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Senior Managers' perception of their role in facilitating digital transformation in the public sector – South Africa

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Senior Managers' perception of their role in facilitating digital transformation in the public sector – South Africa

Emanuel Mmuelli Mosia

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business

Johannesburg, 2023

ABSTRACT

Digital transformation is a new phenomenon in the public sector. Previous studies have also found that public sector is performing poorly compared to private sector in their endeavours to transform. The study was intended to establish how senior managers perceive their role in facilitating digital transformation of the Department, excluding the actual assessment of digital maturity. The study drew guidance from Unified Model of Digital Maturity and Dynamic Capabilities Framework which both demonstrate the role of senior managers in the rapid changing environment due to technological disruptions. The study used semi-structured interviews to collect data from the population of 386 senior managers, where 15 senior managers were interviewed either face-to-face or virtually. The study finds that senior managers understanding of their role in facilitating digital transformation is fair to average. Their understanding of digital transformation is a simple switch from paper to paperless. Additionally, silo approach was found to be one of the impeders of digital transformation in the Department. The Department should be developing digital transformation strategy to guide the senior managers, coalesce all the efforts and be intentional in investing in digital transformation of the Department.

KEYWORDS

Digital transformation; Digitalisation; Public Sector; Senior Managers; Leadership; Innovation.

DECLARATION

I, Emanuel Mmuelli Mosia, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Emanuel Mmuelli Mosia Signature: EM Mosia

Signed at Bloemfontein

On the 20 day of November 2023.

DEDICATION

I want to dedicate this to my mother, Ntahli Paulinah Mosia, who has been fighting throat cancer since 2020 and being “in and out” of hospital till date. Mother you have indeed shown immeasurable strength and resilience under difficult and painful situation. We thank God for the life. We thank the Bloemfontein Medi Clinic staff for all their relentless efforts to reverse the damages of cancer. I also dedicate this to my grandmother - cum - mother, Tshehlana Elizabeth Lesia, who regrettably passed on in May 2023. I know you would have loved to celebrate the milestone with me. May your soul continue to rest in eternal peace “Mmangwane”. My source of strength and happiness, my soft-spoken wife and confidante, Thakane Maria Mosia, I dedicate the achievement to you Senati. Finally, the apple of my eye, Katleho “Lady K” Mosia. Thanks to you all ladies.

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A heartfelt thank you and appreciation to my family, especially my wife (Thakane Mosia) who held the fort at the home front and my daughter (Katleho Mosia); they provided mental strength and support while I embarked on my academic journey.

Thanks to my supervisor, Professor Leona Craffert, for all the support, patience, guidance, prompt feedback and availing herself throughout the project.

The Department of Agriculture, Land Reform and Rural Development and all the Senior Managers who contributed towards the achievement of the research objectives.

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LIST OF ACRONYMS

Abbreviation/Acronym	Explanation
DALRRD	Department of Agriculture, Land Reform and Rural Development
DM	Digital Maturity
DG	Director General
DX	Digital Transformation
ICT	Information Communication and Technology
IT	Information Technology
MTSF	Medium Term Strategic Framework
NDP	National Development Plan
PSSC	Provincial Shared Services Centre
RSSC	Regional Shared Services Centre
RSA	Republic of South Africa
SITA	State Information Technology Agency
SL	Salary Level
SMS	Senior Management Services
VRIN	Valuable, Rare, Imperfectly Imitable, Non-Substitutable

CHAPTER 1: INTRODUCTION

1.1 Statement of purpose

This qualitative study explores Senior Managers' perception of their role in facilitating digital transformation in the public sector in South Africa.

1.2 Background of the study

The Department of Agriculture, Land Reform and Rural Development's existence finds expression in Section 25, 26 and 27 of the Constitution of the Republic of South Africa (Constitution of the Republic of South Africa (Act 108 of 1996). According to Public Service Act, (103 of 1994), Section 7(2)(a), the Department of Agriculture, Land Reform and Rural Development (DALRRD) is a national department within the South African public service. It has nine provincial offices referred to as Provincial Shared Services Centres (PSSC) and district offices in every district called Regional Shared Services Centres (RSSC).

According to the departmental Annual Report 2020/2021, the following three entities form part of the departmental organisational structure and report directly to the Director General (DG): the Deeds Registration Trading Entity with eleven (11) Deeds Registration Regional Offices, the Surveyor General Office with six (6) Provincial Surveyor General Offices and the Commission on Restitution of Land Rights Office with nine (9) Chief Land Restitution Office in every province (Dalrrd, 2021).

The following entities are not part of the departmental organisational structure but report directly to the ministry: the Agricultural Research Council (ARC); the National Agricultural Marketing Council (NAMAC); Onderspoort Biological Products (OBP); the Perishable Products Export Control Board (PPECB); the KwaZulu-Natal Ingonyama Trust Board (ITB) and the Office of the Valuer – General (OVG) (Dalrrd, 2021).

This clearly shows that the subject of the study is an organisation within the public sector. The outcomes of the study have a potential to impact positively on South African public service endeavours to improve efficiency and to modernise the public sector.

As an organisation within the public sector, the DALRRD mandate includes developing agricultural value chains, providing agricultural inputs and monitoring production and consumption in the agricultural sector, the establishment of framework for the implementation of land reform as well as facilitating comprehensive rural development (Department of Agriculture, Land Reform and Rural Development, 2023). The mandate finds expression in Chapter 6 of the National Development Plan 2030, which envisioned an integrated and inclusive economy that involves the expansion of agricultural activity, the need for effective land reform and the promotion of sustainable rural development (South Africa National Planning Commission., 2012). The work of DALRRD is directly aligned to priority two of economic transformation and job creation (RSA, 2019).

The NDP set a national agenda for the public organisations in partnership with private sector to improve the quality of life of South Africans. In an effort to achieve the objectives of National Development Plan (NDP) by 2030, the South African Government and businesses adopted the Integrated ICT Policy Framework in 2016. The Framework is characterised by three pillars: (i) Digital transformation of government (ii) digital access and (iii) digital inclusion to guide the digital transformation agenda (National Integrated ICT Policy White Paper, 2016).

Governments are adopting policies aimed at leveraging the benefits of digital, smart and connected societies as part of their development agenda: (Manda and Backhouse, 2017). Managing public service processes and accessing government services are made easier by a digitally transformed government for the convenience of citizens that in turn builds upon the social compact (SITA, 2019).

However, the journey of digital transformation must be driven by the leaders of the organisation. Leaders must internalise the need to transform and assume the

role of being agents of changes. Leaders help shape the personality and values of the organisation: (Armstrong and Lee, 2021). According to Westerman, Bonnet and McAfee (2014) senior leaders should provide the right environment and guidance for digital transformation. The failure rate of public sector transformation efforts is higher, at 80%, compared to that of the private sector at 74% and in both sectors, people practices are the decisive factors (Checinski, Dillion, Hieronimus and Klier., 2019). Leadership's perception of their role is critical towards realisation of digital transformation in every organisation. Perception is the way the brain interprets sensations to make them meaningful: (Papalia and Olds, 1988).

1.3 Research problem

Leaders help shape the personality and values of the organisation: (Armstrong and Lee, 2021). According to Hai, Van and Tuyet (2021) leaders should foster a sense of urgency to make changes of transformation within the unit. Kavanagh and Ashkanasy (2006) argues that leadership is essentially a process of social influence in which individuals want to feel included, supported and reinforced, especially during change.

The purpose of this study was to gain insight in how senior managers understand the relevance and impact of digital transformation and how they perceive their role in facilitating it in the public sector.

1.4 Research questions

In order to achieve the study objectives, the following four (4) research questions were investigated:

1. What are senior managers' understanding of digital transformation within the context of their work environment?

2. How do senior managers perceive the role of leadership in the digital transformation journey?

3. What is senior managers' perception of innovation in the digital transformation journey?

4. How do senior managers describe the organisation's current digital maturity status?

1.5 Rationale

South Africa is struggling with the creation of one public service that is able to attract critical skills to drive the transformation agenda. Additionally, the literature on public sector digital transformation remains limited vis-à-vis private sector.

The study contributes to the body of knowledge relating to senior managers' role in facilitating digital transformation in the public sector within the South African context. The study also adds to the discussion of modernisation and professionalisation of the public service. Finally, the research provides ideas about current thinking and potential initiatives/interventions to enable leaders to guide the digital transformation process.

1.6 Delimitations of the study

The research topic focus was on Senior Management Members (SMS) of the department from Director (Salary Level – 13) to Director General (Salary Level - 16). The study was restricted to the senior management level.

The study focussed on the perception of senior management's role in digital transformation and their perception of leadership and innovation in the digital transformation journey, excluding the actual assessment of Digital Maturity.

1.7 Definition of terms

Term	Definition
Senior Management Member	For the purpose of the study, Senior Management Member refers to Director – Salary Level 13, Chief Director – Salary Level 14, Deputy Director General – Salary Level 15 and Director General – Salary Level 16).
Senior Management Services	Senior Management Services is from Director-to-Director General.
Department	Department of Agriculture, Land Reform and Rural Development or DALRRD and all entities reporting to Director General (Registration of Deeds Trading Account, Commission on Restitution of Land Rights and Surveyor General Office).

1.8 Assumptions

The researcher assumed that Senior Managers' limited understanding of concepts like digitisation, digitalisation and digital transformation had a potential to influence the research outcome. The assumption is prompted by widespread belief amongst scholars and practitioners of digital transformation that public service lags behind the private sector in leveraging available technology to improve internal efficiency and meet customers' needs (Checinski et al., 2019).

The second assumption is that the bureaucratic nature of public service and risk averse organisational culture, which are mostly anchored by the senior managers, can have an impact on the outcome of the research. The third assumption is that the politically intense public service atmosphere can put undue pressure on senior managers to sound politically correct during the interviews,

though they would be given assurance that all responses would be anonymised. Finally, the limited literature on public sector digital transformation was a risk to the outcomes of the research.

1.9 Chapter outline

The research report is organised into the following six (6) chapters:

Chapter 1: Introduction

This chapter presents the purpose and background of the study, the research problem, the research questions, the rationale, delimitations of the study, definitions of terms and assumptions.

Chapter 2: Literature review and theoretical framework

This chapter provides a literature review on various aspects relating to Senior Management or leadership perceived roles in facilitating digital transformation in the public sector. By means of a literature review, the researcher attempts to respond to some of the research questions above. The chapter also focusses on different definitions of digital transformation, leadership and leadership role, digitalisation, digitisation and innovation.

Chapter 3: Research methodology

This chapter outlines qualitative research method used for the study. The semi – structured interviews used for data collection, the population from which sampling was done, participants details and analysis.

Chapter 4: Presentation of findings

The chapter present findings based on the data collected through the interviews in relation to the four (4) research questions. The chapter also outline participants demographic profile (e.g. age and gender distribution etc.).

Chapter 5: Discussion of findings

This chapter discusses and interprets the findings presented in chapter 4 and link them with the literature. The findings are also linked with the primary purpose of the study through the answers to the four (4) research questions investigated in the study.

Chapter 6: Conclusion and recommendations

This chapter includes a consolidation of the findings presented in the previous chapters to answer to the four (4) research questions. It starts with the conclusion per research question, recommendations and possible future research/study emanating from the findings.

CHAPTER2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

The disruptive changes brought by the fourth industrial revolution are redefining how public institutions and organisations operate: (Schwab, 2016).

This section reviews the literature and examines the meaning of key concepts, namely digital transformation, innovation and leadership and how they relate to the digital transformation journey of organisations, in particular public sector institutions.

2.2 Definition of topic or background discussion

In this section, the different concepts/topics are presented from digital transformation, digital maturity, digitisation to innovation and leadership.

Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how it operates and delivers value to the customer (Isabirye, Raju, Kitutu, Yemeline, Deckers, and Poesen (2012). According to Armstrong and Lee (2021), digital transformation is the sum total of all organisational change efforts in response to technological disruption. The authors argue that digital transformation results in a marked change in form and nature for improved organisation.

Digital maturity is defined as a measure of an organisation's ability to achieve desired strategic and operational organisational outcomes in the presence of, and embracing, profound technological change (Armstrong and Lee, 2021. P. 520).

Digitisation is the conversion of data or information from analogue to digital or binary (Armstrong and Lee, 2021; CDDG, 2021). Digitalisation is opening effective online interaction (CDDG, 2021). Digitalisation further to the bigger set

of all transformations and changes that are required to make the digitisation process work (Armstrong and Lee, 2021).

Innovation is the process by which new ideas are developed, tested and brought to the market by business (Rogers, 2016). Innovation is about making the existing product function better (Isabirye et al., 2012).

Leadership is the process of influencing people within an organisational context to direct their efforts towards particular goals (Warnich, Carrel, Elbert and Hatfield, 2015).

2.3 Digital transformation

Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to the customer (Isabirye et al., 2012). According to Armstrong and Lee (2021), digital transformation is the sum total of all organisational change efforts in response to technological disruption. They further assert that it results in a marked change in the form and nature of the organisation, especially so that the organisation is improved. Chaffey (2015): refers to digital transformation as digital business transformation and he defines it as significant changes to organisational processes, structures and systems implemented to improve organisational performance through increasing the use of digital media and technology platforms. Stone (2019) argues that digital transformation is the development of a unified platform, consisting of systems and processes exploiting digital technologies in a manner that fundamentally changes how the organisation collects and uses data to positively influence customer interactions. AlAhmari (2022) defines digital transformation as the integration of digital technology into all areas of business, fundamentally changing how you operate and deliver the value to the customer.

The definitions above confirm that digital transformation is applicable to all organisations, including Government and other non-profit organisations. It can also be agreed that digital transformation brings about unprecedented changes to all aspects of business or the organisation’s machinery to improve

organisational performance. However, there is a need to contextualise digital transformation application to the public sector. The section below focusses on this aspect.

2.3.1 Digital transformation in the public sector

Digital transformation in the public sector is a topic that is still in its infancy as there is limited evidence on how governments and public organisations approach digital transformation (Nachit, Jaafari, Fikri and Belhcen, 2021). Digital transformation is an increasingly essential necessity and a strategic imperative for governments around the world due to the growing speed with which disruptive digital technologies are changing every aspect of society and life (Nachit et al., 2021).

According to Mergel, Edelmann and Haug (2019), digital transformation is a comprehensive effort to change core processes and government services to transcend traditional digitisation efforts. They further argue that digital transformation net result is the satisfaction of user needs, new forms of service delivery and expansion of the user base.

The publication of the Council on Digital Government Strategies, Public Governance and Territorial Development Directorate (OECD report, 2014) recommend the shift from e – government to digital government as one of the key digital government strategies towards digital transformation, as depicted in **Figure 2.1** below.

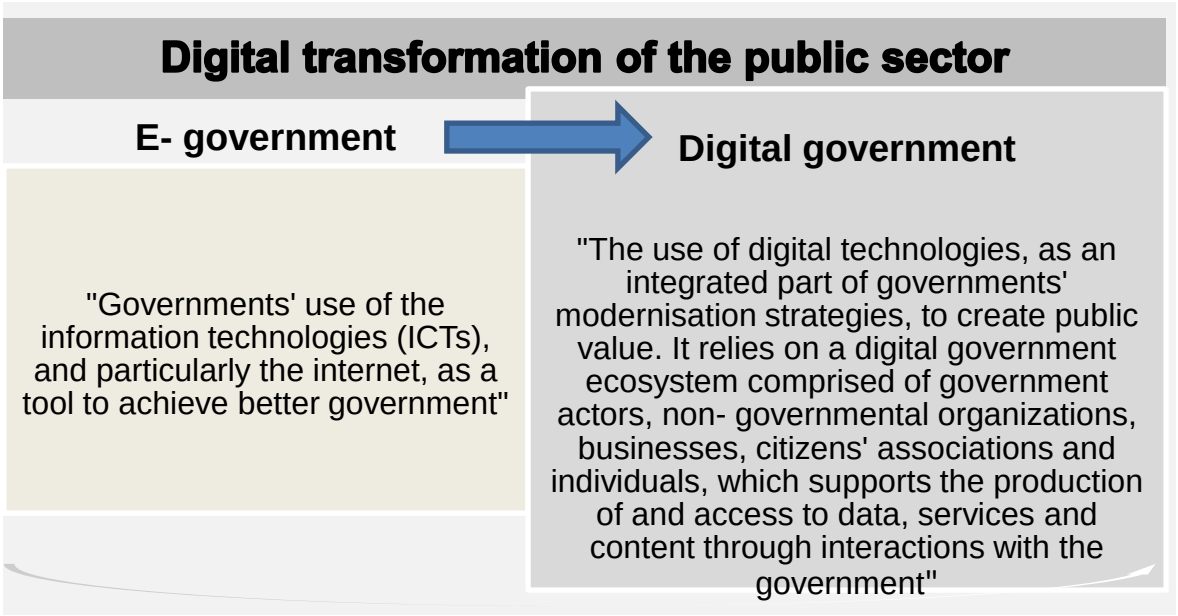


Figure 2. 1: Digital transformation in the public sector: From E – government to Digital government.

Source: Based on OECD (2014), P.6

In an attempt to limit or specify digital transformation in the public sector, other scholars coin the phrase “Digital Government Transformation”. Digital Government Transformation (DGT) is defined as the introduction into government operations of radical changes, alongside more incremental ones, within both internal and external processes and structures, to achieve greater openness and collaboration within and beyond governmental boundaries. DGT is enabled by the introduction of a combination of existing ICTs and/or new data-driven technologies and applications and by a radical reframing of both organisational and cognitive practices. It may encompass various forms of public sector innovation across different phases of the service provision and policy cycles, to achieve key context-specific public values and related objectives including increased efficiency, effectiveness, accountability and transparency, in order to deliver citizen-centric services and policies that increase inclusion and enhance trust in government (Codagnone, Liva, Barcevičius, Misuraca, Klimavičiūtė, Benedetti, Vanini, Vecchi, Gloinson, Stewart, Hoorens and Gunasheka , 2020).

The definition by Codagnone et al. (2020) was adopted by this study. Firstly, the adoption of this definition was influenced by its inclusive and comprehensive nature. It includes “innovation” which is all about changes through co-creation of value for all stakeholders. Secondly, it collapses the silo mentality between Government, business and citizens by establishing a platform to pull resources together. Thirdly, efficiency, effectiveness, accountability, transparency and creation of conducive environment to explore, learn and innovate are all functions of the leader.

The literature points to the importance of these aspects.
Proposition 1: As digital transformation is guided by the institutional strategy and requires leaders to have a contextual understanding of their institutional digital transformation strategy.
Proposition 2: Digital transformation is an enabling of the institutional strategy and requires of leadership to fulfil a leadership role in guiding the process.

2.4 Innovation

Innovation is something that is new (Smith, 2010). According to AlAhmari (2022) innovation is not just doing something new for the sake of it but to add value or solve a problem within an existing system or organisation. Shah, Gao and Mittal (2014) on the other hand argue that innovation results from the application of knowledge which breeds new business opportunities, regardless of whether these are the result of innovations in technology, innovations in process, product, or service or innovations in business models and business processes. Rogers (1983) defines innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption.

According to Rogers (1983) innovation has five characteristics, which he describes as follows:

(1) relative advantage is “the degree to which an innovation is perceived as being better than the idea it supersedes”,

(2) compatibility is “the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters”

(3) complexity is “the degree to which an innovation is perceived as being relatively difficult to understand and use”,

(4) trialability is “the degree to which an innovation may be experimented with on a limited basis” and

(5) observability is “the degree to which the results of an innovation are visible to others”.

Rogers (1983) further argues that innovation that is perceived to have greater relative advantage, compatibility, trialability, observability and less complexity will be adopted more quickly than other innovations.

2.4.1 Innovation in the public sector

Innovation in the public sector refers to significant improvements to public administration and/or service (OECD, 2012). According to the OECD (2012), there are four innovative approaches in service delivery, namely:

- **Digital technologies (web 2.0):** Information and communication technologies (ICTs) enable governments to meet new demands for online services, to tailor services to individual needs through service personalisation and to reduce transaction costs. Governments use ICTs to transform service delivery and engage users in the planning or delivery of services through the use of web 2.0 tools.

- **Partnership with citizens and civil society**: The engagement of individual citizens and civil society organisations as partners in the delivery of public services (co-production) can lead to higher user satisfaction and may reduce costs.

- **Partnership with private sector:** Public Private Partnership (PPP) can reduce the costs of service provision to Government and provide innovative approaches.
- **Solutions to improve access condition:** Focus on bringing the services closer to the user by improving access conditions.

Codagnone et al., (2020) argues that there are four types of innovation in the public sector. These types of innovation are named and defined below **(Table 2.1).**

Type of innovation	Definition
(1) Organisational innovation	Improvement of quality, internal efficiency and external processes through transformation and creation of new organisational structures and routines.
(2) Service and/or policy innovation	Establishment of new services and policies and creative ways to deliver them in a more individualised manner and increased reach.
(3) Governance innovation	The reconfiguration of structures and processes to respond to distinct societal problems through the establishment of multisided platform to interact with all stakeholders, internal and external ones. To build a system that is more collaborative and encourages co-creation of value through knowledge sharing by public-private-people-partnerships. The creative and innovative ways to communicate and promote the organisation and the nature of services it offers.
(4) Conceptual innovation	Development and introduction of new concepts, normative and cognitive routines with regard to internal

	organisational functioning and the environment within which the organisation operate. It helps to redefine the problems and possible solutions, to accelerate new thinking and to transform the behavioural patterns. It helps to change the lens through which policies and services are developed and deployed. The net results are improved identification of citizen's needs and shortened time to develop, test, implement and diffuse a policy; adopting new languages and concepts and new methods to influence behaviour.

Table 2. 1: Types of innovation,

Source: (Codagnone et al. 2020)

2.4.2 Leadership

Leadership is about setting a direction or vision for others to follow (Smith, 2010). According to AlAhmari (2022),leadership is the ability to influence a group towards the achievements of its goals. Burns (2020) defines leadership as concerned with setting direction, communicating and motivating staff. Schein (1988) argues that the actual leader characteristics are shaped by a series of leader perceptions, namely, how the leader perceives subordinates, the task and situation and himself or herself in relation to the subordinates and the task. Ehlers and Lazenby (2011): characterise leaders as individuals who are more experimental, visionary, flexible and creative and who value the intuitive side of their work. A common view among managers in all sectors is that digitisation can only be successful if top management support is ensured (Andersson, Movin and Teigland, 2018).

The above arguments demonstrate that the functions of leaders are the same, irrespective of the nature of organisation or the sector type (i.e. public or private).

2.5 ANALYTICAL FRAMEWORK

2.5.1 Theoretical framework

The study drew on the work of Armstrong and Lee (2021), The Unified Model of Digital Maturity **(see Figure: 2.2)**, for guidance and demonstration of the role of senior managers in the digital transformation journey of the organisation. The detailed description of the model's sub-factors and measures is provided in **Appendix A.**

The model is grouped in two dimensions, Leadership and Strategy and Digital Application and Impact. According to the authors, the grouping is beneficial in two ways: (1) it makes the model easier to grasp and apply in practical settings and (2) it provides for better graphical representation of results. Armstrong and Lee (2021) argues that Leadership and Strategy are the drivers of digital transformation constituted by Vision and Strategy, Organisational Culture, Organisation and Governance, New Value Streams and Business Models, Innovation and Investment and Digital Ethics. The second pillar is Digital Application and Impact which is constituted by Customer Orientation and Engagement, Digital Product Innovation, Workforce Enablement and Performance, Core Process Digitalisation, IT/IS Excellence and Results which are the manifestations of digital transformation.

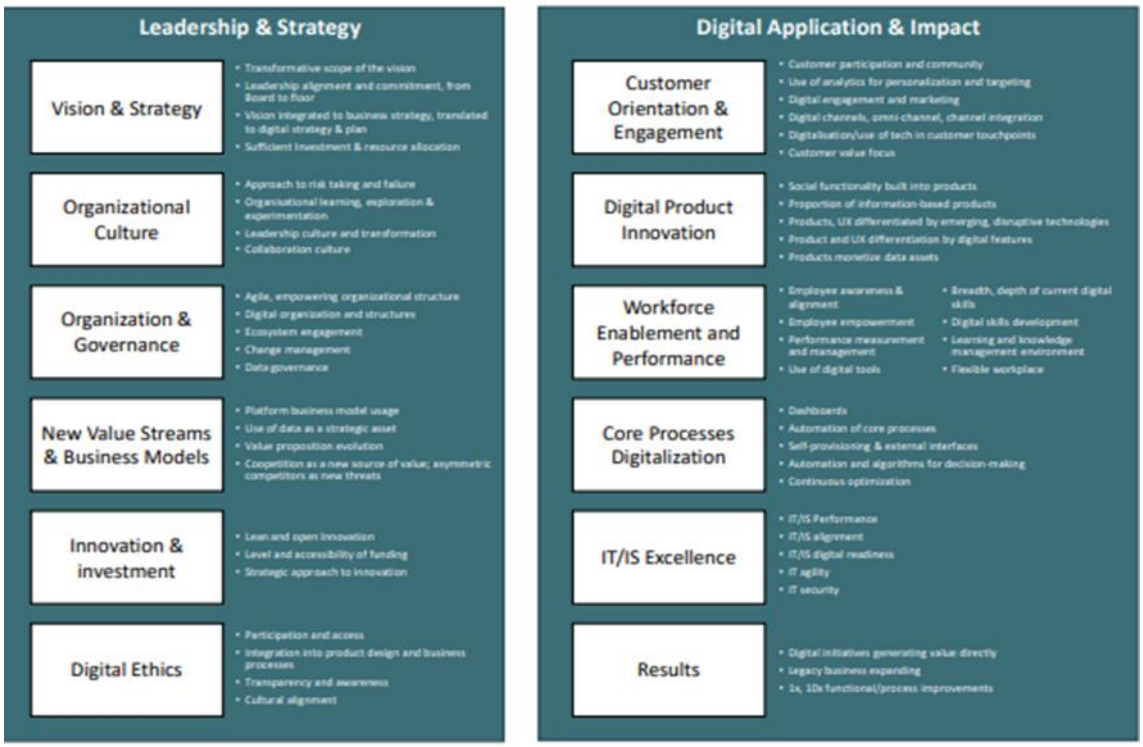


Figure 2. 2: The Unified Model of Digital Maturity

Source: Armstrong and Lee (2021), P.540.

2.5.2 Conceptual framework

The study drew on Teece (2018), Dynamic Capabilities Framework **(see Figure 2.3)**, to assist in the exploration of senior managers' role in facilitating the departmental digital transformation journey. The author argues that the framework helps managers in organising and prioritising competing and conflicting information successfully in their attempt to build a competitive advantage.

According to Teece (2018), the framework has three main interdependent components, namely capabilities, resources and strategy which collectively determine the competitiveness of a firm. Teece (2018) further describes capabilities as the determination of what the firm is able to do and how effectively it can make changes.

Firstly, at the centre of the framework is the capability hierarchy with ordinary capabilities at the base and dynamic capabilities at the top (Teece, 2018). Ordinary capabilities support the production and sale of defined sets of products

and services in the company's current environment while dynamic capabilities enable the firms to identify profitable configurations of competencies and assets, assemble and orchestrate them and then exploit them with an innovative and agile organisation (Schoemaker, Heaton and Teece, 2018). Schoemaker *et al.* (2018) further argue that dynamic capabilities serve as a bridge between the present and future without which the organisation will be disrupted by change. Dynamic capabilities are characterised by three clusters of entrepreneurial activities that concurrently run throughout the organisation: sensing, seizing and transforming (Schoemaker et al. 2018; Teece, 2018).

The key activity for sensing is environmental scanning within which an organisation operates with the intention to detect changes and understand their deeper implications for the survival of the organisation (Schoemaker et al. 2018). The seizing capabilities refers to the agility of the organisation to seize opportunities and respond to threats by successful innovation and implementation of new systems to take advantage of the external changes (Schoemaker et al. 2018). Transforming capabilities is the periodical renewal of the organisation while keeping the elements of the organisational system aligned with each other and the strategy (Schoemaker et al. 2018).

The second component is resources which include employees, equipment, buildings and intangible assets (Teece, 2018). According to Teece (2018), the resources are categorised into two, generic resources which can be replaced and the more important ones are intangible and support lasting competitive advantage. Teece (2018) argues that significant resources possess qualities summarised as VRIN: valuable, rare, imperfectly imitable and non – substitutable.

The third and the last component is strategy which helps to determine the timing of market entry and how to outsmart the competitors (Teece, 2018). Ehlers and Lazenby (2010) have defined strategy as an effort or deliberate action that an organisation implements to outperform its rivals.

The dashed border on Figure 2.3 indicates elements that are external to the firm and arrows major influence (Teece, 2018).

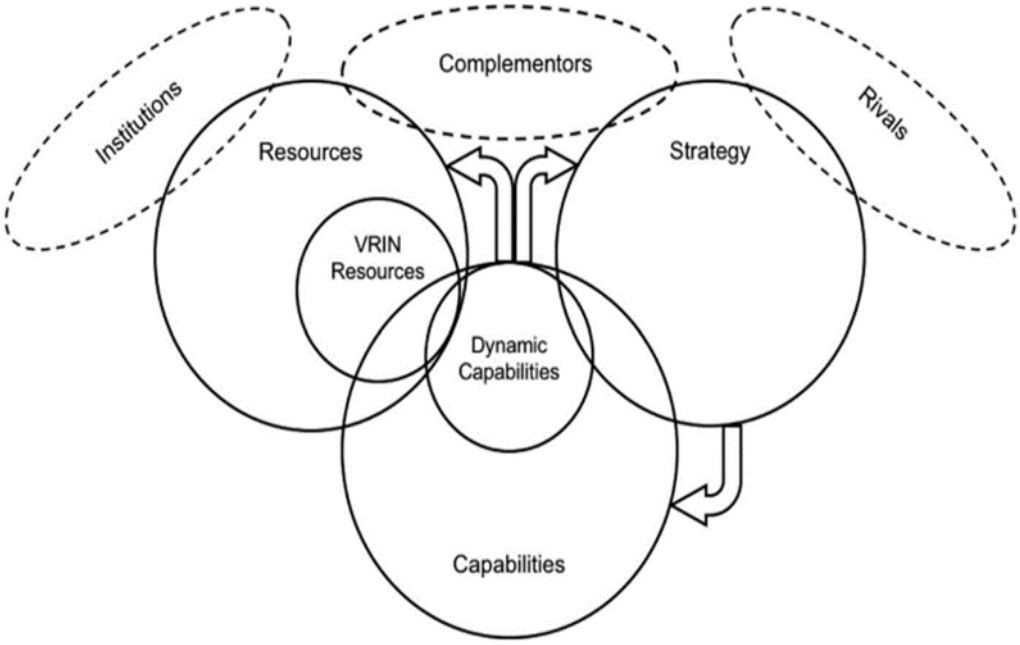


Figure 2. 3: Dynamic Capabilities Framework,

Source: Teece (2018), P. 363

According to Kattel (2022), literature on the dynamic capabilities in the public sector is limited compared to that of private sector. Piening (2013) defined dynamic capabilities in the public sector "as bundles of interrelated routines which, shaped by path dependency, enable an organisation to renew its operational capabilities in pursuit of improved performance" (Piening, 2013: 216, as cited in Kattel, 2022: 12). Kattel and Takala (2021) argue that dynamic capabilities are systemic resources and abilities to interrogate the existing routines and capacities and require periodic renewal and nurturing to remain relevant. According to Kattel and Takala (2021), the public sector dynamic capabilities theory presents a platform for public organisations to act more proactively in tackling challenges.

Mazzucato M., Kattel R., Quaggiotto G. and Begovic M. (2021) made the following four (4) recommendations that governments should implement to create the fertile grounds for dynamic capabilities in response to change:

- Build in-house capabilities and skills focussed on adaptability and learning.

- The democratisation of innovation through creation of a new interface and diffusion platform for continuous engagement by citizens, public and private sector innovators.
- The building of data infrastructures and public digital platforms for the provisioning of both truthful evidence and accurate information to combat disinformation and cybersecurity issues and to also enable equitable access to public services.
- Explore new mechanisms to accelerate cross-cutting learning, for example the creation of peer-to-peer networks for intergovernmental learning.

The literature points to the importance of these aspects.

Proposition 3: Digital transformation and innovation have a symbiotic relationship towards the achievement of institutional strategy and requires leaders to create conducive organisational environment for continuous learning to improve internal efficiency and provide required quality services.

Proposition 4: Digital transformation requires leadership comprehensive assessment and accurate description of organisational readiness to adopt modern/new technology to achieve institutional strategic outcomes.

2.6 Conclusion of the literature review

The Unified Digital Maturity Model and Dynamic Capabilities Framework are guiding frameworks in the management of digital transformation, adoption of innovation and the overarching leadership role in the process. The models synthesise the study's findings to address the four main questions posed in section 1.4 as well as the subsequent propositions:

- A digitally or tech savvy senior manager will be conversant with digital transformation concepts and the need for it.
- An emphatic leader with a compelling vision can mobilise the staff to support the digital transformation journey of the organisation**.**
- A leader who instils a culture of learning in the organisation supports the creation of new value.

- An organisation that leverages modern technology (e.g., IoT, robotics etc.) is characterised by improved performance and customer satisfaction.

CHAPTER 3: RESEARCH METHODOLOGY

This chapter discusses/presents research methodology and procedures which are the backbone of the study. The chapter is outlines as follows:

- Section 3.1: Research approach
- Section 3.2: Research design
- Section 3.3: Data collection method
- Section 3.4: Population and sample
- Section 3.5: The research instruments
- Section 3.6: Procedure for data collection
- Section 3.7: Data analysis and interpretation
- Section 3.8: Limitation of the study
- Section 3.9: Transferability and Dependability
- Section 3.10: Demographic profile of respondents
- Section 3.11: Ethical considerations

3.1 Research approach

A qualitative research approach was used to conduct the study. Creswell and Creswell (2018) describe qualitative research as a process of research involving emerging questions and procedures, collecting data in the participant's setting, analysing the data inductively, building from particular to general themes and making interpretations of the meaning of the data. According to Salkind (2012) a qualitative research studies phenomena within the social and cultural context in which they occur.

According to Leedy and Ormrod (2010), a qualitative research process is more holistic and "emergent", with the specific focus, design, measurement

instruments (e.g. interviews) and interpretations developing and possibly changing along the way.

The qualitative approach was deemed appropriate for this study as the main purpose of the study was to explore or uncover senior managers' perceptions and views of their role in the digital transformation process.

The study used an interpretive approach to comprehend the senior managers' perceptions of their role in facilitating digital transformation in the public sector. The literature review pointed towards a high failure rate in the public sector transformation - as high as 80% in comparison to 74% in the private sector (Checinski et al. 2019). Senior managers have a critical role to play if the department is to succeed. In any successful organisation, leaders drive change through crafting a compelling vision, harness the energy of employees, rally them behind the vision and leverage their skills.

3.2 Research design

A research design is a plan or blueprint of how you intend to conduct the research (Mouton, 2021). Leedy and Ormrod (2010) asserts that a research design provides the overall structure for the procedures the researcher follows, the data the researcher collects and the data analyses the researcher conducts.

According to Caelli, Ray and Mill (2003), generic qualitative research is research which is not guided by an explicit or established set of philosophic assumptions in the form of one of the known qualitative methodologies. The authors further argue that generic qualitative studies exhibit some or all of the characteristics of qualitative studies by either combining several methodologies or claiming no methodological viewpoint at all. The general focus of a generic qualitative research study is on understanding an experience or an event (Caelli et al. 2003).

The approach followed for the study was generic interpretative qualitative design. It was deemed to be the best suited because it assisted in exploring how senior managers think about and perceive their roles in facilitating digital transformation within their particular institutional contexts. It was aimed at exploring what they

consider barriers and triggers towards successful implementation of transformation, creation of conducive environment for corporate entrepreneurs and leadership requirements.

This enabled the researcher to obtain rich information about managers' experiences, leading towards insights into the life-world realities of these managers in terms of potential challenges, opportunities, difficulties and/or fears they experience in terms of the digital transformation of their institution.

The four (4) questions outlined above in section 1.4., helped the researcher to generate a deep understanding of participants' experience and thinking. The questions are semi-structured with the intention to facilitate free flowing discussions with the participants.

3.3 Data collection methods

Data may be gathered by a variety of data collection methods (Mouton, 2001). In a qualitative study, data can be gathered through multiple forms like interviews, observations, documents and audio-visual information (Creswell and Creswell, 2018; Leedy and Ormrod, 2010). Leedy and Ormrod (2010) have asserted that qualitative researchers tend to select few participants who can best shed light on the phenomena under investigation. Creswell and Creswell (2018) state that in a qualitative study, the researcher seeks to establish the meaning of a phenomenon from the views of the participants.

This study used individual semi-structured interviews to collect the data. Semi-structured interviews are flexible and enables the researcher to respond to the direction in which interviewees take the interview: (Bryman, 2012). The method allows the participants to express themselves and the interviewer gains valuable information about their personal experience. The collected data for this study assisted in addressing four (4) main questions (1) What is senior managers' understanding of digital transformation within the context of their work environment? (2) How do senior managers perceive the role of leadership in the digital transformation journey? (3) What are senior managers' perceptions of

innovation in the digital transformation journey? And (4) How do senior managers describe the organisation's current digital maturity status?

Interviews in a qualitative study are either open ended or semi - structured (Leedy and Ormrod (2010). In a qualitative study, interviews can be face-to-face with participants, via telephone or group interviews with six to eight interviewees in a group (Creswell and Creswell, 2018). Bryman (2012) further pinpoints that, a qualitative study is much interested in the interviewee's point of view.

For this study, the aim was to conduct the interviews in a face – to – face setting. However, in situation where face – to – face was impossible, video calls (via Zoom or MS Teams) would be used. In all instances, the interviews would be recorded i.e., audio or video recorded with the consent of the research participants.

One of the limitations of interviews is that some people are not articulative and perceptive (Creswell and Creswell, 2018). The disadvantage of semi-structured interviews is that it may take longer than the scheduled time.

3.4 Population and sample

The purpose of the study was to gain in-depth knowledge from decision makers on their perceived roles in facilitating digital transformation within their departments.

The following sub-sections briefly define a target population, sample and sampling method.

3.4.1 Population

Bryman (2012) defines population as the universe of units from which a sample is to be selected. The population for this study was the senior to executive management level of the Department of Agriculture, Land Reform and Rural Development. This population was located in nine (9) provincial shared services offices, the Deeds Registration Trading Entity with eleven (11) Deeds Registration Regional Offices, the Surveyor General Office with six (6) Provincial Surveyor General Offices and the Commission on Restitution of Land Rights

Office with nine (9) Chief Land Restitution Office in every province and the national office of the Department of Agriculture, Land Reform and Rural Development. According to the departmental annual report of 2020/2021, the total population at the time of publication was 386 (Dalrrd, 2021).

The identified population assisted the study to gain in-depth knowledge on the understanding of senior managers in digital transformation, leadership, innovation and their perceived roles in successful implementation.

3.4.2 Sample

According to Bryman (2012), sample is the segment of the population that is selected for research. The sample is a representative portion of a population (Salkind, 2012). The sample for this study was drawn from the population of Senior Management Members within the Department of Agriculture, Land Reform and Rural Development characterised by Directors, Chief Directors, Deputy Director Generals and Director General.

Approval to conduct the research within the department was granted by DALRRD and an Ethics Clearance Certificate was issued by the University Ethics Committee. The letters of request to conduct interviews or invitation letters to members of the identified population were sent to individuals for consent. Those in agreement completed and signed the consent form. The number of participants interviewed was 15.

3.4.3 Sampling method

There are two main categories of sample design, namely probability sampling and nonprobability sampling (Leedy and Ormrod, 2010). Salkind (2012) argues that nonprobability sampling is when the likelihood of selecting any one member of the population is unknown. Non-probability sampling has three (3) techniques which are convenient sampling, quota sampling and purposive sampling (Leedy and Ormrod, 2010). For the purpose of this study, non-probability sampling was applied, with the specific application of purposive sampling. Purposive sampling

is described as the selection of units (e.g., people, organisations, documents etc.) with direct reference to the prepared set of questions (Bryman, 2012).

The study used purposive sampling because it was aimed at interviewing particular individuals, namely senior managers, who have the relevant technical expertise, knowledge and lived experience to share and uncover senior managers' perceptions of their roles in facilitating digital transformation in the Department of Agriculture, Land Reform and Rural Development. It is only these targeted senior managers who could shed light on the experiences of this management category. The size of a sample depends on the chosen qualitative design (Bryman, 2012; Creswell and Creswell, 2018). The sample size is also determined by the point where the researcher reach a saturation of themes. This means to continue with the interviews until the researcher do not hear or receive anything new or new relevant data from the respondents (Bryman, 2012; Creswell and Creswell, 2018). The expected number of interviews was 10 – 15.

3.5 The research instruments

According to Salkind (2012), an interview is a method of collecting data that is similar to an oral questionnaire and it can be informal and flexible or structured and focussed.

A list of questions to gain in-depth knowledge on the phenomenon was preprepared. Merriam (2009): argues that an interview guide or schedule is a list of questions a researcher intends to ask. According to the author, the benefit of the interview schedule is to allow the researcher to gain much needed experience and confidence to conduct more open-ended questions during interviews. In testing the relevance of the questions' sequence, pilot interviews are conducted (Merriam, 2009).

This study made use of an interview schedule that was structured following three research themes arising from the literature review: (1) Digital transformation; (2) Innovation and (3) Leadership. The interview guide for the targeted participants can be found in **Appendix F**.

3.6 Procedure for data collection

Both the Department of Agriculture, Land Reform and Rural Development and the University issued permission letters and ethics clearance certificates respectively to conduct interviews with senior managers of the department. The information letters were sent via email to the targeted participants providing background on the research study **(Appendix B)**. The participants who agreed to take part, completed and signed consent forms and interviews were scheduled based on their availability and preferred location. The procedure that was followed is outlined below:

(1) The interviews sessions were scheduled with the participants depending on their availability, preferred location and use of pseudonyms to protect participants.
(2) Copies of covering letters were sent to the participants explaining what the research was about, their rights were and what would be done with the data collected from them. These letters were read again before the start of the interview.
(3) Participants were reminded that their comments and identity would be kept confidential.
(4) The interviews were audio and video recorded depending on the nature of the session, e.g., face – to – face, via telephone (audio recorded) and virtual sessions (video recorded). The recordings are kept safe and confidential.
(5) The format of the sessions was either face-to-face or virtual interviews.
(6) Microsoft Teams was used for virtual sessions.
(7) The outcomes of the research would be communicated to them through the research “abstract”.

3.7 Data analysis strategies and interpretation

According to Mouton (2001), analysis is “breaking up” the data into manageable themes, patterns, trends and relations. Data analysis involves segmenting and taking apart the data as well as putting it back (Creswell and Creswell, 2018).

Interpretation is a synthesis of data into larger coherent wholes (Mouton, 2001). Interpretation involves several procedures like summarising overall findings, comparing the findings to the literature, discussing a personal view of the findings, stating limitations and future research (Creswell and Creswell, 2018).

This study used a thematic analysis approach. Bryman (2012) describes thematic analysis as the analysis of qualitative data to refer to the extraction of key themes in one's data. The study adopted five (5) sequential steps of data analysis as proposed by Creswell and Creswell (2018) :

- Step 1. Organise and prepare the data for analysis
- Step 2. Read or look at all the data
- Step 3. Start coding all of the data
- Step 4. Generate description and themes
- Step 5. Representing the description and themes

Creswell and Creswell (2018) argue that the thematic approach and software programs like Atlas.ti allow the study to develop a comprehensive understanding of the topic from the individual responses of the participants, deepen the analysis of data and add to the theory building of digital transformation in the public sector.

3.7.1 Data analysis procedure

The process followed for data analysis in the study is described below:

1. The recordings of all 15 interviews were transcribed into text and notes taken during interviews were integrated and linked to each interview transcript.
2. The transcribed text was cleaned of unrelated data such as pauses, mispronunciations or "winnowing the data" as argued by Creswell and Creswell (2018:192). Table 3.1 provides detailed information on the sequence of participants' interviews, dates and duration.
3. The transcripts were then analysed and coded through Atlas.ti software. According to Creswell and Creswell (2018), the software programs,

amongst others, can facilitate the different codes and help the researcher to organise, sort and search for information in the text.

Participant	**Date & time of interview**	**Duration**
FP	March 04, 2023 17H04	51 minutes
AM	March 06, 2023 14H28	1hour, 1 minute
HM	March 15, 2023 11H54	1 hour, 21 minutes
BB	March 15, 2023 15H11	1 hour, 11 minutes
KD	March 27, 2023 11H22	1 hour, 23 minutes
ST	April 05, 2023 19H27	54 minutes
KR	April 17, 2023 09H46	44 minutes
UP	April 24, 2023 12H47	2 hours, 19 minutes
MO	April 26, 2023 20H23	43 minutes
RK	April 28, 2023 15H41	1 hour, 36 minutes
SC	May 09, 2023 13H55	58 minutes
ZL	May 10, 2023 13H14	1 hour, 8 minutes
QQ	May 11, 2023 19H48	52 minutes
TJ	May 14, 2023 14H54	52 minutes

PO	May 16, 2023 19H30	1 hour, 12 minutes
Total minutes		**1 025 minutes**

Table 3. 1: Face-to-face and virtual interviews study participants

The following six participants were engaged in face-to-face interviews: AM, HM, BB, KD, ST and UP. The other participants were on the MS Teams platform.

3.8 Possible limitations and challenges of the study

The possible limitations and challenges of the study are:

- Inability to generalise the results as it is not a representative sample.
- Findings would potentially be limited or relevant to the management category because the target audience was only senior managers.
- The study was limited to a government department.

3.9 Quality assurance

3.9.1 Transferability

Transferability is concerned with the extent to which the findings of one study can be applied to other situations (Merriam, 2009). This study used rich, thick descriptions, a clarification of potential biases of the researcher and triangulation to convey the findings. According to Creswell and Creswell (2018), descriptions may transport readers to the setting and give the discussion an element of shared experiences.

3.9.2 Credibility

Credibility deals with how research findings match reality (Merriam, 2009). The study adopted both respondent validation and triangulation to confirm if the study have correctly captured or understood the phenomenon under study.

Creswell and Creswell (2018) describe triangulate as different data sources by examining evidence from the sources and using it to build a coherent justification for themes e.g., providing transcripts of interviewees to validate or share themes input or validation. Bryman (2012) describes respondent validation (or member validation) as a process whereby a researcher provides the people on whom he or she has conducted research with an account of his or her findings.

3.9.3 Dependability

Dependability refers to the extent to which research findings can be replicated (Merriam, 2009). This study captured all the steps in the process, clearly and in detail to facilitate replication.

The objective was to ensure that the findings are consistent with the data collected. According to Bryman (2012), an auditing approach entails ensuring all the records are kept free from problem formulation and selection of research participants, fieldwork notes, interview transcripts, data analysis decisions etc. and are accessible in case of peer review.

3.10 Ethical considerations

According to Leedy and Ormrod (2010), there are four categories of ethical issues in research, namely (1) protection from harm, (2) informed consent, (3) right to privacy and (4) honesty with professional colleagues.

This study adopted all the four ethical categories. This implies that, at no stage of the study, were the participants exposed to any psychological or physical harm. In case the participant felt uncomfortable with the line of questions or discussion during interviews, they were informed of their rights to withdraw their participation.

Prior to any engagement or interview with participants, written requests addressed to their organisation as well as to themselves were made. The request letter detailed the topic, purpose of the study, rights of individuals or participants and how the study would unfold. Both the organisation and participants confirmed their participation in writing. No consent letter, no participation **(Appendix C)**.

Participants were informed of their right to privacy. This means, except for the researcher, no one will know the identity of participants and the nature of data they provided in assisting the study. It means confidentiality must be complied with at all costs.

Honesty with the professional colleagues implies that the researcher did not outsource the research to a third party to do it on their behalf. The work and the findings produced must solely be the efforts of the person officially entrusted to conduct research. The researcher complied with the ethical provisions by acknowledging the work of others in conducting the study. No plagiarism was entertained.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the findings from the data collection procedure as detailed in Chapter 3. These findings are presented and described under the four Research Questions (RQ) as they appear in Chapter 1 of the study:

- **RQ 1:** What are senior managers' understanding of digital transformation within the context of their work environment?
- **RQ 2:** How do senior managers perceive the role of leadership in the digital transformation journey?
- **RQ 3:** What is senior managers' perception of innovation in the digital transformation journey?
- **RQ 4:** How do senior managers describe the organisation's current digital maturity status?

The findings are analysed and synthesised using thematic analysis. Data is presented through quotes that are interpreted individually or jointly to support the themes that emerged during the interviews. This chapter is split into the following four sections:

- Section 4.2: Demographic Profiles
- Section 4.3: Emerging Themes
- Section 4.3.1: Findings for RQ 1
- Section 4.3.2: Findings for RQ 2
- Section 4.3.3: Findings for RQ 3
- Section 4.3.4 Findings for RQ 4
- Section 4.4: Conclusion

4.2 Demographic profiles

This section presents the demographic profiles of the 15 participants (see Table 4.1 below). In compliance with the ethics requirements of confidentiality and anonymity, the participants were assigned letters as unique identifiers.

Participants	**Age distribution**	**Gender distribution**	**Qualifications**	**Work experience in years**
FP	51 - 55	Male	Master's degree	35
AM	56 - 60	Male	Master's degree	27
HM	40 - 45	Male	Honours degree	7
BB	40 - 45	Male	Post Graduate Diploma	15
KD	40 - 45	Female	Master's degree	18
ST	40 - 45	Male	Master's degree	21
KR	40 - 45	Female	Master's degree	7
UP	51 - 55	Male	Master's degree	14
MO	51 - 55	Male	Master's degree	10
RK	46 - 50	Male	Master's degree	23
SC	46 - 50	Male	Bachelor's degree	13
ZL	46 - 50	Female	Honours degree	23
QQ	46 - 50	Male	B. Tech degree	13

Participants	Age distribution	Gender distribution	Qualifications	Work experience in years
TJ	51 - 55	Female	Post Graduate Diploma	11
PO	51 - 55	Male	Master's degree	24

Table 4. 1: Participants demographic profile

4.2.1 Participants age distribution

Table 4.1 above shows that, from the total number of 15 participants, five (5) were in the age range of 40 to 45, four (4) were in the age range of 46 to 50, five (5) were between 51 and 55 and one (1) participant was aged between 56 and 60. The observation in the participants' age distribution is that the age bracket of 56 to 60 stands out as an outlier, represented by only one participant.

4.2.2 Participants gender distribution

The gender distribution of the 15 participants as per Table 4.1 above indicates that four (4) were female and eleven (11) were male. This distribution aligns with the gender distribution within the Department of Agriculture, Land Reform and Rural Development. According to the department's 2020/2021 annual report, the total number of Senior Management Services (SMS) members stood at 386 at the time of publication (Dalrrd, 2021). The report further indicates that 230 of the SMS members were male and 156 females.

4.2.3 Participants qualifications

The participants had relatively high qualifications with most of them having university degrees from various disciplines: Geography, Geographic Information Science, Business Administration, Business Analysis, Accounting, Public Administration, Taxation, Environmental Management, Sustainable Agriculture,

Spatial Planning, Town and Regional Planning, Program Management, Property Law and Project Management, among other academic disciplines.

4.2.4 Participants work experience

Finally, the work experience of the 15 participants is illustrated in the demographics section of Table 4.1. We observe elevated levels of work experience among the participants, ranging from 7 to 35 years, showcasing remarkably high level of expertise. This wealth of experience is evident in the quality of responses provided by the interviewees.

4.3 Emerging themes

This qualitative study explored Senior Managers' perceptions of their role in facilitating digital transformation in the public sector in South Africa. To explore these perceptions, four research questions were developed from which sub questions were formulated in order to achieve the purpose. The findings were derived from themes that emerged from each sub question, subsequently linked to the four research questions initially introduced in Chapter 1.

4.3.1 What are senior managers understanding of digital transformation within the context of their work environment? (RQ 1)

This question was important to the study as it would establish how senior managers understand digital transformation within their space. To explore their understanding, seven (7) sub questions were developed and posed to participants which resulted in 15 themes combined. Each sub question and relevant themes are presented and described augmented by relevant quotes from the participants.

Table 4.2 below shows research question 1, sub questions and emerging themes.

RQ1: What are the senior managers understanding of digital transformation within the context of their work environment?	
Sub question: 1.1 What do you understand the study to be all about?	▪ Adopt digitalisation ▪ Move from manual to digital
Sub question: 1.2 What is your understanding or perception of the impact of technological developments on the agricultural sector?	▪ Reduction in animal theft ▪ Improved productivity ▪ Efficiency
Sub question: 1.3 What is your understanding of digital transformation?	▪ Modernise business
Sub question: 1.4 Armstrong and Lee (2021) defined digital transformation as “the sum total of all organisational change efforts … to thrive in the digital age is improved”. Any comments?	▪ Change
Sub question: 1.5 What do you think is senior managers understanding of digital transformation within the context of their work environment?	▪ No uniformity ▪ Lack of digital platforms knowledge ▪ Intergenerational differences

Sub question: 1.6 Do you think that there is alignment in senior managers understanding of digital transformation?	▪ Misalignment ▪ Fear of technology
Sub question: 1.7 Research (Checinski et al., 2019) indicates that public sector transformation efforts failure rate is higher at 80% compared to private sector at 74%. What do you think could be the reasons for public sector high failure rate?	▪ Lack of Consequence management ▪ Bureaucracy ▪ Lack of capacity

Table 4. 2: Research question 1, sub questions and themes

- ***Sub question 1.1: What do you understand the study to be all about?***

According to the participants, the study arrived at an opportune moment, coinciding with technology's pivotal role in all advancements. They strongly advocated for the Government or the Department of Agriculture, Land Reform and Rural Development to adopt technology, aligning with other organisations, aiming to improve effectiveness, efficiency and service delivery. The participants used the terms digitalisation, digitising, digital, electronically, fourth industrial revolution and technology interchangeably. Their understanding was shaped by their respective branches or directorates within the same department.

Participant HM explained the understanding in a way that gave a sense of how everyone had been affected and what leaders should do:

> *"For me, it's about the digital world and how then do we transition or do we make it possible for the department to move into that space. Where we are now, everything is going towards digitalisation and as a department we cannot be left behind when it comes to this. As Senior Managers or leaders*

we also need to foster the discussions around digital integration or everything that is going to do with technology"

Participants TJ and RK emphasised that digital transformation revolves around enhancing Government's effectiveness and efficiency in service delivery by transitioning from manual to digital methods of conducting business.

> ***"****I am a good fan of technology because of the efficiency and effectiveness that it has on the functioning of any organisation. When it comes to the public sector you are aware of the red tapes and inefficiencies. Therefore, I understand the study to be all about how do we bring effectiveness and efficiency in government through technology or digital transformation to improve service delivery" TJ.*

The findings presented and described under this section show that all 15 participants had a clear understanding of the study. It seems that the participants' understanding was influenced by the respective branches within which they operate.

- ***Sub question 1.2: What is your understanding or perception of the impact of technological developments on the agricultural sector?***

The participants were unanimous on the positive impact of technological development in reducing animal theft and improving productivity and efficiency. They highlighted that transitioning to a paperless system would improve efficiency, effectiveness and service delivery. They emphasised the role of senior managers in adopting new and modern technology. It is noted again that their perceptions and explanations of the impact were filtered through the perspectives of their respective branches within the same department. Participant UP summarised the improved productivity and efficiency as follows:

> *"If we look at commercial farmers and what they've termed precision agriculture, that become a thing. Basically, what it says is that you need to have the technological ability to analyse your farming practice on ultra-high scale, in other words, centimetre accuracy. With the technology now, you can take the field and you can literally subdivide it into 1 by 1-meter*

blocks and have an understanding of what's going on in that grid. We can fly the drone to sort of when you plant you can look at the soil through multispectral images, you can see mineral content, you can see water logging, you can see contour problems etc.".

The participants also expressed deep appreciation for the impact made by technological developments in fighting crime in the agricultural sector.

"We live in a country prone to crime so we can even use technology to monitor your crops, your animals through tracking and those things" MO.

The respondents indicated that the impact of technological advancement in the agricultural sector is huge. To do precision agriculture and smart farming, the agricultural sector needs to leverage technology through data mining and analyses thereof. The challenges relating to stock and crop theft are mitigated by the adoption of technology.

- ***Sub question 1.3: What is your understanding of digital transformation?***

The participants share a unified perspective regarding their understanding of digital transformation. Their understanding of the study in sub question 1 above aligns closely with their understanding of digital transformation (DX). Phrases such as moving away from analogue and terms such as manual, informal, traditional, red tape and conventional were used with the meaning of moving from paper to a paperless system or digital space. It is all about modernising business through technology. Also, the words digitalisation, digitising, technology and DX were used interchangeably to mean the same thing. Participant BB confirmed the transition from paper to a paperless system as follows:

"I consider it as a process of transforming digitally from the manual process into a digital space" BB.

Participant KD touched on improved internal efficiencies, strengthening of relations with stakeholders and responsiveness by stating:

“It's all about innovation. It's all about improving on how we do business, time management, effective communication, improving customer relations, customer care, effective responses to the customers” KD.

In summary, it can be stated that the most collective understanding of digital transformation is the transition from paper based to paperless environments. It should be noted that different words or phrases were used to indicate the same thing. These dynamics are noted for their associated benefits which include reduction in production costs, heightened efficiency and effectiveness, decreased emissions leading to environmental friendliness, mitigated climate change effects and ultimately, improved service delivery. The issue of embracing technology was brought up as part of the understanding of the concept. Finally, the respondents considered modernising business through technology as equivalent to DX.

- ***Sub question 1.4: Armstrong and Lee (2021) defined digital transformation as “the sum total of all organisational change efforts … to thrive in the digital age is improved”. Any comments?***

When asked to comment on the definition of Armstrong and Lee, most of the participants (AM, BB, FP, MH, KD, KR, MO, PO, QQ, SC, TJ and ZL) fully agreed with the definition. Participant BB commented as follows:

“Yes, it is the technological disruption. As I indicated the surveyors used to do the survey manually but today you've got like drones which can be used from the technology, from the what you call instruments that they use to capture the survey into processing that information into the office. Maybe we saw this digital disruption during the height of COVID 19 which changes how we work. We now sign the leaves digitally instead of manually. I'm saying the author is right that these disruptions are coming into as a result of changes, sometimes in the environment that affects also the organisation” BB.

Participants RK and ST expressed reservations on the definition. Participant RK commented on the inclusion of digital disruption in the definition, as quoted below:

“I am not sure of technological disruption part of the definition because my view is that this digital transformation might be coming from a zero point. There might not be any disruption of any technology that has been existing in some other areas. By zero point I mean from a manual point of digitising. Otherwise, I agree with the definition of the authors more specifically on issues of change and or change management” RK.

Thirteen participants fully agreed with the definition by Armstrong and Lee. Reference was made to the Covid-19 period when businesses were forced to adopt digital transformation, resulting in the use of platforms such as MS Teams to convene meetings. Two (2) participants disagreed with certain aspects of Armstrong and Lee's definition of digital transformation, particularly contesting the use of the term “disruption”. Additionally, they argued that the definition lacked comprehensiveness as it overlooked the human development element which is crucial to digital transformation.

- ***Sub question 1.5: What do you think is senior managers understanding of digital transformation within the context of their work environment?***

Participants expressed different opinions regarding this sub question. Almost half of the participants (FP, BB, AM, MO, QQ, PO, and ZL) indicated a lack of a shared or uniform understanding of the concept of digital transformation amongst senior managers. These different understandings stem from various factors such a cultural difference and the focus of their respective branches, age differences, educational backgrounds and a lack of knowledge of digital platforms and devices***.*** Participant FP elaborated as follows:

“My peers or Senior Managers are in different levels. I'm saying we're in different levels because we come from different backgrounds. If I were to talk to the senior managers that deals with the line function specifically, not all of them understand how best we can enhance this technology to help us to achieve what we want to achieve or to reach our objectives for their department. My perception is if you look at us in sitting in one meeting as senior managers where you thought maybe we can be in the same level

of understanding, you will find us arguing whether all field officials should have a 3G and a laptop or not" FP.

It is clear from the findings above that there is myriad of factors that contribute to different understandings of what digital transformation is about. There is also an issue related to how digital transformation was introduced into the Department. Some respondents felt that it was forced down which triggered negative understandings or perceptions. The other reason for negative perceptions towards DX in the department has nothing to do with understanding of senior managers. The DX implementation within the department, according to other participants, was anticipated to limit senior managers' travel, which they believe would yield economic benefit because they claim for every official trip taken. Participant ST put it as follows:

"It basically means according to them is that there's no need for you to travel to collect data, the data is at their fingerprints. It therefore means they are confined in an office in front of a computer and they should analyse data like Senior Managers. They are used to travel to meetings and claim thereafter. The negative perception is triggered in this case by economic benefits generated by claims after travelling" ST.

- ***Sub question 1.6: Do you think that there is alignment in senior managers' understanding of digital transformation?***

All the participants (AM, BB, SC, FP, HM, KR, MO, PO, RK, ST, TJ, MO, QQ, ZL and UP) were in consensus that there was no alignment in senior managers' understanding of the digital transformation. Many of the reasons previously outlined in sub question 1.5 were reiterated here as the grounds for misalignment:

"I don't think we are all on the same page as managers, from Directors, Chief Directors, Deputy Director Generals and Director General himself. You can see on the use of computers programs, use of emails, reports systems like RMO and Netefatsa we are not aligned, we are different. Maybe is because of age, educational background or previous experiences" KR.

However, participants MO, QQ and ZL also thought that the Covid 19 pandemic had reduced the misalignment gap, though it still remains.

> *"But I think with COVID - 19, the introduction of things like MS Teams and Zoom, I think people are gradually starting to believe in technology. Instead of talking about digitalisation, to make things better, simple rather say for example, MS Teams is part of a modernisation to make easy for them to follow" MO*

In summary, it seems that the participants were unanimous that there was no alignment. The reasons for misalignment were because of different branches and directorates, lack of consultation, differences in age, educational background and lack of knowledge. It was also pointed out that, in as much as the misalignment gap remains, Covid -19 had played a critical role in reducing the gap. The fear for technology among senior managers and the possible replacement of human beings by technology were also mentioned.

- ***Sub question 1.7: Research (Checinski et al., 2019) indicates that public sector transformation efforts failure rate is higher at 80% compared to private sector at 74%. What do you think could be the reasons for public sector high failure rate?***

Fourteen (14) of the fifteen (15) participants (AM, BB, SC, FP, HM, KR, MO, PO, RK, ST, TJ, MO, ZL and UP) supported Checinski et al., (2019) findings that the failure rate of transformation in the public sector is high. The reasons for this are the lack of consequent management, bureaucracy and lack of capacity:

> *"This service delivery, you may find that it's not actually pushed as hard as the profit which is pursued by the private sector. Lack of consequence management in the public sector because in the private sector they are not shy to fire you" (AM).*

> *"The other group, your bureaucrats. Their function is to create red tape, gives approval or disapprove etc. The bureaucrats will even think up more rules to keep themselves busy while people doing the actual work on the ground cannot work because they are waiting for the approval. The study*

is correct because the public sector is bureaucratic, fixed in approach and not agile" (UP).

"…. the issue of capacity and training. Now, here we have gone past the issue of getting a service provider. We are at the point where the system is there, it must be used. You don't get the proper training in terms of your people who must operate the system. You don't even have in some instances, people to operate the system or use that particular system" (HM).

One participant who disagreed with the findings (QQ) commented as follows:

"I hold a different opinion, although the results are research-based. If you look at institutions like SARS, if you look at DTI, if you look at many other governments sector institutions that have moved and long transformed to digital, you'll realise the efficiency and the speed at which they are able to deliver results. So, the failure rate there, and if you also look at the Department of Home Affairs, they increased the turnaround in distribution of passports, IDs, birth certificates, etc. You'll realise that government has made more bigger strides in digital transformation as opposed to maybe at the time when the study was undertaken" (QQ).

The majority of participants agreed with the statement that the public sector transformation failure rate was higher at 80% compared to the private sector at 74%. They provided various reasons in support of their stance, ranging from lack of consequent management and bureaucratic obstacles to age differences and protocol issues.

4.3.2 How do senior managers perceive the role of leadership in the transformation journey? (RQ 2)

This question was important for the study as it endeavoured to establish how senior managers perceived their role as leadership in the digital transformation journey of the department. To explore their understanding, five (5) sub questions were developed which resulted in eight themes combined. This section presents

and describes each sub question and the themes relevant to each, augmented by the quotes from the participants.

Table 4.3 below shows research question 2, sub questions and emerging themes.

RQ 2: How do senior managers perceive the role of leadership in digital transformation journey?	
Sub question 2.1 What do you think should the role of Senior Manager be in terms of digital transformation journey within the department?	▪ Lead ▪ Change agents
Sub question 2.2 Westerman et al., (2014) argues that senior leaders, need to create the appropriate momentum around digital transformation. Is this what is happening in this department? Please elaborate.	▪ No momentum ▪ Silo approach
Sub question 2.3 How would you describe the role you play in digital transformation of your unit? Please elaborate.	▪ Individual role ▪ Team role
Sub question 2.4 What were the changes or impact that occurred as a result?	▪ Impact
Sub question 2.5 Do you think leadership has a role to play in ensuring alignment between ICT strategy and organisational strategy? Please elaborate	▪ Alignment

Table 4. 3: Research question 2, sub questions and themes.

- ***Sub question 2.1: What do you think should the role of Senior Manager be in terms of digital transformation journey within the department?***

All the participants were of the opinion that senior managers had a role to play in the DX journey of the Department. Participants emphasised the role of senior managers by indicating they should lead and be change agents. Participants QQ and RK put it succinctly as follows:

> *"They must lead, they must collaborate and be visible so that it becomes easier for the other colleagues to take up and follow in their footsteps" QQ*
>
> *"They must be the change agents" RK.*

In summary, the participants agreed that senior managers should occupy the central role in propelling DX otherwise it will not happen.

- ***Sub question 2.2: Westerman et al., (2014) argues that senior leaders, need to create the appropriate momentum around digital transformation. Is this what is happening in this department? Please elaborate.***

All the participants agreed that there was no appropriate momentum created within the department. The department's lack of momentum stemmed from the absence of a unified, shared approach, instead favouring siloed strategies. Participants FP and BB summarised the views of senior managers in the department as follows:

> *"Senior Manager are not creating the momentum in this department referred to by the scholars, there's no sense of urgency" FP.*
>
> *"When you say senior leaders, I will just say "yes" as we are creating a system in our branch but looking at the whole department, I wouldn't say so. It's like the branches are having their own little project that they are doing. A silo approaches. You don't have an overarching approach where you say the whole department. We're working in silos when it comes to digital transformation" BB.*

It is clear that the lack of momentum was because branches and directorates worked independently from each other. The absence of a compelling and

coordinated vision in the DX journey of the Department led to the counterproductive silo approach adopted by many senior managers.

- ***Sub question 2.3: How would you describe the role you played in the digital transformation of your unit? Please elaborate.***

Research participants indicated that they either played a role in their individual capacity (AM, BB, FP, SC, UP and ZL) or as part of the team (KD, QQ and HM) in the DX of their units. The roles played included stakeholders' engagement, capacity building and systems development:

> ***"****I wish you could have actually sent the invite earlier because then you would have seen me inviting all the stakeholders, critical stakeholders, like conveyancers, municipal managers, and various departments that we are serving, bringing them together under one roof to tell them about the digitisation of our office. So how do they fit in? What is expected from them?" AM*
>
> *"I trained officials in ArcGIS software (commercial software) and QGIS software (open-source software). Including integrating that with Google Earth Pro" BB.*
>
> *"I have designed and written the software which was used nationally to implement the project like COVID - 19 Relief" UP.*

Other participants (KR, TJ, PO, RK and ST) confirmed they played no role in the digital transformation of their units. Participant ST is quoted below:

> *"The role that I should be playing myself, which I'm not playing, honestly, we should have GPS devices for the officials when they go out to the field" ST.*

Slightly more than half of the participants played an active role in the DX journey of their units, either individually or as part of the team. The remaining participants were not able to play any meaningful role in the DX journey of their units due to lack of knowledge and understanding and/or because the ICT unit and infrastructure were not experienced as supportive.

- ***Sub question 2.4: What were the changes or impact that occurred as a result?***

According to eight of the participants there was a positive impact resulting from the role they played in the DX journey of their units, individually or as part of the team (AM, BB, SC, UP, ZL, HM, QQ and KD). Participant UP characterised the impact as follows:

> *"The impact was big because it ensured compliance with the COVID 19 protocols, the officials were using their cellphones to take photos and upload on the system which gave us the real time information. Chief among them was the clean audit on the project from the Auditor General" UP.*

The participants, individually or collectively, who were able to put efforts in DX journey of their units, confirmed that the impact was positive. Participants who could not contribute to their units' DX journey had little to discuss regarding their impact, often limited to stating "no impact" in their context.

- ***Sub question 2.5: Do you think leadership has a role to play in ensuring alignment between ICT strategy and organisational strategy? Please elaborate.***

All the participants indicated that leadership had a role to play in ensuring alignment between ICT and Organisational strategy:

> *"Indeed. A very big role to play. I'm saying, if the organisational strategy is talking to developments and innovations within the sector that we are operating in, then the ICT strategy then should be saying in light of these developments in this agricultural space that we're working at, how do we then fit in" ST.*

> *"As Senior Managers, collaboratively we can indeed enforce the alignment because overall, it is our responsibility, what we are paid to do. It is a role we must play" KD.*

"They do. Remember, if we agree we are living in the technological world, the world that has been taken over by technology. Then the organisational strategy will have to fit in into the technological world. Because otherwise you are going to come out with that brilliant organisational strategy which will not be compatible with the technological environment" AM.

All participants unanimously agreed on the pivotal role that leadership should play in aligning ICT strategy and organisational strategy. However, they were not in agreement as to whether ICT strategy must fit into organisational strategy or vice versa.

4.3.3 What is senior managers' perception of innovation in the digital transformation journey? (RQ 3)

This question was important for this study as it endeavoured to establish how senior managers perceive innovation in the digital transformation journey of the organisation. To explore their understanding, three (3) sub questions were developed which resulted in three (3) themes combined. This section presents and describes each sub question and the themes relevant to each, augmented by the quotes from the participants.

Table 4.4 below shows research question 3, sub questions and emerging themes.

RQ 3: What is the senior manager's perception of innovation in the digital transformation journey?	
Sub question 3.1 What is your view on innovation in the public sector (your work) environment?	• Sluggish innovation
Sub question 3.2 What is your understanding of the relevance of innovation in the digital transformation journey of the organisation? Please elaborate.	• Strong connection between innovation and DX

Sub question 3.3 In your view, what improvements or innovations were implemented in this department towards improvement of processes, services delivery for the benefit of all stakeholders (e.g., staff, organisation, citizens etc.)?	• Minimum improvements

Table 4. 4: Research question 3, sub questions and themes.

- ***Sub question 3.1: What is your view on innovation in the public sector (your work) environment?***

All participants agreed with the OECD (2012) view that innovation in the public sector relates to improvement in public administration and/or service delivery. The participants expressed their concern on the sluggishness of innovation within the department due to lack of space and time to innovate. According to participants, if innovation is happening it is not widely communicated for all to support; it is rather confined to the particular branch or directorate. Participants BB, SC and MO drew the following picture on what is happening in the department:

> *"Innovation maybe comes as a result of ideas. And do we have a space of developing those ideas? I think we are more on due dates and submissions" BB.*

> *"My view is that we seem not really providing adequate environment and resources to really get the best out of the teams we are having" SC.*

> *"Innovation is there in the public sector or department, but most of the time it is not communicated widely" MO.*

Some participants felt strongly that innovation should be happening in the public sector or department in accordance with the study by OECD (2012). However, on the practical side of things, it is not happening as a result of the bureaucratic nature of the public sector. Secondly, the public sector does not allow people the

space to be innovative. If it does happen, it is very sluggish and done haphazardly.

- ***Sub question 3.2: What is your understanding of the relevance of innovation in the digital transformation journey of the organisation? Please elaborate.***

All the participants agreed that there is a strong connection between innovation and digital transformation. Participant ZL demonstrated the connection between innovation and digital transformation through the impact of Covid 19 at schools:

> *"There is a connection between innovation and digital transformation. During COVID 19 schools were very innovative by scheduling virtual classes. It means innovation of continued schooling under difficult times was anchored by technology for its realisation. I hope I have answered you Sir" ZL.*

The primary finding suggests that the department's work environment cannot transform digitally without innovation and conversely, there will be constrained innovation without digital transformation.

- ***Sub question 3.3: In your view, what improvements or innovations were implemented in this department towards improvement of processes, services delivery for the benefit of all stakeholders (e.g. staff, organisation, citizens etc.)?***

The majority of the participants indicated that the improvements implemented within the various departments or units were done to benefit all stakeholders. However, they maintained that the impact was minimal in nature and hence the need to do more (RK, PO, BB, AM, KD, SC, TJ, ZL, KR, MO, QQ and UP).

> *"I think attempts are there for the department to do that, but I don't think it is moving at the speed at which it is supposed to be" PO.*

> *"Obviously, on the policies of the department there's quite good thinking that has been done but I still think that there is a lot of innovation that has to be done among staff members" KD.*

Participants HM and ST were adamant that there were no improvements done to benefit all the stakeholders. Participant HM is quoted below:

> *"We are still using an Excel document for a risk register. In short there are no innovations that we can say now benefit the staff, the organisation and the public out there in terms of the improvements" HM.*

All the participants, with the exception of two, argued that there were improvements done by the department to benefit the staff, organisation and citizens, though the impact was minimal. More needs to be done.

4.3.4 How do senior managers describe the organisation's current digital maturity status? (RQ 4)

This question was important for the study as it endeavoured to establish how senior managers describe the organisation's current digital maturity status. To explore their understanding, two (2) sub questions were developed which resulted in six (6) themes combined. This section presents and describes each sub question and the themes relevant to each, augmented by the quotes from the participants.

Table 4.5 below shows research question 4, sub questions and emerging themes.

RQ4: How do senior managers describe the organisation's current digital maturity status?	
Sub question 4. 1 Armstrong and Lee (2021) defined digital maturity as a measure of an organisation's ability to achieve desired strategic and operational organisational outcomes in the	• Weak ICT infrastructure • Lack of capacity • Lack of coordinated compelling vision on DX

presence of, and embracing, profound technological change. On a scale of 1 – 10 (1 - 4 = low, 5 – 7 = Moderate, 8 – 10 = High) how would you judge/evaluate the digital maturity of your work environment? Please explain.	
Sub question 4. 2 What can be done to improve or support leaders to facilitate DX in their departments/units?	• Capacity building. • Resources availability. • Good management approach

Table 4. 5: Research question 4, sub questions and themes

- ***Sub question 4.1: On a scale of 1 – 10 (1 - 4 = low, 5 – 7 = Moderate, 8 – 10 = High) how would you judge/evaluate the digital maturity of your work environment? Please explain.***

Armstrong and Lee (2021) defined digital maturity as a measure of an organisation's ability to achieve the desired strategic and operational organisational outcomes in the presence of, and embracing, profound technological change. The participants were requested to judge/evaluate the digital maturity of their work environment on a scale of 1 – 10, using the definition of Armstrong and Lee (2021). The majority of participants rated their perception from low to moderate, with none providing a rating above moderate level. From the 15 participants, nine (9) rated the digital maturity of their work environment as moderate:

> *"Because it's not like we are starting from afresh. There are things which are happening manually. But also, there are things which are happening digitally. I put our branch at moderate = 5 -7" BB.*

“We are not very low. We are not very high but in the centre. I rate moderate”. KD.

Five (5) of the 15 participants rated the digital maturity of their working environment as low:

“The sad reality is that IT hasn't been able to sort out line speeds and stuff. Most people are frustrated by the system. You will not be innovative in a space where you are constrained by the quality of the infrastructure. I rate low” UP.

“Because of the infrastructural issues. Our infrastructure is so poor that you cannot even try to explore something new on the system” TJ.

In summary, it can be stated that there was no single participant who rated the digital maturity of their work environment high. The majority of participants rated their perspective as moderate. Five (5) participants provided a rating of low. The reasons provided for the ratings were issues like weak ICT infrastructure, lack of capacity and the absence of a coordinated compelling vision of DX in the department.

- ***Sub question 4.2: What can be done to improve or support leaders to facilitate DX in their departments/units?***

All participants reached consensus that capacity building, whether through training, investment on ICT infrastructure, recruitment of people with the appropriate skill set or implementing effective management approaches, is essential and forms a crucial support requirement:

“The leaders must actually be conscientious about the environment, the technological environment. Leaders must be reskilled” AM.

“Human Resource Development should lead the process to the skill audit of the senior management and then recommend a training that will facilitate, empower senior management to be able to be the change agents in terms of the digital transformation” BB.

“Capacity building. Capacity building. The leaders must be capacitated enough. You cannot go and preach without having a theology. We must get the relevant skill for us to be able to share the skill” KR.

“All professionals have CPD points, continued professional development. If you never find time to fill up your car with petrol, somewhere you're going to walk. That's almost the thing with technology. We must build the necessary capacity… “UP.

Capacity building, available resources and a good management approach were considered critical success factors by the majority of participants in an effort to support senior managers in the proper implementation of DX within their department.

4.4 Conclusion

This chapter analysed the participants’ responses in trying to answer the research objectives. A thematic analysis was done in which there was no prior theme. The analysis found that senior managers generally understood digital transformation to be moving from paper to a paperless system. The analysis further found that senior managers’ perceptions of their roles in digital transformation were to lead and act as change agents. Senior managers were also observed to be keen on innovation, but their main constraints included poor ICT infrastructure and a lack of time and space for individuals to innovate. The findings show that, in instances where innovation was happening, it is very sluggish. The digital maturity of the department was rated between low and moderate according to participants’ understanding of their work environment.

CHAPTER 5: DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter discusses and interprets the findings presented in the preceding chapter.

The primary purpose of the study was to explore senior managers' perception of their role in facilitating digital transformation in the public sector in South Africa. The following four (4) research questions were designed to explore the purpose:

- RQ1: What are the senior managers' understanding of digital transformation within the context of their work environment?
- RQ2: How do senior managers perceive the role of leadership in digital transformation journey?
- RQ3: What is the senior managers' perception of innovation in the digital transformation journey?
- RQ 4: How do senior managers describe the organisation's current digital maturity status?

The structure of this chapter is as follows:

- Section 5.1: Research questions discussion
- Section 5.2.1: RQ1 – discusses senior managers' understanding of DX within the context of their work environment
- Section 5.2.2: RQ2 – discusses how senior managers perceive their role of leadership in Dx journey
- Section 5.2.3: RQ3 – discusses senior managers' perception of innovation in the DX journey
- Section 5.2.4: RQ4 – discusses how senior managers describe the organisation's current digital maturity status
- Section 5.3**:** Conclusion

5.2 Research questions discussion

5.2.1 RQ 1: What are senior managers understanding of digital transformation within the context of their work environment?

This study unveiled that the focal point of senior managers' understanding primarily revolves around digitisation. Armstrong and Lee (2021) and CDDG (2021) defined digitisation as the conversion of data from analogue to digital or binary. The collective understanding of participants was that DX is about moving from a manual/paper-based environment to a paperless environment or electronic space. It also became clear that the concepts digitisation, digitalisation, fourth industrial revolution and digital transformation are used interchangeably without attaching the real meaning to each. This confirms the argument by Nachit et al. (2021) that digital transformation in the public sector is a subject that is still at the inception stage. It also confirms findings by Mergel et al. (2019) that digitisation, digitalisation and DX are used synonymously.

Participants agreed that DX will improve efficiency, effectiveness and reduce the cost of farming. However, their understanding of DX was limited to the use of internet, emails, MS Teams, scanning etc. with no interaction and integration across the various departments and units to achieve better government. This finding indicates that the senior managers did not yet grasp the full nature, scope and intention of a digital transformation process as defined by Isabirye et al. (2012), Armstrong and Lee (2021), Chaffey (2015), Mergel (2021) and Codagnone et al. (2020) who all put emphasis on the fundamental changes of organisational structures for the benefit of customers or the public not a "plug and play" inward looking kind of situation. Furthermore, it underscores the recommendation of the OECD report (2014) that there is a need to shift from e-government to digital government as one of the key strategies towards the DX in the public sector.

The majority of the participants (12 of the 15) agreed with Armstrong and Lee's (2021) definition of digital transformation, while two (2) of the 15 partly agreed with it. Those in agreement appreciated the inclusion of "change or change

management" in the definition. The participants who partly agreed expressed their reservations on the definition's lack of human development and the inclusion of technological disruptions. According to their understanding, DX should focus on human capital development. They advocate for implementing DX from the ground up to prevent any disruptions. The findings reflect senior managers limited or poor understanding of the concept. A further finding highlights that senior managers perceive DX as the responsibility of the Information and Communications Technology (ICT) unit. They believed that the ICT unit should educate them on the latest ICT developments and oversee their implementation, as the managers were primarily focussed on their core functions.

The participants were of the opinion that the age difference among senior managers contributed towards the different understandings of DX within their work environment. The older senior managers were considered to be reluctant to adopt change and DX compared to their younger counterparts. The reasons cited for their reluctance were a lack of knowledge of digital platforms and devices, educational background, familiarity with a paper laden work environment and the fear that technology would replace the human factor in the workplace. The researcher can only draw an inference that older senior managers view DX as an interference in their work environment.

The preceding paragraph also lays bare the misalignment in senior managers' understanding of DX. This study identified the key driver behind misalignment as silo approaches of branches in DX and how they conduct their business. A key objective of DX is the integration of digital technology into all areas of business (Isabirye et al., 2012; AlAhmari, 2022). Stone (2019) and Codagnone et al. (2020) argue that DX is the development of a unified platform for the benefit of greater openness and collaboration within and beyond governmental boundaries. It seems, from this study, that the integrated nature of an institutional digital transformation process, is not yet fully understood and practiced within all departments or units. The misalignment in DX understanding is characterised by senior managers' identification of technological tools such as scanning of files, storage of information on clouds and retrieval by the push of a button, provision of laptops, 3G cards and mobile phones to staff, emails, use of drones etc.

depending on their branches' focus and with no cross functional - collaboration element. The majority of participants were of the opinion that the senior managers were misaligned in terms of their understanding of the concept, while three (3) participants felt that the Covid 19 pandemic assisted in reducing the misalignment. It seems that there was an absence of a clear, single compelling vision of what is DX, what the Department's internal and external stakeholders (i.e. employees, farmers, service providers etc.) stand to benefit if it is properly implemented. The absence of such has a potential to frustrate DX efforts.

The vast majority of participants (14 of 15) were in consensus that the DX failure rate of the public sector is quite high. Checinski et al. (2019) state that the public sector transformation failure rate is high at 80%, compared to that of the private sector at 74%. Almost half of the participants ascribed the failure rate to bureaucracy followed by a lack of capacity or training of senior managers at (2/15). It thus seems that the department's hierarchical structure and lack of capacity impeded the implementation of DX initiatives for the benefit of both staff and public. These findings correspond with the perspective of Kane et al. (2019) that the real challenge of digital transformation processes relates to people and their attitudes and mindsets, rather than to technological challenges as such.

Notwithstanding the above, the study demonstrates the positive impact of technological developments on the agricultural sector. The in-depth interviews revealed that the impact is far reaching from precision agriculture, improved productivity, easy access to information for informed decision making, reduced cost of farming, effectiveness and efficiency to drones usage and tracking devices in the fight against stock theft and crops monitoring. This analysis supports the assertion by Schwab (2016) that the fourth industrial revolution is redefining how public institutions and organisations operate. However, two (2) of the 15 participants raised issues of job losses due to the introduction of technology, either because of skills shortage, age or digital divide**.** Their views are augmented by the work of Schwab (2016) who put it very succinctly that modern technologies will change the nature of work in all industries and occupations while Armstrong and Lee (2021) argued that the fourth industrial revolution (4IR) is triggering the

disappearance or radical changes in conventional processes, organisational forms, strategies and jobs.

5.2.2 RQ2: How do senior managers perceive the role of leadership in digital transformation journey?

The findings indicate a fair to average/good understanding that managers should ideally fulfil a leading role in the DX journey of the department (8/15) while others highlight the importance of fulfilling a change agent role (5/15) and/or driving the strategy within the digital transformation process (3/15). Smith (2010) and Burns (2020) argue that leadership is about setting a direction. Alahmari (2022) further emphasises that this direction is aimed towards the achievement of goals. According to Ehlers and Lazenby (2010), strategy is an effort or deliberate action that an organisation implements to outperform its rivals. Armstrong and Lee (2021) argue that magic happens when great leadership and great strategy are combined. To put it succinctly, senior managers' role is to provide strategic direction and mobilise the resources (e.g. finances, staff etc.) for the achievement of the set targets.

However, despite the managers' understanding that they need to fulfil a leading, change agent or strategic role within the DX process, it seems that senior managers are not yet fully successful in creating momentum within their respective units or departments. Almost half of the respondents indicated that no momentum was being created by senior managers. A few (4/15) pointed to insufficient or inappropriate momentum while another four (4) out of the 15 thought that the right momentum was being created – though confined to the respective branches. Westerman et al. (2014) argue that senior leaders should create the appropriate momentum around digital transformation. The reluctance or inability of leaders to create appropriate momentum is tantamount to a lack of support. Andersson et al. (2018) argue that digitisation can only be successful if top management support is secured. The silo approach of the department and inappropriate momentum have a diminishing effect on the departmental effort to digitally transform and they are as good as no momentum at all. The departmental senior management needs to create a compelling shared vision to enhance the

ability and instil confidence in senior managers to build appropriate momentum in the DX journey of the department.

Slightly less than half of the participants (6/15) indicated that they played a role in the digital transformation journey of their units or departments. The participants identified the roles they played individually as ranging from consultation with external stakeholders on the DX efforts of the unit, training of staff, provision of laptops to junior staff, introduction of electronic attendance registers and electronic signatures during Covid 19 pandemic and designing and writing of software – Survey 123 and the development of an e – tool model. The participants were of the opinion that their individual roles impacted positively on the department because it led to convinced stakeholders to adopt systems that would fit into the DX efforts of their units for interoperability purpose and the department achieved the clean audit.

A third (4/15) of the participants characterised their roles as part of the team that dealt with the ICT integration framework, electronic sifting of long and short lists, placing of adverts on social media and the development of System Production Monitoring Tool. They argued that the impact was a synchronised integrated system, reduced turnaround time in recruitment and access to real time information. Another third of the participants (5/15) indicated they played no role in the DX journey of their units, neither as individuals nor as part of the team. According to Ehlers and Lazenby (2010), leaders are individuals who are more experimental, visionary, flexible and creative, and value the intuitive side of their work. The participants reflected a gap in terms of digital leadership skills and the requirement for investment in upskilling of managers to fulfil an active role in DX journey of the department.

All the participants agreed that leadership has a role to play in aligning Information Technology (IT) strategy and Organisational strategy. Armstrong and Lee (2021), in their “Unified Model of Digital Maturity”, argue that leadership and strategy are the drivers of digital transformation and the frameworks and structures within which the transformation journey happens. The participants were not in agreement as to whether IT strategy must fit into organisational strategy or vice versa in the alignment efforts. According to Armstrong and Lee

(2021)**,** the organisational strategy delivers the purpose, vision, mission and values. The authors synonymise organisational strategy with digital strategy on the ground that these strategies are both interlaced in everything an organisation performs. The authors further argue that the IT strategy concentrates on IT architecture, IT design, IT operations to ensure IT platforms and systems deliver the organisational (digital) strategy. This implies that the IT strategy fits into organisational strategy for the latter to achieve its purpose. Figure 5.1 below is an adjusted demonstration of the nature of relationship between the two strategies.

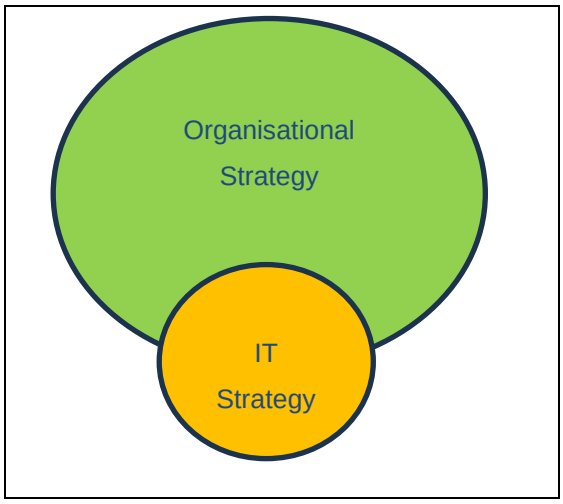


Figure 5. 1: Nature of relationship between organisational and IT strategies

Figure 5.2. below illustrates the role senior managers should play in the DX journey of the department. According to Westerman et al. (2014) leaders should facilitate the digital transformation change process by focusing on four main phases, namely (1) framing the digital challenge, (2) focussing investment, (3) mobilising the organisation and (4) sustaining the digital transition.



Figure 5. 2: The digital transformation compass,

Source: Westerman et al, 2014. P. 174

In their study on the role of management in promoting digital transformation within companies, Porfírio, Carrilho, Felicio and Jardim (2021) describe the facilitative role of managers as demonstrating democratic, inclusive leadership styles, higher levels of clarity and consistency in terms of the mission of an organisation and higher efficacy related to strategic management practices.

5.2.3 RQ3: What is the senior managers perception of innovation in the digital transformation journey?

All the participants agreed that innovation in the public sector refers to significant improvements to public administration and/or service as per the study by OECD (2012). However, half of the participants confirmed that innovation was happening within the department while the remaining participants disagreed with this view. The lack of innovation was found to be inadequate space and resources for innovation within the organisation. The participants indicated that different views on innovation were influenced by independent developments within

specific branches. The participants were aware of the importance of innovation and the critical role it plays in the digital transformation process of the departments. However, it seems that there is a gap in terms of the awareness about the importance of innovation and pursuing innovation as an inherent element or dimensions of the digital transformation journey. The main message is that you cannot transform digitally if there is no innovation and there will be limited innovation if there is no digital transformation. According to Rogers (2016), digital technologies are changing how businesses innovate. The finding does point to a strong relevance of innovation in influencing digital transformation.

It is clear from the findings that innovation or improvements made within the department were mostly during the Covid19 pandemic, where software was developed to engage small scale farmers in one of the projects. The work of Mazzucato et al. (2021) highlights several principles and approaches that could assist leadership in enhancing the innovative abilities of their institutions. These are:

- To build in-house capabilities and skills focussed on adaptability and learning.
- To democratise innovation through creation of a new interface and diffusion platform to continuously engage citizens, public and private sector innovators.
- To construct data infrastructure and public digital platforms for provision of both credible evidence and accurate information to combat disinformation and cybersecurity issues and amplify equitable access to public services by all.
- To explore new mechanisms to accelerate cross-cutting learning. e.g. provision of bursaries for short courses in DX, Artificial Intelligence etc.

According to Teece (2007), leadership's role is to make quality decisions, communicate adherence to innovation and efficiency goals, values and expectations and to motivate employees and other role players. It seems from

the findings that there is still significant room for growth in the department related to innovation and its critical role within the digital transformation process.

The observation is that the senior managers are stuck in the departments' current operational mode. They are more skewed towards utilising their ordinary capabilities and concerned with the achievements of defined targets and they have accepted that the organisation cannot innovate or has reached innovation ceiling. The picture painted above is in sharp contrast with Teece's (2018) Dynamic Capabilities Framework that puts great emphasis on the utilisation of dynamic capabilities for the organisation to evolve and meet the ever-changing needs of the citizens. Schoemaker et al. (2018) linked dynamic capabilities to the bridge between the present and future while Kattel and Takala (2021) refer to public sector dynamic capabilities as a platform for public organisations to be more proactive in tackling challenges. The study seems to suggest that senior managers are not able to align and integrate the organisational capabilities (ordinary and dynamic), resources (generic and VRIN) and the strategy, resulting in an innovation plateau.

The finding that the senior managers are aware of the critical importance of innovation in the digital transformation of the department, but seems unable to pursue it, suggests that they lack both seizing and transforming capabilities which deprive citizens of improved services. According to Teece (2018), seizing capabilities influence the quickness of the organisation to respond to identified opportunities and threats while transforming ones maintain the alignment and integration of the whole organisation.

5.2.4 RQ4: How do senior managers describe the organisation's current digital maturity status?

Digital maturity can also be described as a process: Teichert (2019) argues that digital maturity is a dynamic concept because of the continuously changing digital landscape while Kane (2017) describes digital maturity as a gradual process of becoming mature that unfolds across an organisation over time. Utilising the definition of Armstrong and Lee (2021) _as the point of comparison, most of the participants rated the digital maturity level of the department as low to moderate.

There were no participants who gave a rating of high. The general view was that there was some work being done, hence a moderate level of digital maturity. However, the participants felt that the department needs to invest in ICT (or IT) infrastructure and reduce red tape because they impede efforts to transform. The participants confirmed Teece's (2007) argument that decision making in hierarchical organisations is painfully slow and has a potential to muzzle innovation or reinforce the status quo. The author further argues that, in the era of rapid technological innovations, the organisations need to strategise around investment decisions by ensuring the right timing, increased return advantages and long-term opportunities to leverage products and services from one application to another.

The training of all the departmental staff on DX and/or technology and deliberate change management were cited by participants as part of the support required for leaders to facilitate the DX of the department. Warnich et al. (2015) defined training as processes whereby people acquire capabilities to help them in the achievement of organisational goals. Schoemaker et al. (2018) emphasised the need for strategic leadership or entrepreneurial management that possess dynamic capabilities for their organisation to cope with the rapid technological changes and disruptions to remain relevant. Teece (2018) argues that dynamic capabilities are inclusive of a clear and detailed management/ leadership role in facilitating internal systemic organisational change and to maintain external organisation fitness. The author mentioned the management/leadership roles as sensing, seizing and transforming/reconfiguration.

The senior managers' awareness of their environment and potential changes in their ecosystem, is critical in planning the repositioning of the department to navigate through rapid technological changes and to initiate the DX journey with reasonable information at their disposal. They are also expected to seize the opportunities through making informed investment decisions. Availing required resources involves actions such as investing in ICT infrastructure, appointing people with requisite skills, reviewing organisational structure, processes, procedures, policies, creating a new culture and continue with the facilitation of DX. Ultimately, the aim is to transform the department into a fit-for- purpose

organisation that is responsive, able to create and co-create value for all the stakeholders in a modern organisation. Rogers (2016) argues that DX is about strategy and new ways of thinking, not technology. It confirms that, for senior managers to create value, to improve the quality of services and to transform the department, there is a need to change how they see and do the business.

According to Schoemaker et al. (2018), the strategic leaders possess six (6) critically distinct characteristics/skills required to facilitate DX in an organisation. Table 5.1 below displays and describes these skills:

Skills	**Descriptions**
Anticipate	Most leaders focus on what is directly ahead, lacking "peripheral vision." This leaves them vulnerable to rivals who detect and act on ambiguous signals. Leaders who anticipate: • Look for game-changing information at the periphery • Search beyond current boundaries • Build wide networks to help them scan the horizon
Challenge	Critical thinkers' question everything. They tend to: • Reframe problems to understand root causes • Challenge current beliefs and mind-sets • Uncover hypocrisy, manipulation, and bias
Interpret	The strategic leader holds steady, synthesising information from many sources before developing a viewpoint. Savvy sense makers: • Seek to understand patterns from multiple data points • Engage others to weigh, filter and develop insights • Check for decision biases and test multiple hypotheses

Decide	Strategic leaders use process and discipline to arrive at a "good enough" position. They tend to: • Carefully frame the decision and approach • Balance speed, rigor, quality and agility • Make (asset light) commitments even with incomplete information
Align	A strategic leader must foster open dialogue and engage key stakeholders, especially when views diverge. An alignment-focussed leader can: • Understand what drives diverse agendas and is hidden • Ensure tough issues are surfaced to pinpoint misalignment • Provide a compelling strategic vision
Learn	Strategic leaders embrace and encourage feedback, viewing success and failure as sources of critical insight. Learning leaders: • Encourage and exemplify transparent, rigorous debriefs • Stay agile and course-correct quickly if off track • Celebrate success and the right kind of failures

Table 5. 1: Skills and descriptions

Source: Innovation, dynamic capabilities, and leadership. California Management Review 2018, Vol. 61(1) 15–42. P. 30. Schoemaker, Heaton & Teece.

5.3 Conclusion

The study revealed that senior managers' understanding of the concept DX is misaligned which is ascribed to silo approaches within the department. Interestingly, the senior managers' general understanding of the study itself was

limited to a movement from paper to a paperless system. However, efficiency and effectiveness are considered as the main positive spinoffs of DX. Research participants confirmed the role of leadership (senior managers) in facilitating DX within the department. However, it seems that the challenge is the inability of senior managers to build appropriate momentum around DX. To curb the challenges of silo approaches and an innovation plateau, senior managers should start reshaping the departmental culture guided by “The Unified Model of Digital Maturity” and “Dynamic Capabilities Framework. They should lead the department into being a learning organisation, characterised by agile but aligned integrated organisational structure and systems.

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter includes a consolidation of the findings presented in the previous chapters to answer the four (4) research questions. The structure of the chapter is as follows:

- Section 6.2: Conclusions regarding the Research Question 1
- Section 6.3: Conclusions regarding the Research Question 2
- Section 6.4: Conclusions regarding the Research Question 3
- Section 6.5: Conclusions regarding the Research Question 4
- Section 6.6: Recommendations
- Section 6.7: Suggestion for any further research

6.2 Conclusions regarding research question 1

What are the senior managers understanding of digital transformation within the context of their work environment?

Firstly, it seems that the senior managers understand DX as a simple movement from paper a to a paperless environment. Their characterisation of DX is related to the use of internet, emails, MS Teams, scanning, uploading and retrieving of documents, 3G cards, use of drones etc. Secondly, they understand the DX to be the function of the ICT (IT) unit and not theirs because they are preoccupied with their core line functions. Thirdly, they understand DX to mean the same thing as digitisation, digitalisation and fourth industrial revolution. Fourthly, their understanding of DX is misaligned. The misaligned understanding is characterised by the identification and mentioning of technological tools like 3G cards, emails, provisioning of laptops and mobile phones to staff, information storage on clouds, scanning of files, use of drones etc. as DX. Their misalignment source is traced back to a silo approach of branches and how branches conduct their business. Fifthly, they confirm DX high failure rate in their work environment and ascribe it to bureaucracy and a lack of capacity. Finally,

they understand DX is an instrument to improve efficiency, effectiveness and reduce cost of farming.

The senior managers' understanding is quite far removed from the scholarly discourse on DX. The fact that senior managers consider DX as a movement from paper to a paperless system or digitisation, suggests that DX is a cosmetic change exercise that converts the current processes and procedures into an electronic system without fundamental organisational changes that would result in an interoperable environment and an integrated system to improve internal efficiency and cross - functional collaboration. The improved internal efficiency, effectiveness and cross - functional collaboration should lead towards the dismantling of branches' silo approach and alignment of their understanding (Alahmari, 2022. Stone, 2019).The understanding also contradicts the theory that emphasises e-government as a means towards the digital government, not an end itself. The understanding that paints DX as the exclusive purview of the ICT unit is problematic because it is in sharp contrast with the work of different scholars who emphasise the critical role of leadership in the DX journey of any organisation. Simply put, senior managers understanding is abdication of their responsibility.

The understanding of the DX high failure rate in the public sector is ascribed to bureaucracy and a lack of capacity and is confirmed by the findings of previously published works. The departmental organisational structure is hierarchical and fixed in nature. The facilitation of DX requires agile organisational structure for quick decision making and to pivot in the face of rapid technological changes. The lack of capacity, either in the form of human or financial resources, is bound to impede the successful facilitation of DX within the department.

6.3 Conclusions regarding research question 2

How do senior managers perceive the role of leadership in digital transformation journey?

The findings suggest a fair to good/average understanding of senior managers' role of leaders in the DX journey. The dominant perception is that leaders should

play a leading role. The other perceptions are that leaders should fulfil a change agent role and/or they should drive strategy in the DX journey of the organisation.

The senior managers' perception of the role of leaders proved to be in line with the understanding of many published works on leadership or digital leadership. The findings seem to suggest a gap between senior managers' understanding and the actual application of their understanding. Again, the departmental silo approach and lack of capacity or leadership skills appear to be the barriers in the creation of a shared compelling vision. The gap renders senior managers impotent in the DX journey of the department.

The test of creating appropriate momentum in DX as argued by many leaders in DX appears to be a slippery slope for senior managers. The observation above is augmented by the nature of roles played by senior managers in DX and the impact thereof. The findings suggest a minor or no role at all played by the senior managers with minimal or no impact. The role of leaders in aligning both Organisational and ICT (IT) strategies is confirmed by the findings. However, the degree of misalignment arises when determining whether the ICT (IT) strategy should align with Organisational strategy or vice versa. Different studies have confirmed that ICT strategy must fit into the Organisational strategy as the best form of alignment.

6.4 Conclusions regarding research question 3

What is the senior managers' perception of innovation in the digital transformation journey?

The senior managers' perception of innovation in the DX journey refers to significant improvements to public administration and/or services. The findings support the findings of previously works on innovation in the public sector. However, senior managers expressed two different opinions on whether innovation was happening within the department or not. The study suggests that the base for diametrically opposed views on the existence or non-existence of innovation in the department is the silo approach or mentality. The branches are operating independently of each other which affects how senior managers

perceive the presence or absence of innovation. The branches developed or procured systems that are branch specific with no interoperability function or ability and senior managers view that as innovation in the DX journey of the department. The findings further suggest a gap between knowing the importance of innovation and pursuing innovation. It is possible that this could be ascribed to the hierarchical organisational structure of the department characterised by "command and control" with no platform to experiment or no room for failures. The setup itself inhibits the conducive environment of learning and development.

The research participants indicated that there should be a strong link between innovation and DX, which is in support of the DX discourse. The main argument that was identified is that there will be no DX in the absence of innovation and innovation is bound to be constrained in the absence of DX. It is worth noting that the Covid 19 disruption resulted in the department producing some innovative ways of service delivery to the farming community. It also appears that the department has not been able to sustain the momentum but regressed to the prior Covid 19 pandemic setup.

6.5 Conclusions regarding research question 4

How do senior managers describe the organisation's current digital maturity status?

The dominant description of senior managers' current digital maturity of the department is moderate. Their description was based on the understanding that there was some work being done in an effort to transform. There was also reasonable number of dissenting views that described the digital maturity status of the organisation as low. Their view was that the department was shy to invest in technology and that resulted in a poor ICT infrastructure which is the base of DX. The senior managers' understanding of digital maturity is also in support of the previous work of Armstrong and Lee (2021) which was used as a point of comparison. The dichotomy can possibly be traced back to the silo approach of the department, poor leadership, red tape and a skewed allocation of resources per branch. It is possible that, in some branches, leadership is open to new ideas

and moves with reasonable speed to expedite the approval of resources allocation and implementation, while in others the opposite is true.

The findings suggest that the senior managers of the department lack the technical knowledge in facilitation of DX. The requirement for training and change management stand out as the primary priority in terms of the nature of support required for senior managers to successfully facilitate DX. This confirms the earlier suggestion. It also became apparent that senior managers' efforts to transform might be constrained by their limited understanding of DX. It is impossible to implement what you do not know.

6.6 Recommendations

The following are the recommendations to the senior managers in their endeavour to facilitate digital transformation in the department:

- The senior managers should capacitate and upskill themselves on DX to properly and confidently kick start the department digital transformation journey. It was found that senior managers' knowledge and understanding of DX are limited.

- They should understand their role of leading, of being change agents, of creating a shared compelling vision, of influencing and shaping departmental culture through engaging the staff on the need for fundamental changes within the department with the possible benefits of modernised, responsive, agile, cross - functional collaboration, aligned and integrated organisation. Silo approaches/mentality was identified as the main source of misalignment and one of the main barriers to DX.

- They should advocate for a circular organisational structure characterised by decentralised decision making to cut red tape, improved communication, reasonable appetite to experiment and innovate and inclusive organisation. The current hierarchical structure is characterised by "command and control" approach, marked by bureaucratic decision-

making processes and a risk-averse culture. The factors pose obstacles that hinder innovation and entrepreneurial initiatives among managers.

- They should be champions of continuous learning in words and actions, to build a learning organisation and leverage the skill sets of employees through affording them time, money and space to express themselves. The gap identified between understanding the importance of innovation in DX and the actual application epitomise the department as an “anti – continuous learning organisation”.

- Senior managers should take informed investment decisions regarding ICT (IT) infrastructure and tools and the recruitment of the right talent to drive the strategic objectives of the department in an integrated manner. The poor ICT infrastructure of the department is one of the impeders of DX.

- They should develop a digital transformation strategy that not only fosters a shared vision but also a focal point for mobilising resources (human, financial etc.). This strategy will be instrumental in effectively implementing DX and navigating through technological disruptions.

6.7 Suggestions for further research

The topic of DX in the public sector remains relatively new, especially in the South African context. This study discussed the perception of senior managers in terms of their role in facilitating DX in the public sector with the Department of Agriculture, Land Reform and Rural Development as the case study. The transferability of the findings to the whole of public service is not certain. The following topics require further research:

- Identification of skills gaps and research on best approaches for upskilling and reskilling of staff during the digital transformation journey of the organisation.

- Studies on international best practices of facilitating digital transformation in governmental departments with specific reference to the agricultural sector.
- Research on assessing the digital maturity level of governmental departments and initiatives or viable options for accelerating the process.
- Research on digital transformation leadership development approaches to address skills gaps.
- Research on how to bridge the failure rate gap between public and private sectors in the implementation of digital transformation.

6.8 Potential limitations of the study

The study has the following potential limitations:

- The exclusion of an up-to-date evaluation of the digital maturity status of the department in exploring senior managers' perception of their role in DX might impact on the transferability of the study.
- The study was qualitative in nature with the intention to explore the nuances/themes but requires a quantitative approach to generalise.
- The study focussed on leadership self-perception (or self-assessment) and it is possible that the study could have obtained a more nuanced perspective through the eyes of ordinary employees' view of leadership behaviour.
- The sample size of 15 vis-à-vis the total population of 386 as per the departmental annual report of 2020/21 might be considered small and therefore not provide a complete or balanced picture of senior management's perception of their role in facilitating DX within the department.

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APPENDIX A: DIGITAL MATURITY MODEL FACTORS

Factors	Indicators	Measures, elaboration
Vision & Strategy	Transformative scope of vision	Strategic digital and business innovation
		Compelling digital vision
		Bold long-term orientation
		Organisation has defined and initial digital vision
		Leaders have a compelling long- term vision
		The nature and focus of your organisational purpose or mission
	Leadership alignment and commitment, from board to floor	Digital commitment, prioritisation and focus
		Strong management commitment
		All staff work in sync with digital vision
		"Our leadership makes digital transformation a necessity, enforces behaviours and keeps programs chartered and aligned with the external perspective in mind"

Factors	Indicators	Measures, elaboration
Vision & Strategy	**Vision Integrated to business strategy and translated to digital strategy & plan**	"It is among out top 3 Board – level priorities"
		Scope and clarity of digital vision
		Clear and objective assessment of starting point
		Intent and outcomes; specific yet flexible
		Formal digital strategy in place
		Exploration and evaluation of contemporary trends (foresight)
		Development / execution of a strategy using digital technology to do business in fundamentally new ways
		Digital transformation linked to business strategy
		Digital transformation roadmap
		Digital technology realises the vision of the organisation
	Sufficient investment & resource allocation in digital transformation	Allocation of resources
		Adequate resource allocation
		"We are able to invest in new ventures even if they compete with our current business"

Factors	Indicators	Measures, elaboration
Culture	**Approach to risk taking and failure**	Readiness to take risk
		Failure culture/no blame culture
		Risk tolerance, appetite and practice
		Failure tolerance; no blame culture
		"We accept failure in new ventures but look to reduce cost and increase learning"
		Encourage experimentation and risk taking; tolerate failure
		"We have a risk receptive culture that encourages innovation and experimentation"
		Failure tolerance and learning orientation
		Freedom to experiment and failure tolerance
		Readiness to take risk
		Failure culture/no blame culture
	Organisational learning, exploration & experimentation	Organisational learning: learning from failures, test & learn, experimenting, organisational mutual / continuous learning
		"We are skilled at taking successful new ideas and integrating them across the organisation.

Factors	Indicators	Measures, elaboration
Culture	**Leadership culture and transformation**	Leadership behaviour; walk the talk
		Strong digital leadership
		Change-ability: Open/willing to change ways of work, change ability, ability of organisation to constantly reinvent itself
		Openness to modern technologies
	Collaboration culture	Leadership team learning modern technologies
		Leaders actively identify and realise new opportunities, foster collaboration
		Collaboration: across company boundaries, cross-company /functional collaboration
		Cross functional collaboration
		Knowledge sharing
Organisation and governance	**Agile, empowering organisational structure**	Organisational agility and “ambidexterity”
		Organisational agility
		Empowerment, decentralised decision making
		Management structure/practices support digital business
		Agile management

Factors	Indicators	Measures, elaboration
Organisation and governance	**Agile, empowering organisational structure**	Assessing risk factors, risk management,
		Hierarchical structures vs. small, multi-disciplinary, self-organising teams
		Organisational agility and flexibility
	Digital organisation and structures	Digital team set-up
		Organisation-wide participation/adoption
		[Digital] governance
		Adaptation/use of existing structures
		Decision at the top vs. decentralisation
		Defined accountable leadership
		Establishment of specialised units
		Digital skills embedded throughout the organisation
		Roles/tasks related to digitalisation defined
		Cross-functional teams to implement digital business priorities
		Personnel dedicated to I4.0
		Ensuring comprehensive/reliable execution of digital strategy

Factors	Indicators	Measures, elaboration
Organisation and governance	Digital organisation and structures	Engagement on different hierarchical levels
		Standard and regulations
		Existence of central coordination for I4.0 or digital transformation
		"We have well-established organisational structures for digital governance which include specialised committees as well as individual roles"
		Well defined digital structures with clear mandates
	Ecosystem Engagement	Partner network
		Crowdsource employees
		Partnerships and ecosystems
		The organisations work as part of a digital ecosystem
		Digitisation/integration of vertical/horizontal value chains
		Digital connection with the business network (e.g., through APIs)
		Extent of contractors vs. staff
		Extent of outsourcing
		Usership vs. ownership
		Strategic use of community inputs
		Open interfaces to ecosystem
		Partnership orientation and leverage

Factors	Indicators	Measures, elaboration
Organisation and governance	**Change Management**	Systematic approaches are taken to change management
		"We have a formal enterprise-wide change management capability, which has been fine-tuned for the broader and deeper change impacts brought about by digital transformation initiatives"
	Data governance	Our data is organised to be accessible by all divisions of the company
Digital Ethics	**Participation and access**	Suggestion box or other anonymous issue reporting system. Whistle-blower mechanism
		Provision of internal ombudsman services.
		Commitment to visiting committee review and accreditation
		Firmwide participation, engagement with business partners and stakeholders, engagement with customers and the wider public.
	Integration into product design and business processes	Digital Ethics checkpoints throughout iteration/design stages
		Customer focus groups
		Post – release follow up
		Accountability of digital ethics with governance structure
		Regular Internal Survey of continued relevance and application of principles.

Factors	Indicators	Measures, elaboration
Digital Ethics	Transparency and awareness	Review process for consistency with documented rationale.
		External expertise in the development and assessment of digital ethics principles.
		Interdisciplinary advisory board of academics with transparency of representation.
		Ethics incubator that convenes publicly and reports out to board and senior executives.
		The dissemination of effective explanatory materials.
		Optional Professional Development training to interested parties
		Explicit, well explained digital ethics principles. Holding firm to account publicly on digital ethics principles.
	Cultural alignment	Engagement with representative of the market the firm operates in.
		Interdisciplinary viewpoint diversity within the development team
New Business Models	Platform business usage	“We look to create value through platforms and external networks”
		“Platform business models are already a core part of our digital transformation strategy”

Factors	Indicators	Measures, elaboration
New Business Models	Use of data as a strategic asset	Creating value out of data
		Our data strategy is focussed on how to turn data into new value
		We manage our data as a strategic asset we are building overtime
		Extend of harnessing data as an asset
	Value proposition evolution	Use of five reinvention architypes
		Development of disruptive business models, using agile methods.
		“We aim to adapt early, to stay ahead of the curve of change”
		“Our value proposition is defined by changing customer needs”
	Cooperation as a new source of value; asymmetric competitors as new threats	“We are open to cooperating with our rivals and to compete with our partners”
		“We view our competition as broader than our current industry”

Factors	Indicators	Measures, elaboration
Innovation	**Lean and open Innovation**	Orchestrating vs./and unleashing
		Ideating new digitalised working methods and services: Employees encouraged to ideate new digitised working methods/services, value of ICT in company.
		We innovate in rapid cycles, using prototypes to learn quickly.
		Use of Lean Innovation
	Level and accessibility of funding	Funding for innovation
		“We are able to seed and develop new ideas that are unusual for our business”
		“We major investments specifically allocated to digital transformation”
		Level and modes of funding and investment and RoI approach.
	Strategic approach to innovation	Innovation capability
		Corporate Venturing
		Innovation conducted regularly

Factors	Indicators	Measures, elaboration
Innovation	**Strategic approach to innovation**	Systematic approaches are taken to innovation
		"We have formal enterprise-wide innovation program, which has been fine-tuned for our digital transformation objectives, and which enables continuous and collaborative innovation"
		Innovation model and risk tolerance
Customer orientation & engagement	**Customer participation and engagement**	Customer involvement in product development and experience enhancement.
		Customer centric culture; outside-in focus
		Customer involvement on product development
		Customer centricity: centred around customer needs, customer focus and alignment.
		Customer participation and empowerment
		Involving customers in innovation processes
	Use of analytics for personalisation and targeting	Use of Analytics and insights for customer engagement and experience enhancement
		Use of data analytics (personalisation, targeting)

Factors	Indicators	Measures, elaboration
Customer orientation & engagement	**Use of analytics for personalisation and targeting**	Customer benefit from digitisation; personalisation of products/services
		Utilizing Customer Insight & Experience digital services to engage customers
		Data analytics deployed for individualisation
	Digital engagement and marketing	Digital marketing communication
		“We use marketing to attract, engage, inspire, and collaborate with customers”
		Our customer’s advocacy is the biggest influence on our brand and reputation”
	Digital Channels and Omni-Channel	Optimise digital channels
		Seamless hybrid physical-digital channels
		Hybrid customer interaction channels
		“We are focussed on our customers’ changing digital habits and path to purchase”
	Use of tech in customer touchpoints	Digitalisation of customer touchpoints

Factors	Indicators	Measures, elaboration
Customer orientation & engagement	**Customer value focus**	Customer experience [excellence]
		Focus on customer value
		Our priority is maximising shareholders return, vs. our first priority is creating value for customers
		"[Customer value focus] drives all our initiatives and we continuously adjust based on changing"
		Customer experience (approach to and extent of digitalisation thereof)
Product innovation	**Social functionality built into products**	Social functionality and collaboration a central element of products
	Products & UX differentiated by emerging & disruptive technologies	Exploitation of modern technologies [in products]
		Digitisation of product/service offerings
		Digital product/service portfolio with software, network (M2M) and data as a key differentiator
		"We assess new technologies by how they could create new value for our customers"

Factors	Indicators	Measures, elaboration
Product innovation	**Information Based Products & services**	Information intensity of products
		Products and services (approach to and extent of digitalisation thereof)
	Products and UX differentiated by digital features	Smart products/services
		Digital features in products and UX
		Use of data and analytics in products
	Products monetise data assets	Data – based services
Workforce enablement and performance	**Employee awareness and alignment**	Digital affinity and competency
		Connect and engage in conversation regarding digital transformation
		Manage resistance: transparency, openness
		Openness of communication, transparency
		Community communication structure
		Crowd-to-community conversion approach (of employees)

Factors	Indicators	Measures, elaboration
Workforce enablement and performance	**Employee empowerment**	Management support for employees to transform
		Controlling vs./and innovating
		Everyone has mandate to think creatively and innovate
		“We make decisions by analysis, debate, and seniority, vs. We make decisions through experiments and testing whenever possible”
		Extent of authority / decision making decentralisation
	Use of digital tools	Use of social technologies
		Data empowered decision making
		Digital capabilities enabling a more flexible/agile way of working
		Use of digital collaboration tools
		Use of gamification
		Use of advanced social tools for knowledge-sharing, communication, coordination and/or collaboration

Factors	Indicators	Measures, elaboration
Workforce enablement and performance	**Breadth and depth of current digital skills**	Experience design capabilities (including channels and their integration)
		Digital skills, expertise, experience and interest
		ICT Digital Skills competencies of employees
		Employees have access to digital skills/expertise as needed
		“We have strong digital skills embedded in all strategic areas and programs”
		“We have mastery of five or six of the key capabilities”
		People and (digital) skills
	Digital skills development	Deal with the digital divide; raise the digital quotient of the company
		Digital skills development
		Education and development of new skills
	Learning and KM environment	Knowledge management

Factors	Indicators	Measures, elaboration
Workforce enablement and performance	Performance measurement and management	[Fostering and managing] teamwork across the organisation (and outside)
		Performance measurement
		"Our business metrics adapt to suit changes in strategy and the maturity of a line business"
		"Managers are accountable and rewarded for long-term goals and new strategies"
	Flexible workplace	Flexible working
		Flexible working arrangements
		Agility and flexibility: flexible working, speed, agility, quickly sensing/responding to changes in the environment, external orientation
		Flexible communities
Core process digitisation	Dashboards	Extent and nature of use of metrics (e.g., use of lean-start-up metrics)
	Automation of core processes	Automation
		Use digital to eliminate bottlenecks and inefficiencies

Factors	Indicators	Measures, elaboration
Core process digitisation	**Automation of core processes**	Digitisation of core systems
		Process digitisation and automation
		Operations and processes (approach to and extent of digitalisation thereof)
	Self – provisioning & external interface	Leverage modern architectures (APIs, cloud etc.)
		Interoperable technology platforms enable new/highly customisable solutions configured by end-users,
		Extent of automation for engaging external factors
		Self – provisioning, externalisation and scalability of core processes
	Automation; algorithms for decision making	Data-driven business
		Use of data and analytics in decision making
	Continuous optimization	Standardising vs./and empowering
		Flexibility /agility of processes
		Bring processes to an industrialised standard
		Operations excellence

Factors	Indicators	Measures, elaboration
IT excellence	IT performance	IT delivery, efficiency and agility
	IT alignment	Quality of IT – business relationship
		"Our IT investment is seen as operational vs. strategic"
		IT-business alignment, and business adoption of IT
	IT digital readiness	Integrated architecture
		IT – expertise
		Effective digital platform
		ICT, IT architecture/systems and new digitisation-based IT systems
		Digital data processing capabilities
		"We routinely use SMAC technologies as well as a strategic set of next-generation enablers (such as the IoT and intelligent automation) for our digital business applications".
		Digital-ready infrastructure

Factors	Indicators	Measures, elaboration
IT excellence	IT agility	Agile project management
		Dual-speed IT
		Agility –ready infrastructure
	IT security	IT security
		IP protection
		IT security, digital security, IT compliance within organisation and towards stakeholders
		Optimisation value-chain network for compliance; avoid unauthorised access
Results	Digital initiatives generating value directly	Digital initiatives are generating value
		10 X improvements in results in targeted areas
	Legacy business expanding	Business segment extension
		Business models expanding
	Functional/process improvements	We have realised limited or no results to date vs. We have already realized incremental benefits (1X) vs. We have already realized transformational benefits (10X)”

Source: Armstrong and Lee (2021) P. 623

APPENDIX B: PARTICIPANT INFORMATION SHEET

Good day Sir/Madam

Request for your time to participate in the research study

My name is **Emanuel Mmuelli Mosia** and I am studying for a Masters in Management: Digital Business in the Business School at the University of the Witwatersrand. In fulfilment of my master's degree, I am required to conduct a research project.

My research topic is "**Senior Managers' perception of their role in facilitating digital transformation in the public sector – South Africa"** under the supervision of **Prof. Leona Craffert.**

As part of this study, I would like to invite you to participate in a face-to-face /virtual interview. This activity will involve semi-structured questions regarding your in-depth knowledge and experience in your role in facilitation of digital transformation within your unit. The interview will be conducted at the convenience of your time and location, it will take 30 to 45 minutes. With your permission, I would also like to record the interview using digital device.

There will be no personal costs to you if you participate in this project. You will not receive any direct benefits from the participation, but there are no disadvantages or penalties if you do not wish to participate or withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential and anonymity is assured depending on your preference. The final report will not make use of your name or any identifying information. The pseudonym (false name) will be used to represent your participation in my final research report. The information you provide will be held securely and not disclosed to anyone else. If you experience any distress or discomfort at any point in this process, we will stop the interview or resume another time.

If you have any questions during or afterwards about this research, please contact me on the details listed below. This study will be written up as a research report available online through the university library website. The data collected from this study will be stored in secure cloud – based storage and kept for six months. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical),

telephone: (+27) 11 717 1408, email:hrec-medical.researchoffice@wits.ac.za

If you agree to the request, please respond in writing to the given email.

Yours sincerely,
Emanuel Mmuelli Mosia

Contacts: 072 484 7864
Email: 2509732@students.wits.ac.za

Supervisor: Prof. Leona Craffert
Email: Leona.craffert@wits.ac.za

APPENDIX C: PARTICIPANT AGREEMENT FORM

Consent Form

Title of project: Senior Managers' perception of their role in facilitating digital transformation in the public sector – South Africa

Name of researcher: Emanuel Mmuelli Mosia

I, …… agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below).

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

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

I agree that the interview may be audio/Video recorded. **YES NO**

I agree that direct quotations from my interview may be used by the researcher in their research report. **YES NO**

I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report). **YES NO**

I agree that other researchers may use the information I provide in my interview (depending on their ethics clearance being obtained) but my name and any personal information will not be used or passed on. **YES NO**

…… (Name of participant)

……. (Signature)

…….. (Date)

…….. (Name of researcher/person seeking consent)

…….. (Signature)

…… (Date)

APPENDIX D: PERMISSION LETTER FROM THE ORGANISATION

APPENDIX D: PERMISSION LETTER FROM THE ORGANISATION

agriculture, land reform & rural development

Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

OFFICE OF CHIEF INFORMATION OFFICER. PRIVATE BAG X 833, 184 JEFF MASEMOLA STREET, PRETORIA. 0001. TEL: 012 312 8911

Mr. Emanuel Mmuelli Mosia
University of the Witwatersrand
Wits Business School
Email address: 2509732@students.wits.ac.za

Dear Mr. Mosia

SUBJECT: PERMISSION TO CONDUCT RESEARCH AT THE DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT FOR DISSERTATION

Your letter dated June 13, 2022 bears reference.

After careful consideration your request to conduct research on the topic: **Senior Manager's perception of their role in facilitating digital transformation in the public sector in South Africa** is granted. This approval is in the context of value addition to DALRRD's digital transformation and therefore, the final outcome of your research must be shared with DALRRD and especially the oCIO.

It is acknowledged that the targeted population will be Directors (SL – 13), Chief Directors (SL – 14), Deputy Director General (SL – 15) and with time permitting, may also include the Director General (SL – 16). While you indicated that your chosen method of data collection is interviews (face to face or virtual), it is cautioned that this must not interfere with the day to day operations of the Department. In other words, the duties and responsibilities of DALRRD take preference.

Yours truly,

MS. P.T SEHOOLE
CHIEF INFORMATION OFFICER
DATE: 27/03/2023

Department of Agriculture, Land Reform and Rural Development. Departement van Landbou, Grondhervorming en Landelike Ontwikkeling. Muhasho wa zwa Vhulimi, Mbuedzedzo ya Mavuna Mveledziso ya Mahayani. uMnyango Wezolimo, Izinguzuko Kwezomhlaba Nokuthuthukiswa Kwezindawo Tasemakhaya. Ndzawulo ya Vurimi, Antswisowa Misava na Nhluvukiso wa Matikoxikaya. Litiko Letekulima, Tinguzuko Kutemiliaba Nekuthutfukiswa kwetindzawo Tasemaphandleni. UmNyango wezoKuLima, ukuBuyiselwa kweNarha noKuThuthukiswa kweHlabelo zemaKhaya. Kgoro ya Temo, Peakanyoleswa ya Nagale Tlhabollo ya Dinagamagae. Lefapha la Temothuo, Kabobotjha ya Nshale Tlhabollo ya Dibaka tsa Mahae. Lefapha la Temollhuo, Pusetsodinaga le Tlhabololo ya Metsenagae. ISebe lezoLimo, uBuyekezo lwemiHlab - noPhuthliso lamaPhandle

APPENDIX E: ETHICS CLEARANCE CERTIFICATE

APPENDIX E: ETHICS CLEARANCE CERTIFICATE

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/DB2509732/147
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

Project title	Senior managers' perception of their role in facilitating digital transformation in the public sector in South Africa
Investigator / Researcher	Mr Emanuel Mmuelli Mosia
Nature of Project	MM (Digital Business)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2023-01-18
Expiry date	Date of submission of the project / research report
Chairperson	Prof Anthony Stacey ☎ +27 11 717 3587 +27 82 880 4531 ✉ anthony.stacey@wits.ac.za

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

19/01/2023
Date:

APPENDIX F: INTERVIEW INSTRUMENT

1. Opening

A. **Establish Rapport**: a full introduction of who I am and the institution under which I am conducting the research study

B. **Clearly state the purpose**: The interview aims to gather perspectives from Senior Managers on their perceptions of their role in facilitating digital transformation in their workplace, based on their knowledge and experiences. The information will be used generate theory and gain knowledge about digital transformation in the public service.

C. **Time**: The interview should take us about 30 to 45 minutes. Clarify issues of ethics and confirm whether the participant is still available to answer the questions.

2. General demographic question

2.1. Where do you fall within the following age brackets: 40 – 45; 46 – 50; 51 – 55; 56 – 60 and 61- 65?

2.2. Gender (Just tick ✓)

2.3. How long have you been in the agricultural sector/industry?

2.4. How long have you been working in the department?

2.5. What are your qualifications?

3. Body

3.1. What do you understand the study to be all about?

3.2. What is your understanding/perception of the impact of technological developments on the agricultural sector? Please explain/elaborate

3.3. What is your understanding of digital transformation?

3.4. Armstrong and Lee (2021) defined digital transformation as the sum total of all organisational change efforts in response to technological disruption that result in a marked change in the form and nature of the organisation, especially so that the organisation's ability to thrive in the digital age is improved. Any comments?

- What do you think is Senior Managers' understanding of digital transformation within the context of the work environment?

- Do you think that there is alignment in Senior Managers' understanding of digital transformation?

3.5. Research (Checinski et al., 2019) indicates that the public sector transformation efforts failure rate is higher at 80% compared to private sector at 74%.

- What do you think could be reason(s) for public sector high failure rate?

3.6. What do you think should the role of Senior Manager be in terms of digital transformation journey within the department?

- (Westerman et al., 2014) argues that senior leaders, need to create the appropriate momentum around digital transformation. Is this what is happening in this department? **Please elaborate.**

- How would you describe the role you play in digital transformation of your unit? **Please elaborate**

- What were the changes or impact that occurred as a result?

- Do you think leadership has a role to play in ensuring alignment between ICT strategy and organisational strategy? **Please elaborate.**

3.7. According to the study by OECD (2012) Innovation in the public sector refers to significant improvements to public administration and/or service.

- What is your view on innovation in the public sector (your work) environment?
- What is your understanding of the relevance of innovation in the digital transformation journey of the organisation? **Please elaborate.**
- In your view, what improvements or innovations were implemented in this department towards improvement of processes, services delivery for the benefit of all stakeholders (e.g., staff, organisation, citizens etc.)?

3.8. Armstrong and Lee (2021) defined digital maturity as a measure of an organization's ability to achieve desired strategic and operational organizational outcomes in the presence of and embracing, profound technological change.

- On a scale of 1 – 10 (1 - 4 = low, 5 – 7 = Moderate, 8 – 10 = High) how would you judge/evaluate the digital maturity of your work environment? Please explain

3.9. What can be done to improve or support leaders to facilitate DX in their departments/units?

3.10 Is there anything else that you would like to share about your experience?

4. Closing

A. Summarise: You are very involved in advancing the mandate of the department. The nature of the work you are doing is interesting and helpful to South Africans. All the best in your future endeavours.

B Maintain Rapport: I appreciate the time you took for this interview. Is there anything else you think would be helpful for me to know?

C. Action to be taken: Would it be acceptable to you to approach you again should I need to clarify something that transpired from this interview?

Thanks again.