outcomes.

The positive B-value (0.088) confirms that increases in innovative work behaviour predict increases in perceived service quality. The p-value (0.009) < 0.05 confirms statistical significance.

Table 11: Regression Analysis

Model	Unstandardised Coefficients (B)	Std Error	Standardised Coefficients (Beta)	t-value	Sig. (p-value)
Constant	3.792	0.124	-	30.521	<0.001
IWB	0.088	0.33	0.236	2.661	0.009
Dependent Variable					

4.6.3 H₃: Digital Leadership Directly Influences Service Quality in the Public Sector

The third research question focused on the extent to which digital leadership directly influence service quality in the public sector. To assess the question, the hypothesis statement was formulated, which indicated that digital leadership has a direct positive effect on service quality. Consequently, simple linear regression was utilised to assess whether digital leadership has a direct positive effect on service quality.

Table 12 presents a model summary for digital leadership that has a direct positive effect on service quality. The results revealed that R = 0.334 for digital leadership direct positive effect on service quality, which indicated that there is a weak relationship between variables. Moreover, the results indicated that R² = 0.111, which represents that there is 11.1% variance between digital

leadership and service quality. The results further revealed that the adjusted R-squared and std. Errors of estimate are 0.106 and 0.413, respectively, whereby std. The error of estimate shows it is a good model.

Table 12: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	,334 ^a	,111	,106	,41260
a. Predictors: (Constant), Digital Leadership				

Table 13 presents the ANOVA results for digital leadership direct positive effect on service quality. The ANOVA results for digital leadership direct positive effect on service quality, indicating that sig. Value (p-value) was less than 0.001, which shows that there is a statistically significant difference between digital leadership and service quality.

Table 13: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.390	1	3.390	19.912	<,001 ^b
	Residual	27.068	159	,170		
	Total	30.458	160			
a. Dependent Variable: Employee's Service Quality						
b. Predictors: (Constant), Digital Leadership						

Table 14 presents the coefficient results for digital leadership direct positive effect on service quality. The coefficient results revealed that sig. Value (p-value) is less than 0.001, which indicates that digital leadership is a predictor of service quality. The results indicated that the value of B = 0.130, which indicates that digital leadership has a direct positive effect on service quality. Therefore, the hypothesis for this study was supported, which stated that digital leadership direct positive effect on service quality.

Table 14: Coefficient Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.792	,124		30.521	<,001	3.546	4.037
	Innovative Work Behaviour	,130	,028	,349	4.697	<,001	,075	,185
a. Dependent Variable: Employee's Service Quality								

4.6.4 H₄: Innovative Work Behaviour Mediates the Relationship Between Digital Leadership and Service Quality

The second research question focused on “Does innovative work behaviour mediate the relationship between digital leadership and service quality?” To investigate the question, the hypothesis statement was formulated as “Innovative work behaviour mediates the relationship between digital leadership and service quality”. Therefore, mediation analysis was utilised to perform the analysis for this section of the study.

Table 15 below presents the mediation analysis results for Innovative work behaviour mediates the relationship between digital leadership and service quality. The analysis was executed to determine whether innovative work behaviour mediates the relationship between digital leadership and service quality. The first mediation analysis revealed that digital leadership predicted service quality with $B = 0.161$, $t = 2.661$ and $p < 0.009$. The results further revealed that the second mediation analysis indicated that digital leadership significantly predicted the innovative work behaviour with ($B = 0$. $t = 8.850$ and $p < 0.001$).

The third mediation analysis indicated that both digital leadership and innovative work behaviour were predictors of service quality. Moreover, innovative work behaviour significantly predicted the service quality with ($B = 0.088$, $t = 2661$ and $p = 0.009$), while the effect of leadership was reduced but remained significant with ($B = 0.161$, to $B = 0.097$) but remained statistically significant ($t = 2.262 = p < 0.025$). These results reflect that part of digital leadership on service quality operates indirectly through its influence on innovative work behaviour. The indirect effect of digital leadership on service quality through innovative work behaviour was $B = 0.064$, which indicates partial mediation.

Table 15: Mediation Analysis

Regressions	Predictor	B	SE	Beta	t	Sig. (p-value)
1 – Total Effect (path c)	DL	,161	,036	0.334	4.462	<,001
2 Path a	DL	,731	,085	,563	8.850	<,001
3 – Path c direct effect	DL	,097	,043	,201	2.262	,025
3 Path b	IWB	,088	,033	,236	2.661	,009
Indirect Effect	DL – IWB - QS	0.064	-	-	-	Partial Mediation

For this study, Cronbach's alpha was utilised to measure the reliability of the data collected from questionnaires. "Cronbach's alpha reliability is one of the most widely used measures of reliability in the social and organisational sciences", as asserted by Bonett and Wright (2015). Moreover, the study carried out by Pinheiro *et al.* (2015) indicated that the Cronbach's value ranges between 0 and 1, with one being the greatest reliability. Moreover, the study revealed that a Cronbach value less than 0.5 is unacceptable, a Cronbach's value between 0.6 and 0.5 is poor, a Cronbach's value between 0.6 and 0.7 is questionable, a Cronbach value between 0.7 and 0.8 is acceptable, a Cronbach value between 0.8 and 0.9 is good, and a Cronbach value more than 0.9 is excellent. The results for Cronbach's alpha revealed values of more than 0.500 for all variables. Consequently, the results for reliability deemed the collected data adequate and acceptable.

4.6.5 Alignment of Findings with Conceptual Framework

The empirical findings of this study were interpreted in relation to the proposed conceptual framework presented in Chapter Two (Figure 1). The framework postulated that digital leadership influences innovative work behaviour, which in turn affects service quality, with innovative work behaviour acting as a mediating variable.

The regression results confirmed that digital leadership has a significant positive effect on innovative work behaviour, thereby supporting the first path of the framework (H_1). Furthermore, innovative work behaviour was found to have a significant positive influence on service quality, validating the second relationship proposed in the model (H_2). The direct effect of digital leadership on service quality was also statistically significant, confirming the third pathway (H_3).

In addition, the mediation analysis demonstrated that innovative work behaviour partially mediates the relationship between digital leadership and service quality. This finding supports the indirect pathway proposed in the conceptual framework (H₄). The presence of both significant direct and indirect effects indicates that digital leadership influences service quality both independently and through innovative work behaviour.

The results provide empirical support for the proposed conceptual framework, confirming that digital leadership enhances innovative work behaviour, which subsequently improves service quality within the Department of Public Works and Infrastructure. The validated framework, therefore, serves as a reliable representation of the relationships among the study variables

Based on the results of the regression and mediation analyses, a revised conceptual framework is presented in **Figure 4**. The framework illustrates the confirmed relationships between digital leadership, innovative work behaviour, and service quality. The findings demonstrate that digital leadership has a significant direct effect on innovative work behaviour and service quality, while innovative work behaviour partially mediates this relationship.

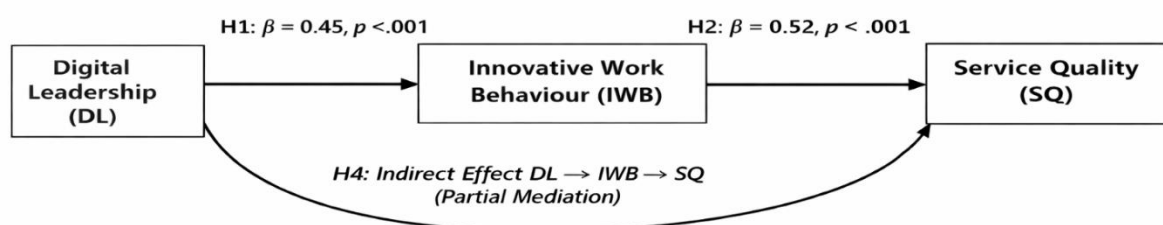


Figure 4: Revised Conceptual Framework Based on Empirical Findings

4.7 CONCLUSION

This chapter presented the empirical results derived from the quantitative data collected from employees within the Department of Public Works and Infrastructure. It began with an overview of the demographic characteristics of the respondents, highlighting distributions across age groups, years of service, position levels, and branches to provide context for the sample's representativeness. Following this, detailed descriptive analyses were conducted for each key construct: digital leadership, innovative work behaviour, and perceived service quality, including item-level insights into employees' perceptions and responses.

The reliability of the measuring instruments was assessed, confirming strong internal consistency for all scales. Descriptive statistics for the overall constructs were then outlined, along with evaluations of data normality to support subsequent parametric tests. Correlation analyses revealed positive relationships among the variables, offering preliminary evidence for the hypothesised links. Regression analyses were performed to test the direct effects proposed in the hypotheses, while a mediation analysis explored the indirect pathways. The results provided empirical support for the study's objectives. The next chapter discusses these findings in relation to the research objectives, draws conclusions, and provides recommendations.

CHAPTER 5 : SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The primary research objective was to examine the influence of digital leadership on innovative work behaviour and service quality within a selected South African Government Department. The secondary research objectives were to evaluate the influence of digital leadership on employees' innovative work behaviour; to determine the effect of innovative work behaviour on service quality; to assess the direct influence of digital leadership on service quality, and to examine whether innovative work behaviour mediates the relationship between digital leadership and service quality within the DPWI.

To attain the study objectives, Chapter one outlined the background and the research problem. Chapter two provided a depth literature review to determine what has been studied and what research gaps exist. Chapter three provided a comprehensive review of the research design and methods adopted for the study. Chapter four focused on analysing and interpreting the data collected, which will serve as empirical evidence to respond to the research questions and confirm the hypotheses.

Chapter five provides a synthesis of the main findings of the study, informed by the statistical analysis presented in Chapter four. The chapter starts by summarising the findings of each hypothesis tested through descriptive statistics, correlation analysis, and regression modelling. These analyses showed the extent to which digital leadership predicted innovative work behaviour and service quality, and how innovative work behaviour mediated these outcomes. From these findings, conclusions are drawn regarding how the findings contribute to or contradict the existing body of literature and how they contribute to the greater understanding of digital transformation in the South African public sector. Further, this chapter makes recommendations to improve the capability of digital leadership to engender innovative work behaviour, which in turn would enhance service delivery within the DPWI. The last part of the chapter deals with the limitations of the study and further areas of research. The findings are discussed below, with references to the statistical results from Chapter Four and linkages to theoretical frameworks and prior studies cited in the literature review.

5.2 SUMMARY OF FINDINGS

5.2.1 H₁: Digital Leadership positively influences Innovative Work Behaviour

The results responded to the first research question, “What is the effect of digital leadership on Innovative Work Behaviour?” Simple linear regression confirmed that there is a positive effect of digital leadership on innovative work behaviour ($R=0.563$; $p < 0.001$). The outcome of 31.6% of the variance in IWB, and the regression coefficient ($B = 0.731$) confirmed that higher digital leadership is associated with innovative work behaviour. The findings are consistent with Nuryadin *et al.* (2023:92) study, which suggested that digital leadership foster innovation behaviour through clear strategic direction, communication of the vision and empowerment of employees. The Job Demand Resource Theory emphasise that the leadership is a critical role player in supporting the digital transformation within the organisation and creating a conducive environment (Demerouti & Bakker, 2023:211).

The results further align with Social Exchange Theory, which suggests that when employees view leadership as a supportive structure, they will, in return, respond in a positive, innovative work behaviour (Yang *et al.*, 2025:8). Enabling digital capability and supporting idea sharing, which confirms the finding of the study conducted by Erhan *et al.* (2022:6). The results also agree with a study conducted by Ugroho *et al.* (2025:243), which further stressed that leadership-driven support increases knowledge sharing, which is considered to raise innovation frequency. The results confirmed the findings of the study conducted by Melamane (2023:10) that digital leadership serves effectively for meeting rapid technological changes so that employees adopt creative solutions critical to organisational performance.

Hadi *et al.* (2023:80) found a non-significant relationship between digital leadership and innovative work behaviour, showing that contextual barriers, like a lack of digital preparedness, may weaken the power of leadership. Sudibjo & Prameswari (2021:4) found a negative coefficient of leadership to IWB in environments where innovation is not structurally supported. These contradictions are seemingly context-specific and do not apply to this study, given that the DPWI is presently undergoing structured digitalisation supported by digital capability-building programmes, modernised workflows, and leadership-driven change initiatives. As such, these enabling conditions strengthen the positive effect of the digital leadership, thus captured through the high regression coefficient, ensuring the relationship is practical and theoretically sound. Based on the results, H₁ is accepted.

5.2.2 H₂: Innovative Work Behaviour has a direct positive influence on service quality

The regression analysis results demonstrated that innovative work behaviour significantly influences service quality ($B = 0.088$; $p = 0.009$). These findings suggest that employees who engage in creating problem-solving, idea generation, and continuous improvement behaviours directly improve service delivery within the public sector. The result of the study is consistent with Kousina & Voudouris' (2023:1280) study, which affirms that innovative work behaviour practice by the employees plays a critical role in the public sector to modernise the process and systems to improve responsiveness and transparency, which increases citizens' satisfaction index.

The results support the study conducted by Ingsih *et al.* (2024:3), who found that innovation-driven behaviours improve operational processes and elevate overall service performance in organisations undergoing digital transformation. Melamane (2023:10) noted that public-sector innovation enhances the capacity of institutions to meet evolving service demands by embedding new processes and leveraging digital tools, which improves consistency and reliability in service delivery. Gao & Gao (2024:20) highlighted that when public-sector employees engage in innovative problem-solving, organisational performance improves through better workflow management, increased accuracy, and enhanced service turnaround times. These studies reinforce the notion that innovative behaviours serve as powerful drivers of improved service quality. The SERVQUAL model supports this relationship by emphasising that employees' behaviour is vital to ensure reliability and empathy, which contribute to effective service delivery. The study results supported H₂.

5.2.3 H₃: Digital Leadership has a direct positive influence on Service Quality

The third research question examined “to what extent does digital leadership directly influence service quality?” Regression analysis results demonstrated that digital leadership had a significant, though modest, positive effect on service quality ($R=0.334$; $R^2 = 0.111$; $p < 0.001$). The coefficient ($B = 0.130$) confirmed that digital leadership has a direct influence on service quality. However, the magnitude is weaker than its influence on innovative work behaviour.

The results align with the study conducted by Galushi & Malatjie (2022:120), which revealed that digital leadership improves service delivery through modernising processes to improve efficiencies. As the SERVQUAL model emphasises reliability, responsiveness and assurance as critical elements of service quality (Frank *et al.*, 2020:876). Digital leadership improves service delivery in the public sector. In the Public Sector, digital leadership plays a critical role in implementing an effective digital strategy that can survive bureaucratic systems (Shibambu & Ngoepe, 2024:66).

The study conducted by de Paula *et al.* (2022:44) contradicts these findings and states that leadership does not clearly translate into improved service quality because the mechanisms linking leadership and service behaviour remain ambiguous. On the contrary, the DPWI context reflects an active digital transformation drive that is supported by capacity-building programs, upgraded systems, and leadership commitment to modernisation. Under such enabling conditions, these digital leadership behaviours are able to affect service quality in a direct manner, albeit the effect size being rated as moderate. Based on the statistical findings and conformity with the literature reviewed, H₃ is therefore accepted.

5.2.4 H₄: Innovative Work Behaviour (IWB) mediates the relationship between Digital Leadership and Service Quality

The mediation analysis demonstrated a partial mediation with an indirect effect of $B = 0.064$. Digital leadership significantly predicted innovative work behaviour ($B = 0.731$; $p < 0.001$), and both digital leadership and innovative work behaviour significantly predicted service quality ($p < 0.05$). The direct effect of digital leadership on service quality decreased from $B = 0.161$ to $B = 0.097$ when innovative work behaviour was included, while remaining significant. The results demonstrated that part of digital leadership's influence on service quality operates through enhanced innovative work behaviour, consistent with the findings of the study conducted by Öngel *et al.*, (2024:5). As per JD-R Theory, leadership provides resources that stimulate innovation, which translates into improved organisation performance and service quality (Ye, 2025:6). Social Exchange Theory suggest that positive leader-employee relationship foster positive behaviour that enhance organisation performance.

These contradictory findings notwithstanding, results from this study show clear evidence that innovative work behaviour serves as a meaningful conduit through which digital leadership enhances service quality in the context of the DPWI. Although previous research, such as Tan, Van Dun and Wilderom (2021) and Groselj *et al.* (2021), has emphasised that mediation effects may fail or become inconsistent in contexts where leadership does not sufficiently stimulate innovation, or when employees lack sufficient support, the opposite has been shown in this study. Structured digital transformation initiatives, capability development driven at the leadership level, and an enabling organisational climate are present, which allowed innovative behaviour to flourish and translate into improved service outcomes. The findings therefore confirm that, in this environment, innovative work behaviour operates as a strategic mechanism that partially mediates the relationship between digital leadership and service quality and as such provides strong support for H₄.

5.3 RESULTS FINDINGS CONCLUSION

Digital Leadership is crucial for fostering innovative work behaviour in DPWI. Leaders with strong digital competencies provide a strong digital transformation strategic direction, which motivates the employees to innovate. Digital Leadership contributes directly and indirectly to improved service delivery. However direct effect is modest, the combined direct and indirect contributions are meaningful in a public service context, which is characterised by bureaucratic systems. Innovative Work Behaviour is a critical organisational resource. An employee who engages in innovation significantly contributes towards improved service delivery in the public service. Partial mediation highlights that building an innovative workforce is critical for capitalising on the digital leadership. This demonstrates the importance of collaborative efforts between leadership and employee engagement to ensure an effective digital transformation.

5.4 LIMITATIONS OF THE RESEARCH

This study was limited to one national department, which restricts generalisability across the public sector, especially provincial government departments. The data were collected through self-report questionnaires, which may introduce response bias. Cross-sectional design limits the determination of causality; the study adopted a quantitative methodology, which prevented qualitative insights which could deepen understanding of contextual barriers.

5.5 MANAGERIAL IMPLICATIONS

The following implications arise for departmental leadership: digital leadership development must be scaled beyond senior management and extended to middle managers and to junior officials. Innovation should be institutionalised through the Human Resources Development Strategy that customises development interventions to each branch and promotes idea-creating platforms that will stimulate innovative behaviour, and a recognition and reward system to motivate innovative work behaviour. To improve quality services, leadership should prioritise digitalising department processes, promote data-driven decision-making and set citizen-centric performance targets (in line with Zerva *et al.*, 2024). The department should develop a digital strategy and embed a digital culture to reduce maturity gaps across branches.

5.6 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the findings of this study, the following recommendations are proposed to enhance digital leadership, innovative work behaviour, and service quality within the Department of Public Works and Infrastructure (DPWI):

- i. **Strengthening Digital Leadership Capacity:** It is recommended that DPWI implement structured digital leadership development programmes aimed at enhancing leaders' technological competence, strategic digital thinking, and change management capabilities. Such programmes should focus on equipping managers with the skills required to drive digital transformation and support employees in adopting innovative work practices.
- ii. **Promoting Innovative Work Behaviour:** DPWI should establish formal mechanisms to encourage and reward innovative work behaviour among employees. This may include the introduction of innovation incentive schemes, idea-sharing platforms, and recognition programmes that acknowledge employees who contribute creative solutions to organisational challenges.
- iii. **Enhancing Digital Infrastructure and Resources:** Management should prioritise investment in modern digital infrastructure, including reliable information systems, secure data platforms, and appropriate software tools. Improved access to digital resources will enable employees to perform their duties more efficiently and improve service delivery outcomes.
- iv. **Fostering a Supportive Organisational Culture:** It is recommended that DPWI promotes a supportive organisational culture that encourages collaboration, knowledge sharing, and open communication. Leaders should create an environment in which employees feel psychologically safe to express ideas, experiment with new approaches, and engage in continuous learning.
- v. **Integrating Digital Leadership into Performance Management:** Digital leadership competencies should be incorporated into performance appraisal and promotion criteria. This will ensure that leaders are held accountable for driving innovation, supporting employee development, and improving service quality through digital initiatives.
- vi. **Continuous Monitoring and Evaluation of Service Quality:** DPWI should implement regular monitoring and evaluation systems to assess service quality performance. Feedback from service users and employees should be systematically collected and used to inform continuous improvement strategies.
- vii. **Capacity Building and Skills Development:** Ongoing training programmes focusing on digital skills, data management, and customer service should be introduced for employees at all

levels. This will strengthen institutional capacity and support the effective implementation of digital transformation initiatives.

- viii. Recommendations for Future Research: Future studies should adopt longitudinal research designs to examine changes in digital leadership and innovative work behaviour over time. Mixed-method approaches may also be employed to provide deeper insights into employees' experiences and perceptions. Furthermore, comparative studies across different government departments are recommended to enhance the generalisability of findings.

5.7 CONCLUSION

Theoretically, this study advances the understanding of digital leadership in public sector digital transformation by empirically validating a mediated model in an under-researched African context. It integrates Digital Leadership Theory (Zhu, 2022) with innovative work behaviour frameworks (Kousina & Voudouris, 2023) and SERVQUAL (Parasuraman *et al.*, 1988), demonstrating how digital competencies foster creativity and service excellence. The findings contribute to the literature gap identified by Adie *et al.* (2024) on distinguishing digital leadership from traditional styles and its evaluation in public administration. Practically, the results underscore that DPWI's digitalisation strategy can be enhanced by strengthening leadership capabilities, particularly in fostering innovation to improve service delivery amid 4IR challenges (Manda, 2021:309). The study concludes that investing in digital leadership is essential for achieving citizen-centred, efficient public services in South Africa, aligning with SDG 8 and the ISAD Plan (Galushi & Malatji, 2022).

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