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Digital transformation within the public sector communication service in South Africa

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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, 2024

(Final Version 2023/24)

DECLARATION

I, Dalson Nkoana Modiba, 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 to this or any other university.

Name: Dalson Nkoana Modiba Signature:

Signed at Johannesburg

On the …..… of ……2024

ACKNOWLEDGEMENTS

This report would not have been possible without the support of my family, friends, classmates, lecturers, and colleagues.

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To my employer: this is my small contribution towards an even greater contribution you have made in my life and that of my family. I am grateful too, for being able to utilise your infrastructure and human capital to make this research project a success.

To my family: To my wife, Thembi, and our children: thank you for allowing me to deprive you and the children of some of the luxuries that life has to offer so that I could fulfil my long-held dream of furthering my studies, especially after the difficult moments we went through together in the recent past.

God said, "Let there be light, and there was light." I am truly grateful for the gift of life from God the Almighty.

ABSTRACT

Neo-institutional theory (NIT) has been widely used in research concerning business, accounting, economics, management studies, health, education, political science, and sociology. The use of NIT, especially in the area of digital transformation (DT), is still in its embryonic stage. Furthermore, despite the benefits of DT, documented case studies about the successful implementation of DT initiatives are scant, especially in the public sector. In this study, NIT was utilised to examine the role of digital transformational leadership (DTL) and organizational agility (OA) in accelerating DT in a South African (SA) public sector communication service. Using a pre-tested survey instrument, the aim was to collect and evaluate additional quantitative data to answer the question: is NIT an appropriate model to use to assess DTL, OA, and DT relationships in a public service communication service within a South African context? The findings affirm that, in the South African context, there is indeed a linear relationship between DT and DTL, with DTL and OA as predictors. Both factors are significant predictors of DT, with the results accentuating the crucial role of DTL in the interplay of OA and DT. DTL was found to have a positive and significant effect on OA. OA was found to have a complementary mediating role in the relationship between DTL and DT. Consequently, this study provides crucial insights, especially for practitioners who are looking to explore and invest in the leadership traits required to build agile public service organizations to successfully implement DT initiatives. It also opens up avenues for further research, especially considering the fact that DT remains a complex digital dilemma even after several studies that have been conducted.

KEY WORDS

Organizational agility, Digital transformational leadership, South Africa, New institutional theory, Public Sector Communication, Digital transformation, PLS-SEM

ABBREVIATIONS AND ACRONYMS

ABBREVIATIONS	DESCRIPTION
ABCDE Framework	"Antecedents (A), Barriers and Challenges (BC), Drivers (D), and Effects (E)"
AI	Artificial Intelligence
AGV	Automated Guided Vehicles
ANOVA	Analysis of Variance
AVR	Augmented and Virtual Reality
DT	Digital Transformation
DTL	Digital Transformational Leadership
F	Frequency
FinTech	Financial Technology
IBM	International Business Machines Corporation
ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
ITOT	IT-enabled Organizational Transformation
N	A sample size of number of participants in a study
NIT	Neo Institutional/Organizational Theory
OA	Organizational Agility
p	Significance
PLS-SEM	Partial least squares structural equation modelling
R	Coefficient of determination
RFID	Radio Frequency Identification
RPA	Robotic Process Automation
r2	Correlation coefficient
SD	Standard deviation
Sig	Significance
SPSS	Statistical Package for the Social Sciences
VIF	Variance Inflation Factor
Wits	University of the Witwatersrand
4IR	Fourth Industrial Revolution or Industry 4.0

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CHAPTER 1. INTRODUCTION

Bricks and mortar organizations are aiming to transform into digital establishments, during this post-industrial and information age era, to adapt to the inescapable changes resulting from Industry 4.0 (Sony & Naik, 2020). Industry 4.0 is a digital transformation (DT) of commercial and public sector organizations to provide real-time decision-making, increased productivity, flexibility, and agility (Alghamdi & Agag, 2023; Ghobakhloo, 2020). This digital change manifests itself in how organizations conceptualize, conceive, enhance, and disseminate their products and services, leveraging the power of innovative digital technologies within operating facilities. It is characterized by digital technologies such as robotic process automation (RPA), artificial intelligence (AI), machine learning, Internet of Things (IOT), data analytics, block chain, mobile and cloud computing, big data, and analytics (Durão et al., 2019). For example, RPA involves automating repetitive and manual tasks that are time-consuming and labour-intensive in order to bring about efficiencies in value-chain processes. Whereas AI involves the programming of machines and computers in order to logically think, perform and learn in similar ways as humans. AI-enabled machines and computers are able to perform both logical and physical activities that humans would normally perform. IOT refers to physical objects, such as motor vehicles and computer equipment that are fitted with sensors and application software to communicate with each other and share information within a cloud computing environment.

Therefore, DT implies radical institutional or organizational change, often brought about by rapid and disruptive exogenous digital factors, aimed at improving an organization's strategic posture, structures, processes, and products and services in the face of new digital technologies towards the fulfilment of the customer's needs (Ly, 2023). Figure 1 provides a simplified representation of Industry 4.0.



Figure 1. Simplified representation of Industry 4.0 (Mavidis & Folinas, 2022)

In the era of Industry 4.0, organizations across all industries are increasingly looking at ways that digital technologies could assist in effectively and conveniently tackling some of their vexing customer pain points. The real benefits of innovative technologies come from the scale and exponential network effects of the actors on the supply and demand sides of the digital platforms, reducing the cost of transacting (Fitriani et al., 2023; Vidal, 2023). In recent years, we have seen DT technologies transforming value chains across all industries and economic sectors Ferraris et al. (2020) and the implementation of DT initiatives has had a positive effect on the lives of individuals and communities, including state institutions, commerce, the mainstream media, the arts and sciences, and the medical fraternity (Ly, 2023).

In the context of smart manufacturing, manufacturing plants, equipment, and motor vehicles are fitted with smart sensors, application software, and RPAs that collate and analyse big data to illuminate insights that contribute to sound decision-making and improved turn-around times in delivering products and services (Bellantuono et al., 2021; Namjoshi & Rawat, 2022). Consequently, digitally streamlined and integrated value chains enable key

decision-makers with an end-to-end view of business activities to speedily resolve bottlenecks, especially in the public communication service environment characterized by the constant battle against misinformation and disinformation (Ade Irma Stefi Ulil, 2021; John et al., 2022).

Equally, organizations start to reap the benefits through data analytics when data from the manufacturing plants is reconciled to procurement, Human Resources (HR), financial, and customer contact points' data (Bansal et al., 2023). With insights emerging from big data analytics, disruptions to business operations are eliminated as demand for repairs and maintenance can be anticipated to reduce supply chain risks (Birkel & Hartman, 2020; Van Mieghem & Boute, 2019). Thus, waste and inefficiencies are reduced or completely eliminated, ensuring a consistent and predictable supply of services and products (Mavidis & Folinas, 2022).

However, the failure rate of DT initiatives is at an all-time high worldwide, with Deloitte (2020) estimating it at 70% and Ramesh and Delen (2021) gauging the figure to be 90%, despite some $1.3 trillion spent annually on DT initiatives (Ramesh & Delen, 2021). Ferraris et al. (2020) cite operational capabilities, budgets, quality data, information technology resources, and uncontrollable externalised factors as contributing to the roll-out of DT (Huarng et al., 2021). This is also partly because there is some pressure for hasty adoption as new innovative solutions enter the market, with some organizations investing on a large scale in these transformative technologies (Kraus et al., 2022; MacGrath & McManus, 2020). The shift towards digital business should be systematically managed because hasty decisions might result in massive cost-cutting measures that include resizing or reorganization, resulting in job losses and a DT trust deficit (Siebel, 2019).

The lack of integrated and coherent digital strategies and plans are key factors that contribute to DT failures (Huarng et al., 2021). In addition, the top leadership needs to reconfigure organizations for the digital change to be realised. This could be achieved through building the requisite agile organizations and digitally perceptive mentalities (Frankowska & Rzeczycki 202; Vial, 2019; Wong & van Gils, 2022). The growing dichotomy between abstraction and practice contributes to the gap that persists between strategy

formulation and implementation (Li, 2020). For example, a literature review on change management found that 70% of transformation initiatives failed to meet their objectives, largely due to insufficient support from top management, no clearly articulated goals and objectives, and miscommunication between key stakeholders (Bellantuono et al., 2021). Organizations faced with these multiple dilemmas are likely to approach DT from the perspective of a mechanistic worldview, which is reductionist or analytical, instead of adopting a systems thinking approach (Boateng & Olexová, 2023; McCarthy et al., 2023).

Another reason for the failure rate of many DT initiatives is the chief digital officer not being appointed to drive the development and implementation of digital strategies and not working in tandem with the chief information technology officer (Firk et al., 2021; Huarng et al., 2021; Schachtner, 2023). For DT to succeed, it is crucial that top leadership possess or acquire the requisite digital competencies necessary to reconfigure the organizations to be agile and responsive to meet the demands of the digital economy (Kwakernaak, 2019; Yadav et al., 2023; Zhu et al., 2022). Notably, DT is an exogenous factor imposed on organizations, requiring digital transformation leadership (DTL) to reconfigure the organizations to respond to disruptive and innovative technologies to thrive and survive. Thus, the diffusion of digital innovations means existing institutional arrangements such as governance structures, role-players, norms, and standards, including ingrained habits, should be modified, challenged, or disintermediated to embrace the new rules of engagement in the digital era (Höyng & Lau, 2023; Ford et al., 2021).

It is the role of the DTL to guide an organization through DT. DTL can articulate a clear vision for the future, build consensus centred on digital culture, and empower employees to embrace Industry 4.0 change (Akkaya & Tabak 2020; Musaigwa & Kalitanyi, 2023). They are also able to navigate the complex political and economic landscape of DT to steer organizations into the desired future (Oliva et al., 2019).

DT initiatives can succeed when there are critical enablers such as making provision for critical funding and DTL support and transparent and collective learning among ecosystem players. Furthermore, promoting digital preparedness and advancing a digital learning culture, creating digital innovation hubs, documenting and promoting success, and learning

from failures, as well as building digital skills through training and development, are also crucial (Asthana & Prime, 2023; Batuk ÜNlÜ & ÇAliŞKan, 2022).

On the positive side, DT can involve changes to, for example, a public sector organization's service offering, its business processes, its organizational structure, and its culture. A DTL can bring about DT initiatives that are both innovative and strategic, accelerating the adoption of digital technologies by leveraging key resources and dynamic capabilities to improve business performance by accentuating customer-centric value creation and reducing inefficiencies (Gong & Ribiere, 2021). This can be achieved by drawing on the strength of collaborative networks established with varying key stakeholders (Edvardsson & Tronvoll, 2022). Additionally, where feasible, through coopetition (where competing companies or organizations work together to achieve their strategic goals) efforts (Guo et al., 2023). DT initiatives in organizations are orchestrated by digitally perceptive leadership by means of a process such as the one outlined in figure 2 below.

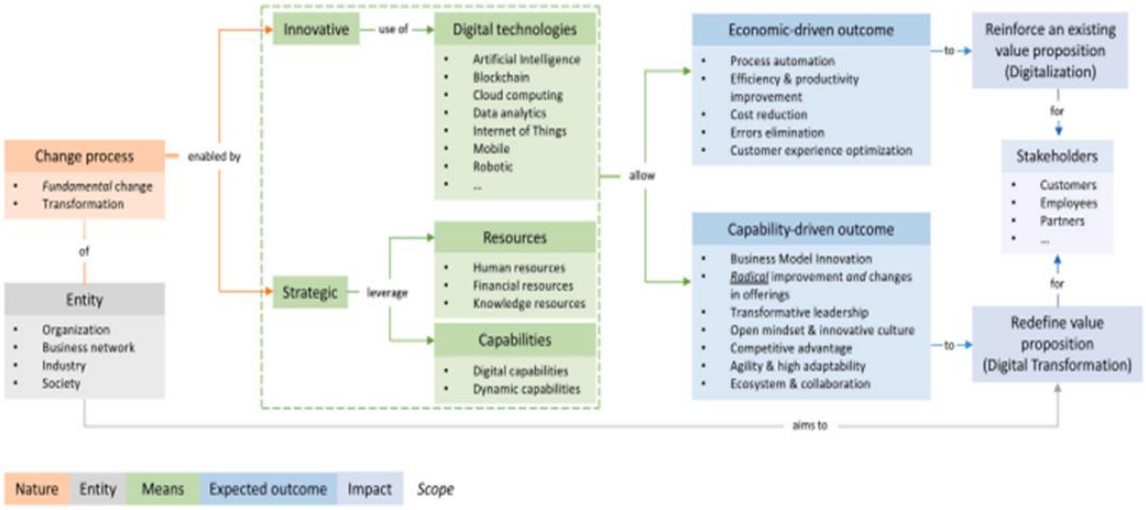

Figure 2. Organizational diffusion of digital transformation (Gong & Ribiere, 2021)

Therefore, DT is about fundamentally implementing new best practices that help improve the organization's performance in order to outperform rivals and to thrive and survive. At the heart of this radical and often complex change is the advent and introduction of novel and disruptive technologies within work practices. The processing speed often witnessed in manufacturing and by food retailers would not be possible without the impact of these

transformative technologies. As stated above, some changes are necessitated by coercive forces, such as the rapidly changing demands of customers. For organizations to succeed in realising their ultimate goals, be they to make profit or offer excellent services, they require leaders who are digitally perceptive. They also require leaders who can decipher the implication of the ever-changing market forces to prepare their organizations to adapt to the change and exploit opportunities to thrive and survive.

The use of innovative technologies is not limited to commercial enterprises; public sector organizations also stand to benefit immensely when adoption is accelerated, resulting in many clients being served. Such an organization is the focus of this study.

1.1 PURPOSE OF THE STUDY

This study was limited to an investigation of DT within the public sector communication service in South Africa, namely the Government Communication and Information System (GCIS), utilizing a research instrument and a conceptual framework developed and tested in Cambodia to investigate the role of DTL and OA on DT using the NIT (Ly, 2023). As the conceptual framework has only been tested in Cambodia, this study provides further opportunity to test the conceptual framework in a different country setting. By so doing, this enhances the use of this framework as a blueprint for research studies on DT and for use-case scenarios.

The choice of South Africa was informed by the fact that it is the researcher's home country; thus, the author has a vested interest in contributing to the betterment of the South African public sector communication service.

The reason for focusing on the South African public sector communication service was that successfully implementing the DT initiatives within this service would enable the government to enhance the cost and convenience of accessing essential services and information through improved supply chain management processes (Seepma et al., 2021). These will assist in tackling the vexing systemic challenges of unemployment, inequalities, poverty, poor record-keeping, and the resultant negative audit outcomes attributed to breaches in the procurement processes and value chains (Maluleke, 2023; Pretorius, 2021). Moreover,

GCIS was already undergoing its DT journey and looking to design its own DT strategy. The communication service organization was viewed as an ideal guinea pig for this study due to its vantage point in terms of employees' footprint presence and strategic communication influence across all spheres of government in South Africa.

The NIT essentially states that DT initiatives become successful when DTL (an independent variable) and OA (an independent variable) have a positive influence on DT (a dependent variable). The choice to use this theory was informed by the fact that public sector organizations are rule-based; therefore, institutional changes should be legitimate if the reconfiguration of the existing rules and regulations to foster innovation and digital culture are to succeed. NIT as a sociological theory or framing lens helps us to understand the coercive pressures often brought to bear on organizations by other regulatory public sector organizations as rules and regulations, normative pressures (when public sector institutions subscribe to professional bodies and are bounded by their standards and ethics), and mimicry (when public sector organizations adopts best practices of other public sector or private sector organizations).

Finally, the empirical study was limited to sampling only senior, middle, and junior directors stationed at the head office and provincial offices within the GCIS. No GCIS employees below the level of junior (assistant) director and no employees from other organizations were asked to participate in the study.

1.2 CONTEXT OF THE STUDY

GCIS is the public sector marketing arm of the South African government, tasked with developing a communication policy, a national communication strategic framework, and norms and standards for the whole of the government's communication machinery (Government Communication and Information System, 2023).

GCIS is also responsible for strengthening the collaboration and coordination of national, provincial, and local government spheres by ensuring that interdepartmental and inter-governmental communication structures are established and functioning, with coherent messaging on major government programmes and communication campaigns, including

crisis communication (John et al., 2022). With a footprint in cities and districts across all nine provinces in South Africa, GCIS is positioned to provide the strategic communication advice required, whether by national, provincial, or municipal executives and communication structures.

The primary aim of public sector communication organizations is to keep citizens informed about the programmes and policies of the government by making accurate information timely available. Public sector communication service organizations face increasing pressure to set the agenda by being government news breakers. Moreover, public sector communication service organizations should tackle the proliferation of misinformation and disinformation that could threaten the stability of state institutions. Therefore, they must adopt agile methods to compete with digital social media and other platforms (Dühring & Zerfass, 2021). Figure 3 below provides a summary of the five principles underpinning a public communication service in the digital era.

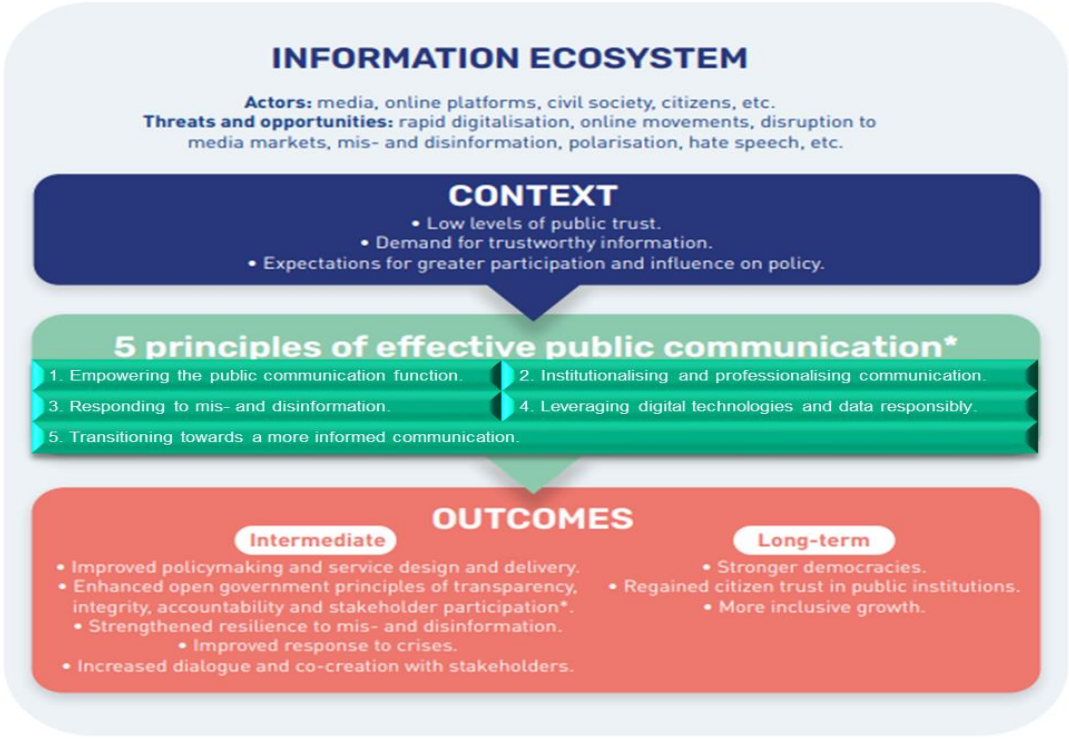

Figure 3. Principles that also inform communication OECD (2021)

The modes of service delivery in the public service include, for example, e-government with the introduction of on-line platforms for services such as the application for identity

documents (IDs) and passports and licence renewals (Pillay, 2012). By utilizing both physical and digital platforms, collaborations between the government and the private sector in areas such as ID and passport applications, in which banks act as intermediaries, have enabled citizens who cannot visit the nearest Home Affairs department to apply and have IDs and passports issued at the banks (Pillay, 2012). In its 2030 National Development Plan, the South African government stated that digital technologies were crucial for building an all-inclusive, thriving economy and an information-connected citizenry (Manda & Backhouse, 2018). DT is pivotal in the government's efforts to realise the goals of NDP 2030. In the context of government DT, a succinct summary of the principles characterizing South Africa's DT pillars is provided in Figure 4 below. Therefore, to succeed, government has to work with multiple stakeholders to embrace DT initiatives, and these collaborations unavoidably introduce a fair degree of digital dilemmas; hence the need for leaders who possess the requisite skills to navigate the treacherous path towards successful implementation of DT (Hafseld et al., 2022).

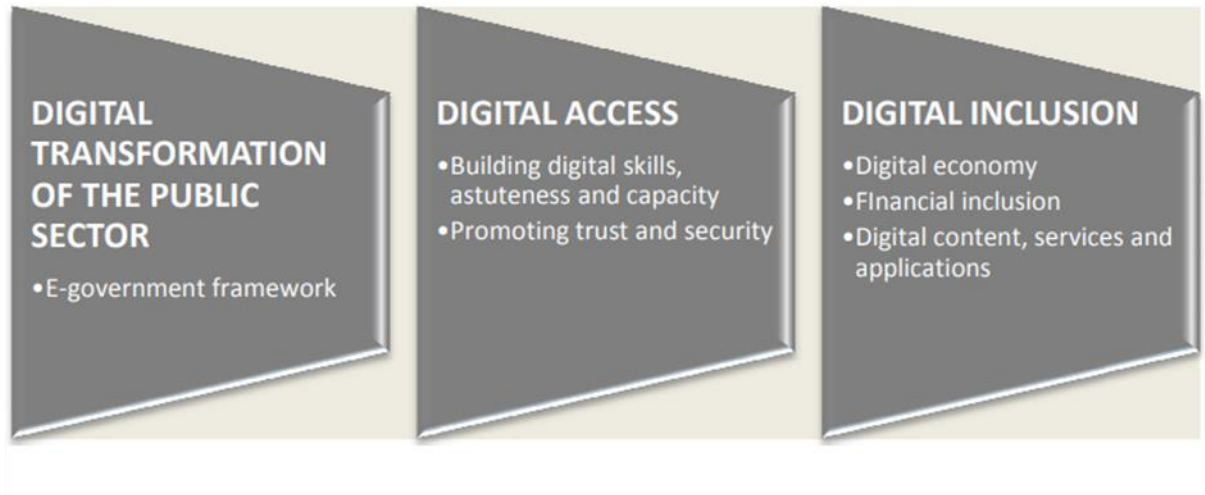

Figure 4: South Africa's Three Pillars of Digital Transformation (Manda & Backhouse, 2018)

Although the results of DT efforts are encouraging, documented successes are few, hence the need to investigate the factors that are crucial for DT to be institutionalized on a larger scale in the South African public sector. Since the advent of these transformative digital technologies, no other period has seen greater digital technology adoption than the period of the COVID-19 pandemic, when government lockdowns were instituted around the world to contain the spread of COVID-19. During this period, institutions were coerced into

adopting these disruptive technologies with the introduction of hard COVID-19 pandemic lockdowns in order for employees to work remotely. The COVID-19 pandemic of 2020–2021, when the president and cabinet members held press briefings on a regular basis to brief the South African citizens about the mitigating measures taken to contain the pandemic, serves as a reference point (Presidency of South Africa, 2021). The communication platforms used to facilitate interaction between the government and the citizens included print and digital media, television, radio, and social media.

The experience of the use of digital disruptive technologies, especially during the COVID-19 era, means that GCIS serves as a crucial research reference point to assess the progress made post COVID-19, for the public sector to accelerate the implementation of DT initiatives. The issue that arises is whether the adoption trends are continuing beyond the COVID-19 lockdown or whether organizations have reverted to their previous business practices.

What we do know is that, in South Africa, there is a growing dissonance between private sector and public sector organizations, which can be attributed to the declining government performance and growing inequalities (Manda, 2022). Moreover, public sector organizations are beset by ageing digital information technology infrastructure (Pattij et al., 2020). Efforts to migrate to new digital technologies from legacy systems are hampered by poor project management, resulting in overspending and delayed implementation (Mergel, 2016).

Thus, the DT failure rate can be attributed to poor DTL and institutional arrangements such as weak administration and governance, a disengaged workforce, poor adaptation to externalised factors, and an inability to translate plans into tangible outputs because organizations have not been reconfigured for the digital age (Syed et al., 2023). Hence, public sector communication service organizations should continue to push for digital reforms that accelerate service delivery in order to address the declining public trust in government institutions and their leaders (Günal & Mülazımoğlu, 2023; Mahmood, 2016; OECD, 2022).

1.2.1 PRELIMINARY LITERATURE REVIEW

The above causes of high DT failure rate in other parts of the world have prompted researchers and practitioners to investigate the contributing factors with a view to identifying possible solutions. Several researchers have explored mechanisms that accelerate the implementation of DT in public and private sector organizations. It has been established that DT in the public sector relies heavily on coherent planning, implementation, monitoring, and regular assessment of progress against predetermined success indicators in order to mitigate against wasteful expenditure, a poor success rate, potential reorganization, and large-scale retrenchments of employees (AlNuaimi et al., 2022; Li, 2022; MacGrath & McManus, 2020; Siebel, 2019). Moreover, the DT journey should not be conflated with classic strategic management processes that result in corporate and business strategies. Instead, DT should be the bedrock of both corporate and business strategy in order for digital leaders to foster the necessary innovation and digital culture, as illustrated in Figure 5 below (Armstrong & Lee, 2022). Therefore, DT should be infused into the business and functional strategies, processes, practices, operating models, IT strategies and the drafting of a digital strategy.

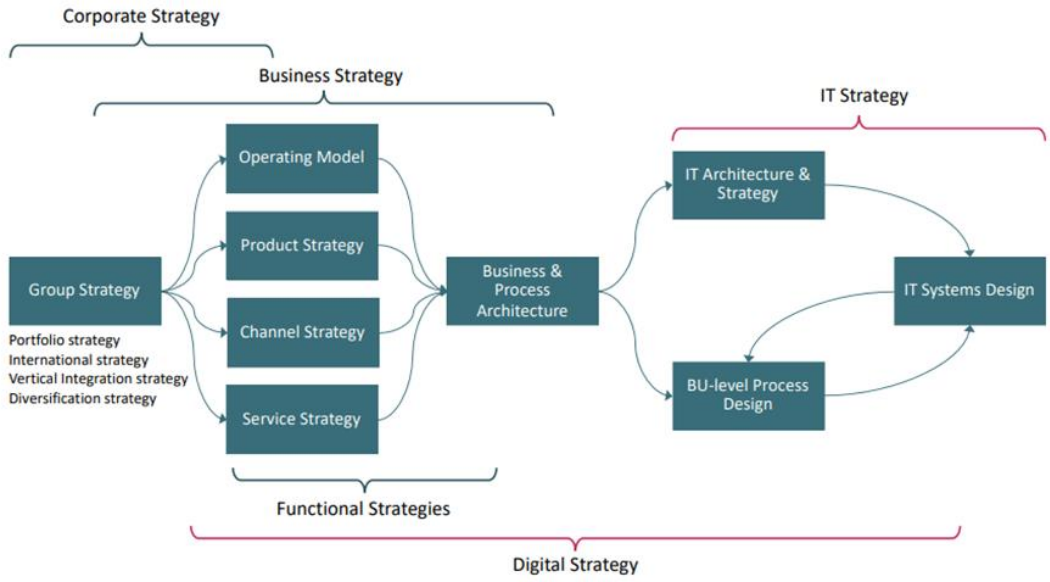

Figure 5. Scope of different layers of strategy (Armstrong & Lee, 2022)

Additionally, organizations should develop digital capabilities such as a digital culture, DTL, digital competencies, and dynamic organizational capabilities (Scuotto et al., 2022). Furthermore, technical skills, policy development skills, leadership skills, innovation skills, and change management skills are the most required skills to implement DT initiatives. Moreover, collaboration skills, creative thinking skills, people management skills, research skills, and strategic project management skills are required by leaders to survive in Industry 4.0 (Maponya & Naidoo, 2023; Menon & Suresh, 2021; Walsh, 1995). Organizations can harness digital capabilities by promoting an agile digital innovation culture (Höyng & Lau, 2023). Figure 6 summarises how DTL can foster an agile culture.

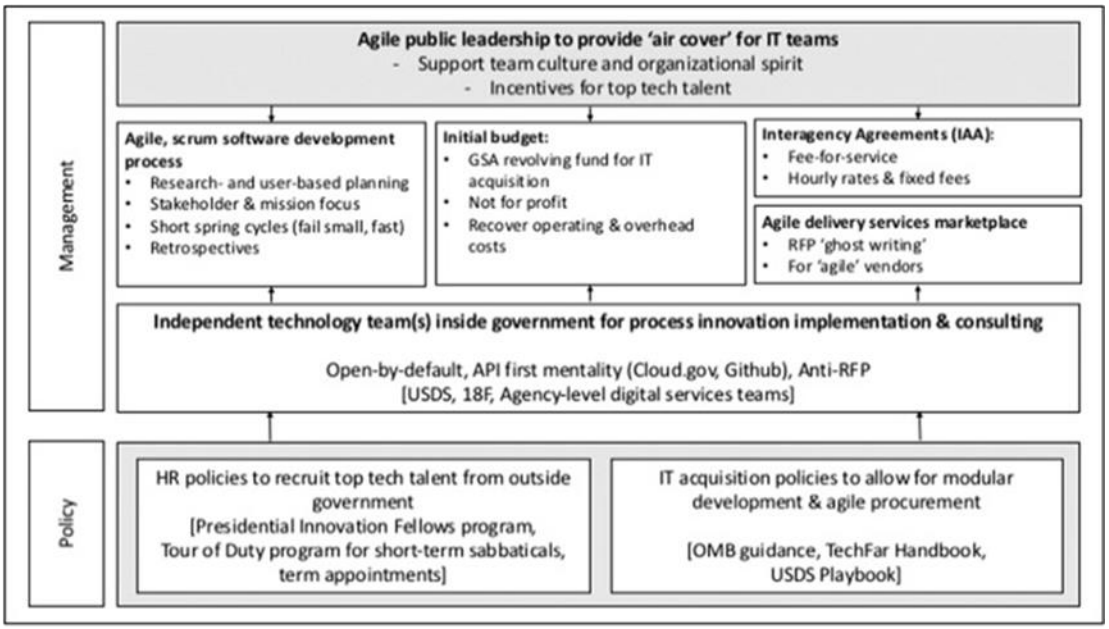

Figure 6. Agile innovation management building blocks (Mergel, 2016)

However, few studies have been conducted on the role of DTL and OA, using the neo-institutional (or organizational) theory (NIT) as a framing lens, which helps to accelerate the adoption of DT initiatives. The institutional (or organizational) theory is an examination of organizations focusing on the impact of bounding factors due to both documented and undocumented rules that affect individual actors and groups' behaviour within an organization. In a nutshell, it emphasises that individuals and groups are not merely rational actors but are a reflection of rules developed, canvassed, and agreed to, and therefore legitimised and institutionalized; hence, its emphasis on the social-cultural method of

organising. However, this study is premised on the NIT, which is a branch of institutional theory. Unlike its forebear, which focused only on bounding factors, the NIT focuses on both bounding and enabling factors. Thus, NIT goes beyond merely advocating for organizations to operate within the rules and regulations to gain legitimacy. Through the isomorphic pressures that characterize the NIT, organizations are rewarded not for merely complying but also for organizing the institutions in ways that ensure economical, effective, and efficient use of input costs in the furtherance and fulfilment of the needs of the public. In summary, institutions can gain legitimacy not only by following prescripts imposed by powerful "political" individuals or government departments, but also by adopting related industry standards or by applying best practices from similar institutions and therefore coming to resemble the perceived external institutional best practices.

In fact, only two recent studies have illuminated crucial factors affecting DT acceleration using NIT as a framing lens to assess the acceleration of implementing DT in the Arab Emirates and Cambodia, namely AlNuaimi et al. (2022) and Ly (2023). For example, in a study using NIT as a lens to establish the influence of DTL and OA on DT, with digital strategy as a mediating factor, AlNuaimi et al. (2022) found that DTL and OA positively influenced DT. Furthermore, the authors found that DTL positively influenced OA and that OA was found to positively mediate the relationship between DTL and DT. The authors did not find that digital strategy moderates the relationship between DTL and OA on DT. In another study by Ly (2023), using the NIT as a framing lens, the author sought to establish the influence of DTL on DT through OA and whether OA mediated the relationship between DTL and DT. He found that DTL had a positive impact on DT through OA and that OA mediated the relationship between DTL and DT.

Apart from these two seminal studies, which made an invaluable contribution, studies on the role of endogenous factors in enabling the acceleration of DT using institutional and neo-institutional theories remain scant.

Notably, both AlNuaimi et al. (2022) and Ly (2023) called for more studies in other countries to further test the efficacy of the two models they had developed. These authors were adding their voices to similar calls made by Mergel et al. (2018) and Agostino et al. (2021) for more

studies to investigate the use of DT in the reconfiguration of public sector organizations to improve the delivery of essential public services. Moreover, differences between South Africa and Cambodia, where Ly (2023) conducted his study, for example, might lead to different research results and observations.

1.3 RESEARCH PROBLEM

Despite DT being the least understood and complex phenomenon that impacts various business ecosystems and individuals, insufficient research has been conducted on appropriate methods to implement innovative and transformative technologies successfully, including reconfiguring organizations for the required agility in order to realise the much-needed digital business value (Verhoef et al., 2021). Studies conducted so far in public sector organizations have focused only on OA and DT in areas such as procurement chains or have been largely qualitative or conceptual (Ferreira et al., 2019; Guarnieri & Gomes, 2019). By exploring dynamic endogenous factors affecting DT, this study tackles the gap and research opportunities identified in the aforementioned studies, especially taking into account country-specific cultural dynamics.

In particular, too few studies have been conducted to test the theoretical and conceptual frameworks developed by AlNuaimi et al. (2022) and Ly (2023) to enable wider acceptance and application by the research and industrial communities. Moreover, Ly (2023) is the only researcher to have utilised NIT to investigate the impact of AO on DT, following the recommendation made by a previous researcher (AlNuaimi et al., 2022; Dubey et al., 2019).

NIT has been widely used in studies relating to accounting Haapamäki (2021); economics Dal Bello et al. (2021); business management studies Damayanthi and Gooneratne (2017), Fitriani et al. (2023), and Gamage and Gooneratne (2017); health AlNuaimi et al. (2022); education Kanwar et al. (2019), political Olsen (2009) and sociology (Carvalho et al., 2017; Govers & Van Amelsvoort, 2023). The use of NIT in DT studies is still in an embryonic stage AlNuaimi et al. (2022) and Ly (2023), and Manda and Backhouse (2018), especially within public service organizations, in the post COVID-19 pandemic era.

Where DT studies have been conducted through the NIT lens, they were generic in nature and did not delve into the crucial factors that accelerate DT initiatives, especially within the public sector context (AlNuaimi et al., 2022; Ly, 2023). Finally, there were no similar studies found in a South African context that utilized NT to investigate the impact of DTL and OA on DT.

1.4 RESEARCH OBJECTIVES

The main objective of this study was to investigate and establish empirically whether DTL and OA play a significant role in the successful implementation of DT initiatives within the public sector communication service.

Firstly, the main objective was achieved by attaining the sub-objectives set out below:
a) Sub-objective 1: To determine the influence of DTL on DT in the GCIS.
b) Sub-objective 2: To determine the influence of OA on DT in the GCIS.
c) Sub-objective 3a: To determine the influence of DTL on OA in the GCIS.
d) Sub-objective 3b: To determine whether OA is a mediating factor in the relationship between DTL and DT in the GCIS.

Secondly, flowing from the above sub-objectives, the following research questions were formulated and were answered:
a) Sub-question 1: Does DTL positively influence DT?
b) Sub-question 2: Does OA positively influence DT?
c) Sub-question 3a: Does DTL positively influence OA?
d) Sub-question 3b: Is OA a mediating factor in the relationship between DTL and DT?

By formulating the above sub-objectives and answering the above research questions in response to the key research objectives, this study enriches the existing yet limited literature on the use of NIT to reconfigure organizational structures and cultural change, including documented policies and procedures, common practices, and the formation of new types of organization for the acceleration of DT (Meyer & Rowan, 1977).

1.5 SIGNIFICANCE OF THE STUDY

This study builds on the existing yet limited knowledge generated on the use of NIT to investigate the role of DTL and OA on DT in public sector organizations, particularly within the public sector communication service.

Consequently, it has a significant contribution to make in that:

(i) It contributes to the body of extant literature on the use of NIT to accelerate DT.

(ii) It also shares insights with digital business managers and other practitioners by re-affirming the importance and urgency of deinstitutionalizing existing organizational practices that impede innovative digital change and methods, so that the institutionalization of the much-needed digital practices to accelerate DT initiatives is effected for the public sector and other institutions in order for them to survive and thrive.

1.6 DELIMITATIONS OF THE STUDY

This study is limited to one government department in South Africa. The study has scoped in only senior, middle, and junior directors stationed at the head office and provincial offices within a South African public sector organization.

The study has not scoped in employees in GGIS below the level of junior (assistant) director. It has also not been scoped for senior, middle, and junior directors, as well as lower-level staff in other public sector organizations in South Africa.

1.7 DEFINITIONS OF TERMS

Table 1: Definition of terms

Concept	Definition
Organizational Agility (AO)	"Agility is the capability of an organization to respond to and take advantage of the changes initiated by the drivers in the internal and external environment. It includes the ability to identify relevant changes and to respond proactively, efficiently, and effectively, employing the right personnel based on competence, not hierarchical status. Additionally, it includes the ability to implement flexible structures and processes suited to the immediate tasks at hand and to employ the appropriate resources in the shortest possible time." (Dühring & Zerfass, 2021)
DTL	"Leaders with DT mindsets, also known as 'digital leaders', can build collaborative networked organizations and find digital competencies." (Bresciani et al., 2021)
Digital Public Communication/Marketing	"In the specific case of digitalization, we see that social networks such as Facebook or Twitter [now X] allow for the emergence of virtual communities, formed around digital practices." (Esse, 2022)
Digital Transformation	"Digital transformation can be described as an organizational shift to big data, analytics, the cloud, mobile communication technologies, and social media platforms to provide goods and services." (Nasiri et al., 2020)

Concept	Definition
Neo/New Institutional Theory (NIT)	“Neo-institutionalism recognizes that public organizations operate under unique circumstances, where ambiguity surrounds inputs and outputs, making it challenging for alternative theories to explain changes effectively. By emphasizing how organizations adapt to institutional pressures in the pursuit of legitimacy, this framework offers a nuanced view of organizational transformation.” (Hwang, 2023)
PLS-SEM (Partial least squares based structural equation modelling)	“Aims at maximizing the endogenous latent variables’ explained variance by estimating partial model relationships in an iterative sequence of ordinary least squares regressions.” (Hair et al., 2021, p23)
Public Communication/Marketing	“The formal communication which tends to exchange and share information of public interest, as well as to maintain social ties and for which the responsibility lies with public institutions or organizations with missions of collective interest.” (Esse, 2022)

1.8 PROPOSED STUDY OUTLINE

Table 1 contains the outline of the dissertation.

Table 2. Proposed Study Outline

Item	Title	Description
Chapter 1	Overview	Introduction to the study, including an outline of the scope and rationale for the study, context, problem statement, objectives and research questions.
Chapter 2	Literature review	Firstly, a comparative review is conducted of studies done in other countries. Secondly, the factors influencing the DT are discussed relative to the following concepts: i. Endogenous factors influencing DT in the South African public sector, as follows: a. NIT and DT b. DT c. The relationship between DTL and DT d. The relationship between OA and DT e. The relationship between leadership and OA in DT f. The mediating role of OA on DTL and DT
Chapter 3	Research methodology	A description of the research methodology used: the research design, research instrument, the sample, criteria, data collection method, approach to data analysis, validity and reliability, and data limitations.
Chapter 4	Results	The research results and findings.

Item	Title	Description
Chapter 5	A discussion of the research findings in relation to the research questions posed.	
Chapter 6	The conclusions drawn from the study and recommendations, especially for public sector institutions, and an indication of the limitations and future research possibilities.	

CHAPTER 2. LITERATURE REVIEW

2.1 INTRODUCTION

This chapter comprises a review of previous studies on the influence of DTL and OA on DT. Hypotheses are formulated on the basis of the findings. A critical literature review was carried out to establish the presence of relevant studies in relation to factors that influence DT. Most of the literature selected for this study was published between 2019 and 2023. The literature review search process unfolded as follows:

1. Journals covering DTL, OA, and DT
2. Journals covering DTL and DT
3. Journals covering OA and DT

The literature review process is summarised in Figure 7 below:

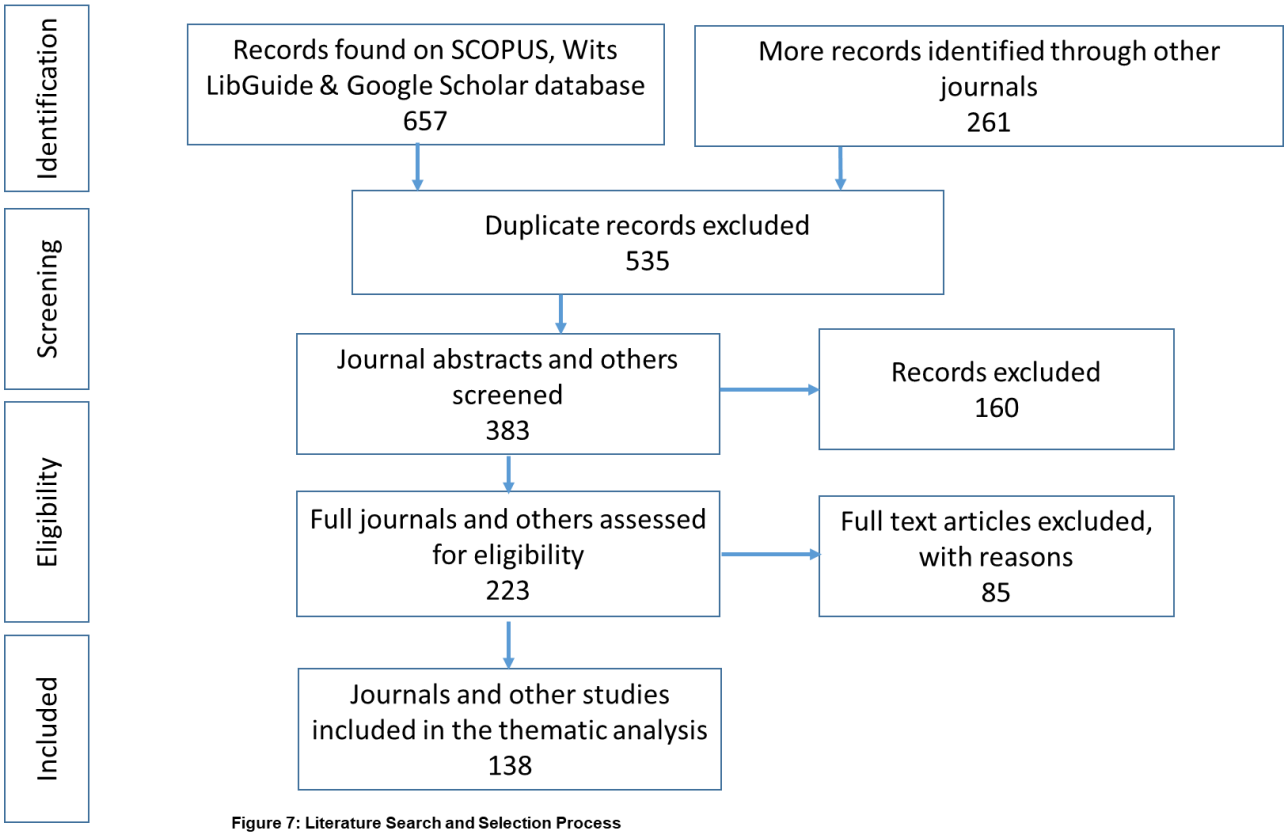

Figure 7: Literature Search and Selection Process

The literature review is undergirded by existing studies on the impact of endogenous factors such as DTL and OA on influencing the orchestration and diffusion of DT in public sector organizations (AlNuaimi et al., 2022; Ly, 2023).

2.2 NEO-INSTITUTIONAL THEORY

NIT is a sociological theory that explains how organizations adapt and change their practices in response to external pressures. In terms of NIT, organizations are not simply made up of rational actors who make decisions based on their own interests. Instead, the prevailing conditions within their operating environments shape them (Hinings et al., 2018). Therefore, it serves as a useful framework in the study of organizational behaviour, especially in public sector organizations Hwang (2023) and, together with a plethora of literary knowledge and empirical studies, it helps one to understand the role of culture and shared practices in organizational studies and change management (Bitektine & Miller, 2015).

Having emerged in the 1980s, according to Vogel (2012), NIT was peripheral in terms of theoretical influence during the 1990s (Alvesson & Spicer, 2019). It slowly gained prominence and became the second-most influential theory in the 2000s. It became the dominant theory in organizational studies since 2010 and beyond. With well over 125 articles published in journals since its inception until 2016, it also became one of the top-cited theories in research journals and studies.

Three situations undergird the NIT (Alvesson & Spicer, 2019):

- Firstly, documented and undocumented political pressure and the dictates of policies and procedures in organizations brought about by coercive pressure, for example, within the South African public sector environment, with the promulgation of the Public Finance Management Act No. 1 of 1999 through the powerful and state-resource-controlling Ministry of Finance in South Africa (Manda, 2022).
- Secondly, mimicry pressure results from attempts to replicate practices adopted by other organizations perceived to be early adopters of good “digital” practices.
- Lastly, the normative pressure arising from adopting industry standards and practices through association with global and regional professional bodies, such as South

Africa's membership in a global professional body called the International Telecommunication Union (Myovella et al., 2021). Figure 8 below synthesises the application of NIT in public sector communication service.

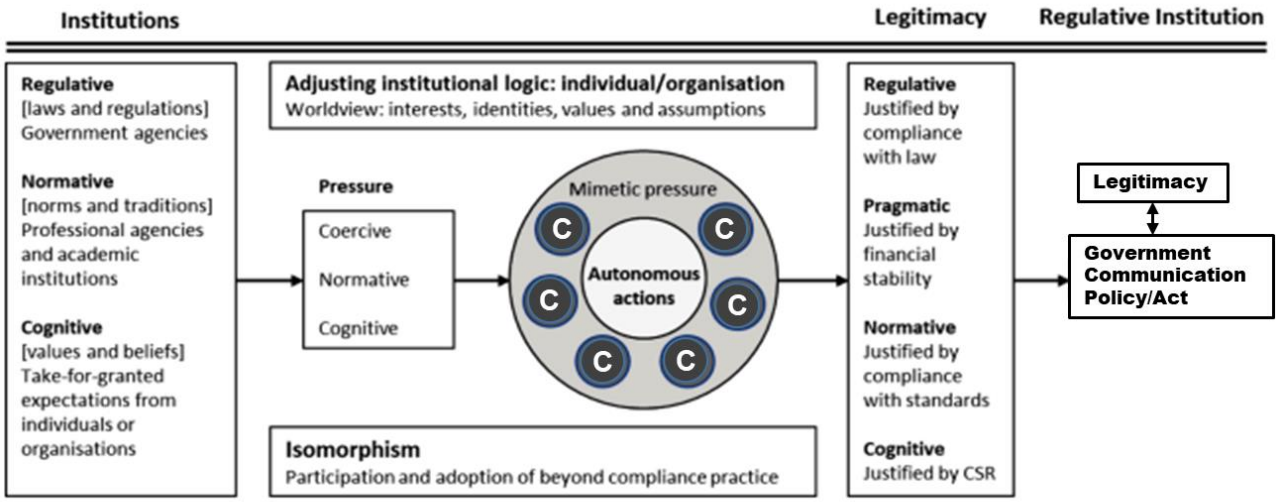

Figure 8. Understanding public sector communication service through the NIT lens. Adapted from (Loi et al., 2021)

NIT has been widely utilized to investigate the impact of introducing new digital technologies into organizations with well documented and habitual practices and cultures due to exogenous coercive pressures and is consequently perceived to be rule-based (Adebanjo et al., 2018; Dubey et al., 2019). NIT enables us to view innovative technological changes through a socio-cultural lens in two ways:

(1) In terms of the relationship between stagnation and transit, perceiving and appreciating progression and similitude, in addition to the need for flexibility and uniformity in organizations (Greenwood et al., 2017).

(2) Understanding that the interplay of stagnation and transit is a product of structures, activities, and actions at societal, field, and organizational levels. Hence, it is necessary to maintain a delicate balance between tradition (old practices) and transformation (embracing change), while ensuring business continuity and embracing novelty. These elements will help an organization thrive and survive during turbulent periods (Haapamäki & Sihvonen, 2019; Scott, 2014; Worley & Beaujolin, 2023).

Therefore, whether the organization stagnates or progresses is a function of the powers and interests that are at play in the public or private sector to institutionalize information and communication technologies and to promote DT (Manda, 2022).

Despite its wide appeal and popularity, NIT has received criticism in some quarters (Lok, 2019). One such criticism comes from Boxenbaum and Rouleau (2011), who state, “A good lens sharpens vision. Given its broad, vague, and abstract character, institutional theory often does not achieve this goal.” They continue that “it is important to avoid the common problem in neo-institutional theory of rapidly and mindlessly moving between metaphors”. Morgan (1980) adds, “Instead, institutional theorists need to focus on a specific root metaphor.”

In support of Morgan (1980), other authors argue, “For instance, institutional theorists might look at institutions as cultural rules” Meyer and Rowan (1977), or “sources of meaning” Scott (2008), “as norm-setters” Barley and Torbert (1997), or “organized procedure” (Lawrence & Suddaby, 2006).

NIT is criticised for its lack of focus by trying to address many factors that affect organizational behaviour. Some authors suggest that, instead of looking at all three elements that influence institutional change, NIT should rather be focused on one element by offering solutions to leaders to overcome resistance to institutional change, foster digital culture, and create digitally-perceptive organizations. Despite its drawbacks, NIT remains a useful research theory in organization studies, although the discussions surrounding NIT have illuminated the advantages and disadvantages of its application in research.

In relation to DT, NIT enables us to understand how organizations adopt new digital technologies. Organizations are under increasing pressure to adopt digital technologies to remain competitive. However, the decision to do so is not always easy. It can be expensive and disruptive, and it can require a significant change in the traditional organizational culture to be digitally perceptive. Table 3 below indicates how complex DT phenomena become diffused within organizations through the various NIT isomorphic pressures.

Table 3. Reconciling the principles of digital transformation to the isomorphic pressures (Manda, 2022)

	Pillars of institutions
1. *The Data-driven* or data-informed decision-making – building consensus based on evidence	Cultural-cognitive
2. *Openness* – enabling transparency and access of information, sometimes by default	Cultural-cognitive/ regulative
3. *User-focused* – starting with user needs and testing early and often	Cultural-cognitive/normative
4. *Design-driven* – following a cycle of discovery, prototyping and delivery	Normative
5. *Iterative* – incorporating more agile working methods and rapid feedback cycles	Normative
6. *Interoperability* – maintaining an ability to share data and functions across systems	Normative
7. *Privacy and security* – preventing unauthorized access to systems and data	Normative/regulative

NIT suggests that organizations are more likely to adopt digital technologies if they perceive them to be legitimate. Legitimacy refers to the extent to which an organization's practices are perceived to be appropriate and acceptable by its stakeholders. In the context of DT, legitimacy can come from a variety of sources, such as industry leaders, government regulations, or customer demand (Loi et al., 2021).

Consequently, for purposes of this study, NIT remains relevant and has been applied to investigate the acceleration of DT within a South African public sector communication service.

2.3 CONCEPTUAL FRAMEWORK

A theoretical framework precedes a conceptual framework. The use of theory as a lens in research enables one to understand, elucidate, and estimate a phenomenon. Using a theory as a reference point, a logical model is developed to assist in solving the identified research problem, referred to as the conceptual framework (Creswell & Creswell, 2018).

As stated in Chapter 1, this study is predicated on a conceptual framework from a previous study. The aim is to empirically test the conceptual framework within a different country setting to grow the existing body of literature knowledge and contribute to practice.

The purpose of this study is to test the theory of NIT that DT initiatives become successful when DTL (an independent variable) and OA (an independent variable) having a positive influence on DT (a dependent variable) among junior, middle, and senior managers within a public sector communication service in South Africa. In the hypotheses, the independent variables DTL and OA are labelled as H1 and H2 respectively. Furthermore, the study will

investigate the mediating role of DTL on OA (labelled as H3a), as well as the mediating role of OA on DTL and OA (labelled as H3b).

The adopted conceptual framework was developed and tested by Ly (2023), as depicted in figure 9. This model is structured as follows:

(1) The impact of DTL on DT is investigated
(2) The impact of OA on DT is investigated
(3) The impact of DTL on OA is investigated
(4) The mediating role of OA on DTL and DT is also investigated

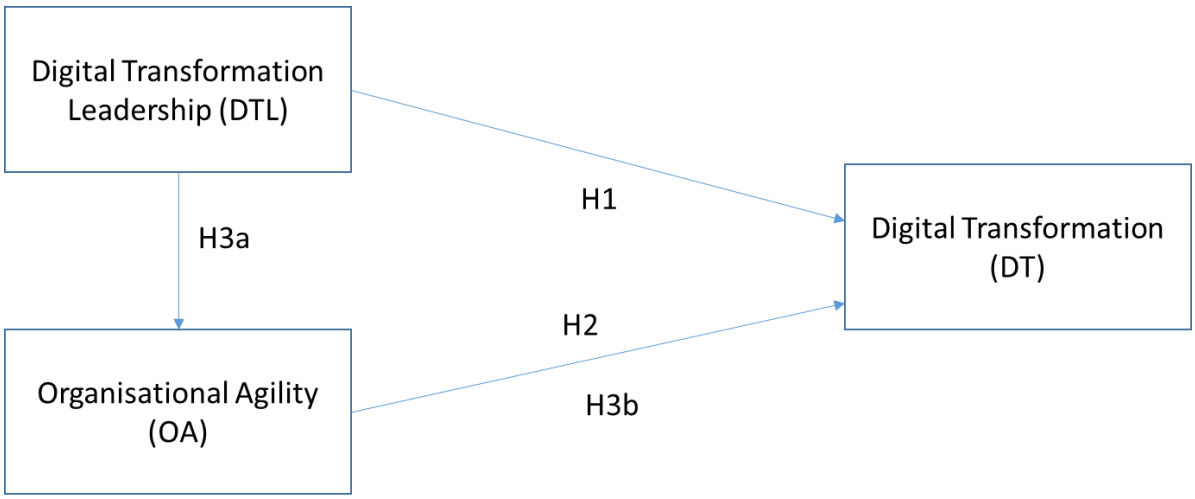

Figure 9: Conceptual Model for the study (Ly, 2023)

2.4 DEFINITIONS

2.4.1 INDUSTRY 4.0

Although various authors have sought to characterize Industry 4.0, there is no universally accepted definition for the Industry 4.0 era. What is agreed upon is that Industry 4.0 is characterised by five elements:

(i) digital conversion, optimization, and customized manufacturing
(ii) digitalization and acclimatization
(iii) People and technology interface
(iv) value-added offerings and convenient digital stores
(v) seamless data sharing and communication (Atik & Ünlü, 2019; Posada et al., 2021; Roblek et al., 2020).

By contrast, Castelo-Branco et al. (2022) argue that Industry 4.0 encapsulates three factors: (i) digital conversion and interconnected networks; (ii) converting service offerings and products into digital form; and (iii) creating market microstructure. On the other hand, Piccarozzi et al. (2021) state that Industry 4.0 has nine pillars, namely:

(i) Data analysis and processing
(ii) Autonomous machine
(iii) Replication
(iv) Flat and hierarchical systems homogenization
(v) The industrial web of things
(vi) Information technology security
(vii) The virtual cloud
(viii) 3D printing
(ix) Computer-mediated reality.

2.4.2 DIGITAL TRANSFORMATION

Feliciano-Cestero et al. (2023) state that DT encompasses a complete shift towards digital business integration, affecting all elements of the corporate strategy, divisional and operational strategies, and the implementation thereof. Organizations that manage the digital transition well can exploit the resultant opportunities brought by these disruptive innovative technologies to redefine their services and products, as well as create new markets (Ly, 2023). Individuals and organizations will have to embrace the demands imposed by the new digital economy by developing the requisite digital skills and capabilities.

Therefore, DT is not just about a shift towards greater use of digital technologies, according to (AlNuaimi et al., 2022). It is also disrupting the existing norms and standards and modifying the institutional arrangements to foster an agile culture and way of doing things. Consequently, the change may be overwhelming, especially for employees, thus requiring proper support mechanisms and effective change management.

By carefully managing the digital transition, organizations are able to improve their operational performance, address customer pain points, improve customer experience, and offer high-quality goods and services to meet the ever-growing demands of the digital business era (Bresciani et al., 2021). By so doing, organizations can stay afloat and continue to navigate the complex terrains imposed on them by often uncontrollable and unpredictable market forces (Nasiri et al., 2020). Thus, DT becomes a crucial tool of trade to effect the required transformation in order to radically improve business processes and value chains by leveraging new digital technologies. In addition, it is also about engendering a digital culture for sustained above-average organizational performance into the foreseeable future.

DT as a tool of trade is much broader than digital technology adoption. It is also about holistically embracing both the physical and digital ecosystems from the demand and supply sides of the market, as well as securing the ongoing support of the critical stakeholders to help the organization traverse the ever-changing and unpredictable digital landscape in order to prosper and survive (Vial, 2019).

The definition of DT by Gong and Ribiere (2021) was adopted for this study because DT affects all types of organizations, be they for-profit or non-profit organizations. Gong and Ribiere (2021) define DT as a significant change that changes the fabric of an organization, supported by the utilization of innovative digital technologies. It leverages key digital and other essential resources and dynamic capabilities in order to fundamentally improve the organization and meet and exceed the stakeholders' expectations. This definition by Gong and Ribiere (2021) offers us a much wider definition of DT to cater to not only commercial enterprises, but also non-profit and public sector organizations.

Hinings et al.'s (2018) definition of DT in the context of institutional set-ups provides further enrichment by stating that DT should not just be seen as an isolated occurrence but rather as a dynamic process that is able to reshape the very fabric of how things ought to work. Therefore, organizations stand to benefit immensely when they embrace digital shifts and are thus able to navigate the fluid landscape in order to remain relevant and afloat. These digital shifts introduce novel players, norms and standards, belief systems, and structures. Invariably, they can and do challenge, modify, augment, or replace the well-established rules of engagement in organizations, thus impacting ecosystems and industrial and sectoral structures.

DT manifests itself in digitally perceptive leadership that builds a digitally capable workforce and cohesive stakeholder networks, and reconfigures the institutional arrangements to create an agile, digitally enabled organization in order to scale up an integrated organization-wide performance to meet the needs of a digitally discerning and demanding customer.

2.4.3 DIGITAL TRANSFORMATION LEADERSHIP

According to Yadav et al. (2023), DTL is defined as the ability to traverse complex organizational dynamics by building effective networks and relationships with stakeholders in the implementation of DT. Powerful synergies can arise from established and well nurtured networks, contributing to a supportive and dynamic organizational culture. Similarly, digital excellence can be attained when the DTL inspires, empowers, and champions change for a digitally transformed organization. Digital excellence is stimulated and sustained in an environment in which DTL fosters trust and builds a digitally capable

workforce, in which cohesive teamwork is supported and nurtured in the implementation of DT initiatives (Ly, 2023). Therefore, by embodying the required DT attributes, DTL can serve as a reference point in terms of being a catalyst for DT initiatives to succeed (AlNuaimi et al., 2022).

Authors such as Abbu et al. (2022) characterize DTL as predicated on building the requisite credibility and trust with all stakeholders. These attributes find outward expression when the DTL leads by example through their actions, which serve as a guiding frame for employees to emulate. Importantly, the DTL should articulate an inspiring vision that becomes a catalyst for the development of an employee-centred digital strategy, deploying a hybrid of top-down and bottom-up consultation mechanisms to solicit inputs (Porfírio et al., 2021). The DTL should inculcate a digital culture based on sound norms and standards, responsible application of AI-enabled digital technologies that protect clients' personal information, employee health and wellness, and employee and corporate information security (Bresciani et al., 2021). Credibility is enhanced when appropriate and reasonable measures are taken to ensure business transactions are conducted within a sound cybersecurity environment (Illia, 2023). When the stated attributes guide every action taken by a DTL to implement DT initiatives, a cohesive networked organization can be built. In addition, the right digital competencies can be developed or attracted, rewarded commensurately, and retained because they are aligned with the digital ethos that defines the desired digitally enabled and agile organization.

Ultimately, DTL becomes a catalyst for the enablement of the organization's innovation and entrepreneurial culture and capability, a critical pillar that undergirds the DT efforts (Lei et al., 2020).

The common theme emerging from various authors' perspectives on DTL is that leaders who succeed often drive organization-wide transformation that is stakeholder-led, build and enhance employees' digital skills, inculcate a digital culture, and nurture and encourage an innovative culture that fosters risk-taking and experimentation (Kiron & Spindel, 2019; Sia et al., 2021).

2.4.4 ORGANIZATIONAL AGILITY

Shafiabady et al. (2023) define OA as the ability of the organization to sense and seize opportunities within its markets and beyond its operating environment in order to achieve its purpose through operational efficiency. The ability of an organization to cope and adapt well to changes by means of effecting innovative offerings that meet and exceed stakeholders' expectations in the midst of turbulence also enables it to redefine the future (Zhen et al., 2021). OA is further characterized by rapid manufacturing or production processes, the breaking down of siloed ways of operations, and embedding digital innovations into strategic management processes (Tshabalala & Marnewick, 2021; Üniü & Çalişkan, 2022).

Furthermore, OA is promoted by means of soliciting and incorporating customers' views into the value-creation processes and managing the influx of change responsibly and speedily. Whereas Ly (2023) states that an organization can disrupt its own policies and procedures, structures, processes, and ethos to foster an agile mindset and digital operations.

Additionally, public sector organizations can institutionalize agility by adopting some of the best practices of private sector organizations, such as eliminating red tape and streamlining their policies and procedures (AlNuaimi et al., 2022). Significantly, public sector organizations should not simply rely on consultants to develop their strategies and provide advisory services but should build these capabilities internally.

The ability of an organization to reconfigure itself to become agile can be learned. Just as the ability to develop the required rare and inimitable dynamic capabilities to transition from one method of operation to the other in order to create the "first mover advantage" and become a digital business leader. All these attributes enable an organization to be nimble and to create the necessary scale and network effects to be a truly exponential organization, leveraging various digital technologies (Walter, 2021).

OA is broadly characterized by quick adaptation and responsiveness to market changes by building the requisite unique dynamic internal digital capabilities to deliver customer-focused products and services of high quality conveniently.

2.5 PRIOR STUDIES

2.5.1 DIGITAL TRANSFORMATIONAL LEADERSHIP AND DIGITAL TRANSFORMATION

AlNuaimi et al. (2022) conducted a quantitative study using institutional theory and NIT as theoretical lenses within public sector organizations (*n* = 513) in Abu Dhabi, United Arab Emirates (UAE). The purpose of the study was to test a model intended to establish whether DTL and OA influenced DT with the digital strategy as a moderating factor. The results affirmed that a transformative style of DTL in the digital age, coupled with an agile organization, had a positive impact on DT. The study further affirmed that the style of leadership adopted and the promotion of an agile organization within the public service could improve DT.

Antonopoulou et al. (2021) conducted a Eurobarometer quantitative survey with a sample of 20 participants to determine the leadership types connected with DT skills and the extent to which these were linked to DTL. The study was conducted at higher learning institutions in Greece. The authors concluded that digitally savvy leaders, equipped with the requisite digital skills, were likely to effectively utilise the skills to the benefit of the higher learning community in an administrative capacity. These digitally skilled administrators were also more than likely to utilize their digital skills to exploit opportunities that presented themselves to run the higher learning institution far more optimally and effectively in order to meet their institutional mandates.

Ly (2023) conducted a quantitative study using NIT as a theoretical lens within a public organization (*n* = 388) in Cambodia. The objective of the study was to test a model developed by the aforementioned author to establish whether DTL impacted DT via an agile organization. The study affirmed the influence of transformative DTL in DT via OA, confirming that an alignment between organizational models and OA was crucial to the success of implementing DT. The study further provided insights into the role of differing leadership styles within an organization and the required speed needed within the public service to digitally transform operations.

In a quantitative study conducted with 330 participants, Obeidat (2018) sought to establish the impact of DTL on entrepreneurial adaptation within a commercial bank in Jordan. The research results indicated a significant effect of transformational leadership (as it related to stimulating intellectualism and inspiring motivation) on innovative adaptation. Furthermore, the learning organization capabilities were often a result of the influence of transformational leadership, which in turn affected entrepreneurial culture and behaviour.

Ratajczak (2022) conducted a literature review in universities using online research databases (n = 20). The author was able to assess and summarise published literature dealing with digitally perceptive leadership in higher learning institutions and to highlight future research opportunities on DTL in academia. The research results highlighted that the concept of DT in academia was still in its embryonic stage and, therefore, presented an opportunity for further future research.

The first hypothesis was formulated on the basis of the above findings:

Hypothesis 1: DTL positively impacts DT

2.5.2 ORGANIZATIONAL AGILITY AND DIGITAL TRANSFORMATION

OA is the ability of an organization to adapt to change quickly and effectively. Agile organizations can quickly respond to new opportunities and threats, learn from their mistakes, and adapt. They are also able to build and maintain a culture of innovation.

Alkhoori et al. (2021) conducted a quantitative study among 323 technopreneurs (individuals who specialize in setting up computer-related entrepreneurship) in the UAE. The aim was to establish whether certain leadership qualities had a positive impact on technopreneurs and whether digital enablers had a positive impact on technopreneurs, whether digital enablers mediated the relationship between leadership qualities and technopreneurs successfully. The results affirmed the positive relationship between leadership qualities, with technopreneurs and digital enablers. The findings further affirmed the role of digital enablers as a mediating factor in the relationship between leadership qualities and successful technopreneurs.

In a quantitative study conducted with 216 participants, AlNuaimi et al. (2021) advanced the proposition that institutions that reconfigured and incorporated opportunities that arose from the digital procurement of big data into their resources and capabilities were likely to achieve marked improvement in their environmental performance outcomes. Although the research results did not find that digital procurement influenced environmental performance outcomes, digital procurement was found to have an influence on big data analytics capabilities. However, the introduction of big data analytics capabilities to mediate the role of e-procurement and environmental performance resulted in a significant and positive impact of digital procurement on environmental performance outcomes.

A quantitative study was conducted by AlNuaimi et al. (2022) within public sector organizations (*n* = 513) in Abu Dhabi, UAE. The purpose of the study was to test a model developed by the same authors that sought to establish whether both DTL and OA influenced DT with the digital strategy as a moderating factor. The outcome of the study indicated that OA was a mediating factor between DTL and DT. The study affirmed that DTL had a positive effect on DT via OA, confirming that an alignment between organizational models and OA was crucial to DT. The study yet again, affirmed that the style of leadership adopted and the promotion of an agile organization within the public service can improve DT.

Jin et al. (2022) conducted a quantitative study among 307 employees within Chinese multi-national companies (MNCs). The authors sought to establish whether servant leadership (an important DTL attribute that focuses on supporting and nurturing individual employees rather than an organization as a whole, in addition to inspiring individuals and teams) influenced an innovation culture and behaviour among Chinese employees in the identified MNCs. They found that servant leadership played a crucial role in enhancing innovative behaviour in employees. Moreover, servant leadership had an impact on employees feeling safe and on work-life balance. Furthermore, when there was work-life balance, coupled with employees experiencing work safety, these two factors tended to serve as mediating factors in employee innovative behaviour and servant leadership. Lastly, a conducive organizational climate was seen to be a moderating factor in the nexus between employee innovation practices and servant leadership.

Ly (2023) conducted a quantitative study within a public organization (*n* = 388) in Cambodia. The objective of the study was to test a model the aforementioned author had developed to establish whether DTL had an impact on DT via an agile organization. The results affirmed that transformative DTL and OA had a positive effect on DT, confirming that an alignment between organizational models and OA with DTL was crucial to DT. The study further illuminated insights into the important role of different organizational types of leadership and the agility needed within the public service to digitally transform.

Montasser et al. (2023) conducted a quantitative study of 124 publicly listed companies in Indonesia to establish whether transformational leadership (TL) had a positive impact on digital business model innovation (DBMI) through organizational readiness (OR) and IT-enabled dynamic capabilities (ITeDC). They found that TL indirectly affected DBMI via OR and ITeDC. Further, organizational readiness was found to have a positive impact on DBMI. However, the mediating effect of OR on DBMI via ITeDC was only partially established.

Vinarski-Peretz and Kidron (2023) conducted a quantitative study in two phases among 298 adults in the public sector in Israel. The authors sought to establish the role organizational innovation climate plays in improving individual creative effectiveness and also team or collaborative creative effectiveness. The research results demonstrated that an innovation culture in the public service played a crucial role in enhancing individual and collective employee behaviour towards implementing innovative practices.

Consequently, the following hypothesis was posited for this study:

Hypothesis 2: OA positively impacts DT.

2.5.3 DIGITAL TRANSFORMATIONAL LEADERSHIP, ORGANIZATIONAL AGILITY, AND DIGITAL TRANSFORMATION

A quantitative study was conducted by AlNuaimi et al. (2022) within a public sector organizations (*n* = 513) in Abu Dhabi in the UAE. The purpose of the study was to test a model developed by the same authors intended to establish whether both DTL and OA influenced DT, with digital strategy as a moderating factor. The outcome of the study further indicated that OA was a mediating factor between DT leadership and DT. The study affirmed

that DTL and OA impacted positively on DT. The study further affirmed that the style of leadership adopted and the promotion of agile organization within the public service can improve DT.

Ly (2023) conducted a quantitative study within a public organization (*n* = 388) in Cambodia. The objective of the study was to test a model the author developed to establish whether DTL influenced DT via OA. They found that transformative DTL had a positive effect on DT via OA, confirming that an alignment between organizational models and OA was crucial to DT. The study further provided insights into the important role of differing organizational types of leadership and the agility needed within the public service to digitally transform.

Consequently, the following hypotheses were posited:

Hypothesis 3a: DTL positively impacts OA

Hypothesis 3b: OA mediates the relationship between DTL and DT

2.6 CONCLUSION OF THE LITERATURE REVIEW

The review of the literature has indicated the complex nature of DT. It has also revealed the crucial roles of (i) DTL and DT, (ii) OA and DT, and (iii) DTL, OA, and DT. The emergence of servant leadership as an alternative form of leadership, which is partly similar to DTL, was also observed. However, studies that cover the impact of DTL and OA on DT are scant, with reference to both public and private sector organizations.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 RESEARCH APPROACH

Research methods provide researchers with tools and techniques for systematically investigating complex phenomena. The quality of the research results depends heavily on the methodology adopted, the collection of quality data, and the provision of credible results to address the research problems or opportunities.

Creswell and Creswell (2018) note three research approaches to collecting and analysing data for research purposes, namely (i) qualitative, (ii) quantitative, and (iii) mixed methods.

Theories serve different purposes in the three approaches to research inquiry. In quantitative research, they provide a proposed explanation for the relationship among variables being tested. In qualitative research, they may often serve as lenses for the inquiry, or they may generate lenses during the study. In mixed-methods studies, researchers employ methods associated with both quantitative and qualitative approaches.

Qualitative studies are explorative in nature and might produce an inquiry or theoretical lens, while quantitative studies investigate and establish relationships between variables, using a developed research model. Mixed-method studies are in-depth explorations of phenomena. Thereafter, research instruments or models are developed and tested through the collection of quantitative data to either affirm or disprove a theory.

The researcher utilized quantitative study model previously developed by Ly (2023), looking at the impact of DTL and OA on DT, the mediating role of DTL on OA, and the mediating role of OA between DTL and DT.

3.2 RESEARCH DESIGN

A cross-sectional study, in which data was collected at one point in time, was conducted using a survey as an instrument. Primary research data was collected from a sample of participants within a specific public-sector communication service organization.

A cross-sectional study is useful when it is carried out to establish a relationship between more than one variable. Using this method, data could be collected from the sample, and the results could be assessed and then generalised within a specific population or much more broadly.

The researcher opted to use the quantitative research method to investigate the role of DTL and OA on DT using an existing research instrument due to the constraints of time and budget. If it were not for the constraints stated, the researcher would have adopted a mixed-methods approach to delve in-depth into some of the respondents' feedback based on the quantitative study. This would have enabled the researcher to assess, qualitatively, the nuances relating to their understanding of the role of DTL and OA on DT. Through the probing, further insights into the respondents' perspectives on the role of DT in the public sector – in terms of the triggers and barriers of innovation and entrepreneurship – could have been elicited.

3.3 DATA COLLECTION METHODS

The electronic questionnaire was sent via an anonymous link generated from Qualtrics software to the targeted respondents. This was done after approval to conduct the study in GCIS was obtained, following a request made to the Director-General, as per Annexure E.

The data was collected over a period of six weeks (between October and November 2023). A five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree) was used to measure each indicator within a variable.

The following process was followed:

(i) The instrument was loaded into Qualtrics.
(ii) The instrument was tested among GCIS research officials to assess its user-friendliness and to address any glaring gaps from the perspective of the end-user.
(iii) The research instrument was sent to the targeted managers in October 2023 via an internal communication database with an anonymous Qualtrics survey link (to guarantee confidentiality to the end-user).

(iv) Follow-ups were made to ensure as many targeted respondents as possible participated.

(v) The survey was closed in November 2023, and 184 responses were received.

3.4 POPULATION AND SAMPLE

3.4.1 POPULATION

The total population within the public sector organization chosen for this study was 424. The study targeted members of the organization who were expected to play a part in driving DT.

3.4.2 SAMPLE AND SAMPLING METHOD

A convenience sampling method was utilised because the intention of the study was to target those in management positions who were conveniently accessible and considered critical in driving DT initiatives. A sample size of 278 made up of junior to senior GCIS directors was selected, given their role, in some form or shape, in DT initiatives within the public sector communication organization chosen. The targeted respondents were accessed through an anonymous link sent through the email database provided to the researcher.

The study was affected by resignations and technical challenges that resulted in some respondents not being able to complete the survey in full.

To address the issue of variability in the sampling procedures, more than 70 of the chosen samples were disbursed across the length and breadth of South Africa in all nine (9) provinces, bringing a varied wealth of experience across the nine provinces and approximately 234 municipalities. This national footprint was valuable in terms of providing snippets of some of the varying governance and cultural dynamics involved in providing strategic communication support to the government-wide communication system across these three spheres of government through intergovernmental relations prescripts.

These nine provincial offices work with the provincial and municipal government departments in crafting the provincial and municipal departmental and clustered

communication strategies to ensure integrated planning through provincial communicators forums, municipal and district communicators forums, and to share content on various government programmes for integrated communication purposes. They also assist in the implementation of development communication projects, oftentimes informed by results from community stakeholder engagements (conducted in community halls or, to some extent, post COVID-19 via virtual platforms). The decision-making in terms of the day-to-day operations of the provincial offices is mostly decentralised.

3.5 THE RESEARCH INSTRUMENT

Ly's (2023) research instrument, an online questionnaire (see Annexure A), was utilized.

PART A: The first part of the questionnaire comprised questions about the participants' demographic attributes:

(i) Gender
(ii) Age group
(iii) Highest qualification

This author augmented the demographics by including the following items, in line with AlNuaimi et al.'s (2022) study, published a year earlier, which was largely similar to Ly's (2023) study. Only the digital strategy measurements from AlNuaimi et al. (2022) were excluded.

(iv) Years implementing DT
(v) Business unit of the respondent
(vi) Management position

The additional elements were to assist in understanding the views of the participants on DT by GCIS location and business unit. These would assist the users of this report in prioritizing the implementation of the recommendations that were to arise from this study, where areas of improvement were identified.

The second part of the questionnaire comprised items to measure the three variables stated in the research hypotheses.

(i) A five-point Likert scale was applied to rank each participant's responses across the three variables (for details, see **Appendix A**). The five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) for all scales was classified as significant in Ly's (2023) study. The scales used in this study have been widely used in studies investigating the concepts of DT, innovation, and leadership.
(ii) The respondents were required to respond to each statement using the five-point Likert scale by indicating the degree to which they agreed or disagreed with it.
(iii) The operational definition of the variables or key constructs that are the subject of this study is provided in Chapter 2 above.
(iv) Samples of some of the questions are provided below.

Part B: DTL. The scale items from previous literature Ly (2023) were utilized. DTL had six items that Ly (2023) had adapted from Chen and Chang (2013) and Podsakoff et al. (1996) to align with DT.

Example of the construct, one measure, and measurement scales:

Table 4: Construct, measure, and measurement scales for DTL

In this section, the aim is to explore your perspective on the role of digital transformational leadership on digital transformation in the public communication service. To what extent do you agree or disagree with the following statement(s):						
Construct	**Question**	**Strong disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
DTL	DTL2: Our leaders provide a clear digital transformation vision for the organization's members to follow.					

Part B: OA. Six items relating to OA from Ly (2023), four of which had previously been adapted from Cegarra-Navarro et al. (2016), were utilised.

Example of the construct, one measure, and measurement scales:

Table 5: Construct, measure, and measurement scales for OA

In this section, the aim is to explore your perspective on the role of organizational agility on digital transformation in the public communication service. To what extent do you agree or disagree with the following statement(s):						
Construct	**Question**	**Strong disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
DTL	OA4: We rapidly implement decisions to face market and government changes.					

Part C: DT. Finally, DT comprised five items adopted from Ly (2023), which had been previously adapted from the seminal work of (Nasiri et al., 2020).

Example of the construct, one measure, and measurement scales:

Table 6: Construct, measure, and measurement scales for DT

In this section, the aim is to explore your perspective on the role of digital transformation in the delivery of public communication service. To what extent do you agree or disagree with the following statement(s):						
Construct	**Question**	**Strong disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
DTL	DT1: In my organization, we aim to digitalize everything that can be digitalized.					

3.6 DATA ANALYSIS AND INTERPRETATION

Because Ly's (2023) research instrument was adopted for the purpose of collating data within a South African context, the same methodology to analyse the data was utilized, namely structural equation modelling (SEM) as well as PLS-SEM covariance-based testing. PLS-SEM covariance-based testing is precise in analysing data from nonparametric and novel studies (Henseler, 2018; Ly, 2023). It is also useful in interpreting new complexities arising from existing theories (Hair et al., 2021).

IBM SPSS Statistics version 28 was utilized to perform the analysis, with a significance level of .05 adopted. To test the hypotheses, regression and mediation analyses were performed using the PROCESS Procedure for SPSS Version 3.4 (Ringle et al., 2022).

Spearman's Rho statistical tool was used to measure the association's strength between pairs or combinations of the constructs.

The Spearman's Rho values range between -1 and 1. The absence of a linear correlation is depicted by 0, whereas the numeric number 1 indicates perfect positive correlations. A perfectly negative correlation is indicated by -1. Perfect correlations imply that an increase or decrease in one variable has a similar effect on the other.

The correlation coefficients were tested using the guide provided by Hinkle et al. (2003) and a regression statistic tool was used to determine the relationship between the dependent variable, DT, and the independent variables (DTL and OA), as follows:

i. Coefficients between 0.00 and 0.30 imply a very weak correlation.
ii. Coefficients between 0.30 and 0.50 imply a weak correlation.
iii. Coefficients between 0.50 and 0.70 imply a moderate correlation.
iv. Coefficients between 0.70 and 0.90 imply a strong correlation.
v. Coefficients between 0.90 and 1.00 imply a very strong correlation.

The correlation was regarded as significant if the *p* value was less than .05.

The regression statistic tool was adopted to determine the relationship between the dependent variable, DT, and the independent variables of DTL and OA predictors. The regression equation illustrates the relationship between the predictor variables and the dependent variable. It is depicted as $y = (b0 + b1x1 + b2x2) + e1$.

y = DT
x1 = DTL
x2 = OA
b0 = the intercept or the constant
b1 = the DTL regression coefficient
b2 = the OA regression coefficient

3.7 VALIDITY AND RELIABILITY

Quality assurance measures were instituted by the researcher to ensure the research instrument selected or developed is of high quality, and that the research methodology is dutifully followed in accordance with research best practices or standards (Creswell & Creswell, 2018; Saunders et al., 2016).

The following factors are utilised to measure the quality of the research instrument:

i. External validity (in terms of the generalizability of the research results)
ii. Reliability
iii. Internal validity
iv. Objectivity.

The above factors are explained below.

3.7.1 Validity

“External validity” refers to the extent to which the causal relationship between variables within a dataset is generalizable to other people and organizations within or outside the same sector or country (Creswell & Creswell, 2018; Saunders et al., 2016). Ly (2023) tested the measurement instrument in Cambodia and the results are indicated in Appendix G. The instrument was uploaded into Qualtrics after review and approval by the supervisor, with the supervisor’s inputs incorporated before the final version was distributed to the respondents.

3.7.2 Reliability

The measurement instrument should measure precisely what it was designed to measure. Internal validity is realised when the relationship between the constructs holistically represents the elements of the study and there is a correlation between the criteria followed for the study and the content collected through a fair process (Creswell & Creswell, 2018). A strong correlation of items in the instruments is present when internal consistency is high and the Cronbach’s alpha coefficient is significantly closer to the value 1. By contrast, low internal consistency, with the Cronbach’s alpha coefficient closer to the value 0, indicates

weaker consistency and reliability (Hair, 2018). Table 7 provides a summary of the Cronbach's alpha range and association. The measurement was also tested in the previous study, and the results are provided in Appendix G.

Table 7. Cronbach's alpha interpretation (Creswell & Creswell, 2018)

ALPHA COEFFICIENT RANGE	STRENGTH OF ASSOCIATION
< 0.6	Poor
0.6 < 0.7	Moderate
0.7 < 0.8	Good
0.8 < 0.9	Very Good
≥0.9	Excellent
Note: If alpha > 0.95, items should be inspected to ensure they measure different aspects of the concept.	

3.7.3 Internal Validity

Again, the measurement instrument should measure precisely what it was designed to measure. Internal validity is realised when the relationship between the constructs holistically represents the elements of the study, and there is a correlation between the criteria followed for the study and the research data collected through a fair process (Creswell & Creswell, 2018). Internal validity is tested by means of convergent and discriminant validity. Convergent validity is tested by means of average variance extracted (AVE). Whereas discriminant validity is tested by means of heterotrait-monotrait ratio (HTMT), the PLS-SEM algorithm was utilized to test the measurement model (Hair et al., 2021).

3.7.4 Objectivity

The measurement instrument should not include questions designed to sway the participants in a specific, preconceived direction. Bias is present when research questions are explicitly positive or negative or make unfounded claims about the participants. Therefore, the questions in a measurement instrument should be free from bias to mitigate against the quality of the research outcomes. Bias also arises when there are missing values in the data and there are no effective treatment options to address the missing values.

Therefore, the researcher should develop a treatment plan for missing data to avoid the presence or otherwise of bias, which might affect the outcome of the study. Additionally, the structural model, which was previously tested as per Annexure H in the study by Ly (2023), should be examined for collinearity using the variance inflation factor (VIF), a test suggested by (Creswell & Creswell, 2018; Hair et al., 2021).

IBM SPSS Statistics version 28 was used to perform the analysis, covering frequency tables, descriptive statistics, and correlations. The data analysis consisted of frequency tables (counts and percentages) for categorical variables and reliability analysis (Cronbach's alpha). Confirmatory factor analysis was performed to validate the measurement model, and the lavaan package version 6.15 in R software was used to perform the analysis (Yves, 2012). For the descriptive statistics, means, standard deviations, skewness, kurtosis, and correlations were performed using IBM SPSS Statistics version 28. Mediation analysis was performed. To test the hypotheses using the Smart PLS (Ringle et al., 2022).

3.8 LIMITATIONS

Research projects inherently contain limitations. It is crucial that the researcher outline the limitations affecting the study and that measures be taken to address the limitations (Creswell & Creswell, 2018).

In relation to this study, the following limitations were identified:

- The research results might not be generalized to other public sector organizations that are undertaking the DT journey in their own ways.
- The period during which the research was conducted might influence its outcome. Given the waning sense of urgency for public sector organizations to digitally transform post COVID-19, there might have been differing views about the DT journey among the participants.
- The fact that only two quantitative studies have so far been attempted to assess the impact of the two endogenous factors (DTL and OA) on DT might imply that the concepts are not widely understood and appreciated.

3.9 ETHICAL CONSIDERATIONS

It is generally accepted practice in any business research study that ethical issues such as the names of the sponsors, protection of the identities of the respondents, incentives to participants, and participants' consents are properly addressed. If these issues are not addressed, they might affect the credibility of the process and the findings and recommendations (Creswell & Creswell, 2018).

To ensure compliance with ethical practices, the following measures were instituted:

i. An application was submitted to the Wits University Ethics Committee for consideration and approval. This study was rated low-risk and consequently received ethical approval: **WBS/DB0010909w/420** (see Annexure D).
ii. The participants' consent to partake in the study was incorporated into the electronic research instrument. When the potential participants elected to participate out of their own free will, they consented with a "yes" and proceeded to fill out the questionnaire. In the event that they elected not to participate and did not consent, the electronic questionnaire defaulted to thanking them and terminating their participation.
iii. The participants were assured that the information provided would be treated confidentially (in conformity with the Protection of Personal Information Act no. 4 of 2023), and this was explained in the electronic questionnaire cover sheet. During the collection of data, participants were not required to provide their personal details, such as names and surnames, personal identification numbers, or physical and mobile contact numbers. Data collected was digitally stored on mediums that required two-factor authentication to protect it from prying eyes.
iv. The participants did not receive any incentives from the researcher to take part in the study.
v. This study did not receive any sponsorship or grant funding.

4 KEY RESULTS AND FINDINGS

In this chapter, the results of the survey are presented. The sample description is provided for an understanding of the context of the research population. Thereafter, descriptive statistics are reported. In the last section of this chapter, informed by results from hypotheses testing, the relationship between DTL and OA and their impact on DT is described. Thereafter, the relationship between DTL, OA, and DT is indicated. Finally, whether OA mediates the relationship between DTL and DT.

4.1 SAMPLE

The data was assessed for missing values. Missing values or data refers to a problem in statistics where one or more respondents in the sampling frame have not fully completed the survey items (Newman, 2014). Missing values occur due to various factors, including (1) where the respondent intentionally opts to skip or disregard an item perceived to be sensitive; (2) where the respondent inadvertently forgets to come back and complete the study; and (3) where the researcher does not reasonably foresee that there may be programming or computation errors affecting the completion of the questionnaire (Rogelberg et al., 2003)

In this study, the missing values were mostly not random. For that reason, out of 180 cases, 134 were usable and 46 were excluded. The 134 valid responses that were received via the SPSS application system, represent a 48.91% response rate.

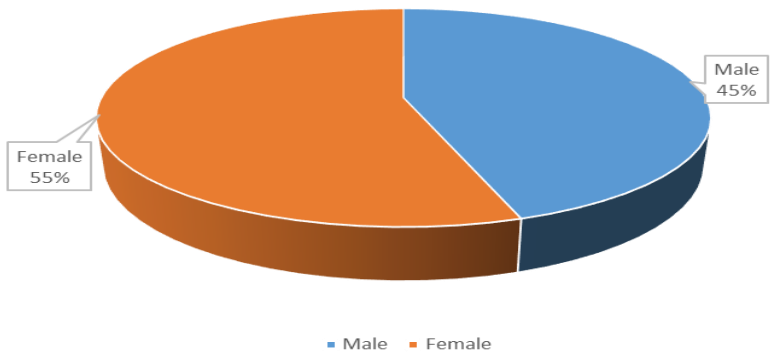

Figure 10. Gender statistics

Table 8. Gender Statistics

GENDER				
	Frequency	**Percent**	**Valid percent**	**Cumulative percent**
Male	60	44.8	44.8	44.8
Female	74	55.2	55.2	100.0
Total	**134**	**100.0**	**100.0**	

Table 8 and Figure 10 show the breakdown of gender statistics. The results show that 44.8% of males and 55.2% of females responded to the survey. The statistics point to commendable efforts made to meet male and female gender parity in light of the ever-growing calls by civil society for corporate governing bodies and government leaders to ensure that women are developed and form part of key decision-making structures within public and private sector organizations.

Table 9. Age Statistics

AGE GROUP				
	Frequency	**Percent**	**Valid Percentage**	**Cumulative Percentage**
26–35 years	15	11.2	11.2	11.2
36–45 years	59	44.0	44.0	55.2
46–55 years	48	35.8	35.8	91.0
56+ years	12	9	9	100.0
Total	**134**	**100.0**	**100.0**	

As indicated in Table 9, 15 (11.2%) of the 134 respondents were between the ages of 26 and 35 years old, 59 (44%) were 36–45 years old, 48 (35.8%) were between the ages of 46 and 55, and 12 (9%) were 56 years of age and older. The results demonstrate that there was no bias in the distribution of the research questionnaire to the respondents.

Table 10. Educational Level Statistics

HIGHEST EDUCATIONAL LEVEL				
	Frequency	**Percent**	**Valid percent**	**Cumulative per cent**
Other	2	1.5	1.5	1.5
Matric/Certificate	2	1.5	1.5	3
Diploma/Degree	69	51.5	52.3	55.3
Honours	34	25.4	25.8	81.1
Masters	21	15.7	15.9	97
PhD	4	3	3	100.0
Total	**132**	**98.5**	**100.0**	
Missing	2	1.5		
	134	**100.0**		

Table 10 shows that most (69, 52.3%) of the respondents' educational level was a diploma or a degree. The lowest, at four (3%), were those who had either matriculation (two, 1.5%), or unspecified (two, 1.5%).

The employment position of the participants was also used in the analysis of the variables. It was crucial to distinguish between the functions and responsibilities of their positions, given the complexity of the concepts under study.

Table 11. Employment Position Statistics

EMPLOYMENT POSITION				
	Frequency	**Percentage**	**Valid percentage**	**Cumulative percentage**
Assistant Director	55	41.0	41.7	41.7
Deputy Director	41	30.6	31.1	72.8
Director	29	21.6	22	94.8
Manco member	7	5.2	5.3	100.0
Total	**132**	**98.5**	**100.0**	
Missing	2	1.5		
Total	**134**	**100.0**		

Table 11 shows that 55 (41.7%) of the respondents were employed at the level of assistant director. The lowest employment or management position results were recorded for Management Committee (Manco) members at seven (5.3%). The employment levels are crucial in this study in the context of the complex phenomenon of DT. Manco members play a crucial role in setting the strategic direction and directing the implementation of the reformative measures required for the adoption and diffusion of DT organization-wide and holistically across the public sector communication service. As previous studies have shown, the role of other directors below Manco level cannot be reduced to a footnote because operationalization of the DT initiatives also relies on management positions below Manco, such as senior, middle, and junior directors.

Table 12. Digital Transformation Experience Statistics

NUMBER OF YEARS IMPLEMENTING DIGITAL TRANSFORMATION				
	Frequency	**Percentage**	**Valid percentage**	**Cumulative percentage**
Less than 1 year	16	11.9	12	12
1–2 years	18	13.4	13.5	25.5
3–-5 years	33	24.6	24.8	50.3
6–10 years	34	25.4	25.6	75.9
11–15 years	19	14.2	14.3	90.2
16–20 years	8	6.0	6.0	96.2
Over 20 years	5	3.7	3.8	100
Total	133	99.2		100.0
Missing	1	.7		
Total	**134**	**100.0**		

Table 12 shows that 67 (50.4%) of the respondents had DT experience for three to five years and six to 10 years collectively. The lowest number of respondents were those with 20 or more years of DT experience at five (3.8%). There was one missing data record, constituting one (1%). These results are encouraging and should contribute to the quality of the respondents' feedback on the survey study. Equally, with increasing pressure for the government to engender public trust through transparent public communication, according to Pandey (2023), effective use of digital public communication platforms should be realised

through the existing collective DT experience of public sector communication service directors.

Table 13. Departmental Group Statistics

DEPARTMENTAL GROUP – SELECTED CHOICE				
	Frequency	**Percentage**	**Valid percentage**	**Cumulative percentage**
Core business staff – Head Office	60	44.8	46.5	46.5
Non-core business staff – H/O	29	21.6	22.5	69.0
Pooled Provincial Offices	40	29.9	31.0	100
Total	**129**	**96.3**	**100.0**	
Other (missing)	5	3.7		
Total	**134**	**100.0**		

Table 13 shows the results of the respondents by core public communication services, support services, and their office locations. Most of the core staff members (directors) were located at the head office, constituting 60 (46.5%). Non-core staff members (directors) at the head office account for the lowest number of respondents at 29 (22.5%). Collectively, pooled statistics for the core staff members (directors at various levels) at the nine provincial offices represent 40 (31%) of the respondents.

Overall, the core staff members at the provincial offices, included as part of the sample size for purposes of observing any data variability, represent under a quarter (22.5%) of the total valid responses received.

The structural model was assessed for goodness-of-fit relative to the data using the PLS-SEM. The value of the goodness-of-fit index closer to 1 indicates a good fit, whereas any value closer to 0 indicates the lack of fit. All index values were closer to 1, thus affirming the fit of the hypothesized model and the studied covariance matrix. Table 14 below provides the summary of the results.

Table 14. Goodness-of-fit index

Goodness-of-fit index	Model	Acceptable model fit
χ2 /df	1.971	Between 1-5

Goodness-of-fit index	Model	Acceptable model fit
CFI	0.954	CFI≥0.90 (Good fit)
TLI	0.942	TLI ≥0.90 (Good fit)
RMSEA	0.071	RMSEA<0.08 (Good fit)
SRMR	0.085	SRMR<0.08 (Good fit)

Note. χ^2= Chi-square statistic; *df* = Degrees of freedom; CFI = Comparative fit index; TLI = Tucker-Lewis index; RMSEA = Root mean square error of approximation; SRMSR = Standardized root mean square residual (Hu & Bentler, 1999).

4.2 DESCRIPTIVE STATISTICS OF VARIABLES

This section contains the statistics relating to DTL, OA, and DT.

With regard to DTL, the highest mean was recorded for DTL6, which states, “Leaders encourage all members to think about DT ideas.” with a score of 3.52 and a standard deviation of 1.060. The lowest mean was recorded for DTL5 (“Leaders in my organization consider the DT beliefs [mind-sets] of all members.”) with a mean of 3.23 and standard deviation of 1.089, which was closely followed by DTL2 (Leaders provide members with a clear DT vision.) at 3.25 and standard deviation of 1.100. The two lowest means on DTL serve to highlight the current perceived DTL gap in terms of driving DT within the public sector communication service through a DT strategy.

With regard to OA, the highest mean was recorded for OA5 (“We seek ways to reinvent our organization continually.”) with a score of 3.64 and a standard deviation of .984. The lowest mean was recorded for OA4, which states, “We respond quickly to market and government changes.” with a mean of 3.32 and a standard deviation of 1.180. Without OA, the institution will not be able to exploit opportunities in the market and regulatory environment to scale up communication services to address the public trust deficit arising from a perceived lack of government communication transparency. Therefore, as part of the institutional digital reforms, management would need to foster new methods of working in the Industry 4.0 era predicated on agility and responsiveness.

With regard to DT, the highest mean was recorded for DT5, which states, “My organization strives towards digital information sharing.” with a score of 3.82 and standard deviation of .964. The lowest mean was recorded for DT1 (“My organization strives to digitalize everything possible.”) with a mean of 3.41 and a standard deviation of 1.071. Table 15 presents a detailed analysis of the research results. The full benefits arising from new innovative technologies will not be realized if digitalization efforts are fragmented and incoherent. Therefore, the digitalization process should be predicated on a DT strategy to build a truly agile organization that leverages DT to exponentially broaden access to government information for segments that were previously marginalized.

Table 15. Descriptive Analysis of Variables

Item	N	Mean	SD
Digital Transformation Leadership			
DTL_1 Leaders inspire all members with the DT plans for our organization	134	3.46	1.073
DTL_2 Leaders provide members with a clear DT vision	134	3.25	1.100
DTL_3 Leaders motivate team members to accomplish the same DT goals	132	3.45	1.014
DTL_4 Leaders in our organization encourage all members to reach DT goals	134	3.39	1.047
DTL_5 Leaders in my organization consider the DT beliefs (mind-sets) of all members	134	3.23	1.089
DTL_6 Leaders encourage all members to think about DT ideas	134	3.52	1.060
Valid N (listwise)	132		
Organizational Agility			
OA_1 We can quickly accommodate individual and government needs	134	3.43	1.099
OA_2 We can rapidly adapt processes and activities to meet demand fluctuations	134	3.38	1.102
OA_3 We can handle issues from suppliers and partners efficiently	134	3.57	.984
OA_4 We respond quickly to market and government changes	134	3.32	1.180
OA_5 We seek ways to reinvent our organization continually	134	3.64	.984
OA_6 We see government and market trends that provide for speedy expansion	134	3.44	.993
Valid N (listwise)	134		
Digital Transformation			
DT_1 My organization strives to digitalize everything possible	134	3.41	1.071
DT_2 My organization collects vast amounts of data from several sources	133	3.75	.908
DT_3 My organization aspires to use digital technologies for additional activities	134	3.69	.886
DT_4 My organization strives to use digital technology to improve service quality	134	3.66	1.012
DT_5 My organization strives towards digital information sharing	134	3.82	.964
Valid N (listwise)	133		

Several observations arose in the disaggregated data in terms of public communication service offerings and the location of staff members. Provincial officers collectively recorded the highest mean for DT at 3.99, DTL at 3.73, and OA at 3.70. Interestingly enough, head office core staff members recorded the lowest mean across the three conceptual elements, with DT at 3.44, DTL at 3.23, and OA at 3.23. The summarised results are provided in Table 16 below.

Overall, DT recorded the highest mean at 3.66, followed by DTL and OA at 3.41 and 3.45, respectively.

Table 16. Descriptive Analysis of Variables (Location and Services Type)

Disaggregated by services and location		N	Mean	Std. Deviation
Core staff - Head Office	DT	60	3,4467	0,89243
	DTL	60	3,2311	0,97581
	OA	60	3,2389	0,97490
Core staff - Provincial offices	DT	40	3,9900	0,57459
	DTL	40	3,7333	0,73166
	OA	40	3,7000	0,62270
Support Staff - Head Offices	DT	29	3,6552	0,78358
	DTL	29	3,3322	0,88149
	OA	29	3,5632	0,82305
Total	**DT**	**129**	**3,6620**	**0,81079**
	DT Leadership	**129**	**3,4096**	**0,90611**
	OA	**129**	**3,4548**	**0,86471**

The data was statistically examined for skewness and kurtosis. The skewness test measures whether the data is sparsely distributed or centrally located. The kurtosis test measures whether high data outliers characterized as heavy-tailed exist or whether low-data outliers characterized as light-tailed exist.

Based on the results, none of the skewness values were outside the range of −1 and +1, and the results are therefore considered to be more than acceptable. Kurtosis

values above +2 and below -2 are considered to be at their highest or lowest point, respectively, and are therefore concerning (Hair et al., 2022). Kurtosis values should be closer to 0 to be acceptable. As shown in Table 17, the values for both skewness and kurtosis were within the acceptable range, suggesting that the data was normally distributed. Furthermore, the table provides the average mean for each dimension.

Table 17. Descriptive statistics scales

Dimension	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
DTL	134	1.00	5.00	3.3818	.90908	-.543	-.014
OA	134	1.00	5.00	3.4639	.85605	-.483	-.026
DT	134	1.00	5.00	3.6642	.80023	-.950	.790
Valid N (listwise)	134						

4.3 RELIABILITY (MEASUREMENT MODEL)

As noted above, the measurement model used in this study was previously quality-tested for internal consistency for Cronbach's alpha and composite reliability as per Appendix G (Ly, 2023). The measurement model was also re-examined in this study for internal consistency for each scale. The composite reliability (CR) is used to measure internal consistency because it provides an accurate estimate of the reliability of the latent construct by taking into account the measurement error associated with each indicator. The recommended value for CR is 0.7, which is similar to Cronbach's alpha value (Fornell & Larcker, 1981).

The average variance extracted (AVE) was also examined in Ly's (2023) study. AVE is utilized to evaluate the convergent validity of the latent variables. It was also re-examined in this study. The recommended AVE value is greater or equal to 0.5. All the scores for Cronbach's alpha, composite reliability, and average variance extracted were above the recommended minimum thresholds, suggesting that the constructs met the validity and reliability criteria. Table 18 contains a summary of the main findings arising from the examination (loadings, Cronbach's alpha, CR, and finally AVE).

Table 18. Assessing the measurement model

Construct	Loadings	Cronbach's alpha	CR	AVE
Digital transformation leadership		**0.926**	**0.928**	**0.73**
DTL_1	0,857			
DTL_2	0,869			
DTL_3	0,878			
DTL_4	0,863			
DTL_5	0,852			
DTL_6	0,807			
Organizational agility		**0.893**	**0.91**	**0.649**
OA_1	0,779			

Construct	Loadings	Cronbach's alpha	CR	AVE
OA_2	0,857			
OA_3	0,699			
OA_4	0,841			
OA_5	0,789			
OA_6	0,857			
Digital transformation		**0.88**	**0.901**	**0.649**
DT_1	0,839			
DT_2	0,674			
DT_3	0,848			
DT_4	0,893			
DT_5	0,835			

Two processes were followed to examine the discriminant validity (DV). The first process was to ascertain each item's AVE square root in relation to other factors. When the AVE square root exceeds the corresponding correlations, the construct's discriminant validity is considered adequate. The research results confirmed that the construct's AVE square root exceeded the inter-construct correlation. The second process was to assess the discriminant validity by using the heterotrait-monotrait ratio of correlations (HTMT). Table 19 illustrates that all the constructs' discriminant validity was confirmed.

Table 19. Discriminant validity

Fornell-Larcker criterion	**DT**	**DTL**	**OA**
DT	0,821		
DTL	0,652	0,855	
OA	0,565	0,553	0,806
HTMT			
DT			
DTL	0,708		
OA	0,594	0,587	-

Prior to testing the structural model, it was tested for collinearity. The variance inflation factor (VIF) is used to measure collinearity. Preferably, VIF values should not exceed 5.0 or should not be below 0.20 to be acceptable (Hair et al., 2021). All the VIF values were lower than the numeric number five (5) but above 0.20, suggesting that there was no collinearity among the latent variables. Table 20 contains a summary of the results.

Common method variance is measured using the collinearity test, based on (Kock, 2015). Common method bias in PLS-SEM is examined by means of an algorithm test called “a full collinearity assessment approach.” Based on the results, common method bias was ruled out since the VIF for the latent variables was less than the numeric value 3 (Podsakof et al., 2003).

Table 20. Collinearity

	VIF
DTL -> DT	1,515
DTL -> OA	1,000
OA -> DT	1,443

4.4 CORRELATION ANALYSIS

Correlation statistics measure the extent to which two variables are strongly related to one another. Researchers are, however, cautioned not to conflate the presence of a correlation between two variables to imply causation (Aggarwal & Ranganathan, 2019). This section is a report on the examination of the relationship between DTL, OA, and DT. Spearman’s Rho correlation analysis tool was utilized for purposes of examining the relationship between the constructs. The summary of the results is provided in Table 21.

Table 21. Correlation of DTL, OA and DT

NON-PARAMETRIC CORRELATIONS					
CORRELATIONS			**DTL**	**OA**	**DT**
Spearman's rho	**DT LEADERSHIP**	Correlation Coefficient	--		
		Sig. (2-tailed)			
	OA	Correlation Coefficient	0.529**	--	
		Sig. (2-tailed)	<0.01		
	DT	Correlation Coefficient	0.640**	0.530**	1.00
		Sig. (2-tailed)	<0.01	<0.01	

**. Correlation is significant at the .01 level (2-tailed)

The relationship between DTL and OA was moderate at 0.529. Additionally, the relationship between OA and DT was found to be moderate at 0.530. However, the relationship between DTL and DT was found to be strongly moderate at 0.640. Overall, the results suggested a moderate but slightly better relationship between DTL and DT, and the relationships of DTL to OA and OA to DT were found to be moderate in nature.

4.5 STRUCTURAL MODEL – THE RELATIONS BETWEEN DTL, OA AND DT

The relations between DTL, OA, and DT are examined in this section. The suggested hypotheses were tested using PLS-SEM and SmartPLS. SEM is considered an appropriate method for data analysis when handling complex research models.

4.5.1 REGRESSION ANALYSIS

As stated in Chapter 3, SPSS and PLS SEM were used to conduct the regression analyses and correlation analyses in order to establish the relations between DTL, OA, and DT. Furthermore, the impact of DTL on OA was also examined. The results are shown in Table 24 below. Finally, the role of OA as a mediating factor between DTL and DT, using the PLS SEM and the results, is indicated in Table 22. Additionally, using SmartPLS, the suggested path model was developed based on the conceptual model and the research results, and is outlined in Figure 11. The results were examined in relation to hypotheses one and two:

Hypothesis 1: DTL positively impacts DT
Hypothesis 2: OA positively impacts DT

A goodness-of-fit examination was also performed. Thereafter, the degree of the mediation was also determined. Furthermore, the researcher used the substitution method to test the importance of each beta value by bootstrapping with 5000 samples.
Based on the results, DTL is a significant predictor of DT with $(\beta = .489, t = 5{,}628, p < 0.000)$ and OA is a significant predictor of DT with $(\beta = .294, t = 3{,}018, p < 0.000)$. Therefore, both hypotheses (H1 and H2) are supported.

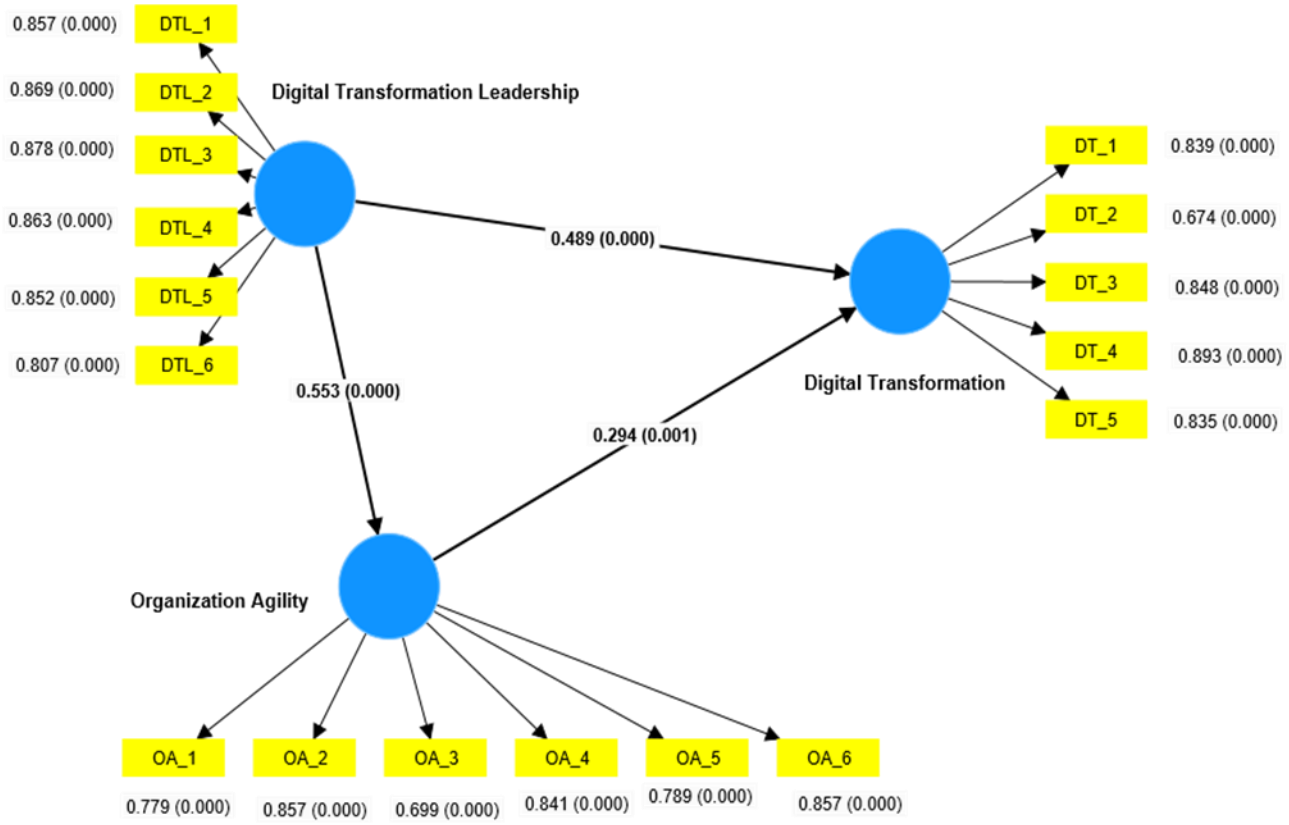

Figure 11. SmartPLS-developed PLS path model

A similar process was followed for hypotheses 3a and 3b:

Hypothesis 3a: Digital transformational leadership positively influences organizational agility

Firstly, a goodness-of-fit examination was also performed. Thereafter, the degree of the mediation was determined. Furthermore, the researcher used the substitution method to test the importance of the beta value by bootstrapping with 5,000 samples. The beta value was quite significant, as shown in Table 24. Based on the results, DTL is a significant predictor of OA ($\beta = .553,\ t = 8{,}493,\ p < 0.000$). DTL has a positive effect on OA. Therefore, hypothesis 3a is supported.

Mediating analysis

Hypothesis 3b: OA is a mediating factor in the relationship between DTL and DT

It is recommended that measurement of the secondary effect of a*b be tested first to establish the mediating effects in PLS (Zhao et al. 2010). Thereafter, the degree of the mediation should be determined. Using 5,000 subsamples and bias correction at 95% confidence intervals, the results were analysed by means of bootstrapping (Hair et al., 2016; Zhao et al., 2010).

The total effects were worthy of examination. They were in the affirmative and were conclusive based on the empirical results (β = .651, t = 10,854, p <.000). The primary relationship remained strong and conclusive ((β = .553, t = 8,493, p < .000). The secondary relationship remained arithmetically conclusive (β = .163, t = 3,088, p < .001). Therefore, a*b = .553*.294 = .1625 ~= .163. The indirect effect of β = .163 and a *p* value < 0.001 means the mediation effect is significant.

Additionally, none of the confidence intervals reflected zero values, as illustrated in Table 22. Given the significance of both the primary and secondary effects and both gravitating in the same direction, the results confirm a complementary mediation (Hair et al., 2021; Zhao et al., 2010). Consequently, the results validate the hypothesis H3b that OA mediates the relationship between DTL and DT.

Table 22. Mediating analysis

	Total effects		Direct effects		Indirect effects			
	β	t value	β	t value	Hypotheses	Coefficient	t value	p value
DTL -> DT	0,651	10,854	0,489	5,628	H3b:DTL -> OA -> DT	0,163	3,088	0,001

Using the regression equation y= b0 + b1x1 + b2x2, the model was tested using SPSS Version 3.4, where:
Y represents DT

b_o = is a constant

b_1 = is the DTL regression coefficient

X_1 = is the DTL variable

b_2 = is the OA regression coefficient

X_2 = is the OA variable

Table 23. Regression coefficient

Variable	Unstandardized coefficient	Std. error	Standardized coefficient	t-value	Sig.
Constant	1.318	.234		5,623	.00
1	.440	.067	.500	6,604	.00
2	.248	.071	.265	3,504	.00
Dependent variable = DT, Independent variable 1 = DTL, Independent variable 2 = OA					
Model Summary					
R	*R-squared*	*MSE*	*F*	*P*	
.678	.460	.351	55,826	.00	

Based on the results in Table 23 above, the calculation of the regression equation resulted in Y = 1.318 + .500 DTL + .265 OA. DTL and DT show a fairly strong relationship, with $\beta = .500$. The relationship between OA and DT is less strong, with $\beta = .265$. These results suggest that DTL is viewed as a better predictor of DT than OA. Moreover, with $R^2 = .460$, the model explains 46.0% of the variance; therefore, there is a linear relationship between DT, DTL, and OA with DTL and OA as predictors.

Table 24. Testing the hypotheses

Hypotheses testing	Relationship	β	Std Dev	*t* value	*p* value	Results
H1	DTL -> DT	0.489	0.087	5,628	0.000	Supported
H2	OA -> DT	0.294	0.097	3,018	0.000	Supported
H3a	DTL -> OA	0.553	0.065	8,493	0.001	Supported
H3b	DTL -> OA -> DT	0.163	0.053	3,088	0.001	Supported
- Dependent variable: DT - Independent variables: DTL Leadership and OA						

The beta values are quite significant, as shown in Table 24. Therefore, the results provide empirical evidence that the four hypotheses are well supported, in that DTL and OA positively impact DT, that DTL positively impacts OA, and finally, that OA positively mediates the relationship between DTL and DT.

4.6 SUMMARY

In this chapter, the results of several statistical tests are described. Firstly, the characteristics of the research participants in terms of gender, age group, management position, education level, and DT experience were indicated. In addition, to address the issue of possible data variability, the data was further disaggregated according to departmental business groups in order to distinguish the respondents from provincial offices from their head office counterparts. Secondly, the results of the descriptive analyses that were performed to illumine the general views of respondents on the role of DT and DTL on DT were described. Additionally, tests were performed to assess whether the data were normally distributed. Thirdly, the measurement model was tested for consistency and validity. Finally, regression analyses were performed to test the efficacy of the structural model for the presence of correlation among the constructs as well as to test the hypotheses.

Overall, the tests performed on the measurement and structural models were found to be both valid and reliable. The descriptive results showed a moderate to strongly moderate mean for each construct. Equally, the correlation analysis using Spearman's Rho (two-tailed) produced results that were largely the same. Additionally, the results showed a significant relationship between the independent variables and the dependable variable. Similarly, DTL was found to be a significant predictor of OA, just as OA was also found to mediate the relationship between DTL and DT.

Therefore, the results of this study reaffirmed the observations made in the study conducted in Cambodia by Ly (2023), which found DTL and OA to have a positive influence on the acceleration of DT initiatives. Additionally, the study also confirmed similar results observed in the United Arab Emirates by (AlNuaimi et al., 2022).

5 DISCUSSION OF THE FINDINGS

This chapter comprises a discussion of the research results in relation to the previously mentioned studies.

5.1 DISCUSSIONS OF RESULTS AND CONCLUSIONS

5.1.1 SUB-OBJECTIVE 1: THE INFLUENCE OF DIGITAL TRANSFORMATIONAL LEADERSHIP ON DIGITAL TRANSFORMATION

It was found that DTL was indeed a significant predictor of DT. Firstly, the correlation between DTL and DT was found to be positive at 0.640 (see Table 21). This implies that the more digitally capable the DTL is, the more likely it is that DTL will improve the success of the implementation of institutional DT initiatives. Secondly, the means for DTL and DT were recorded at 3.38 and 3.66, respectively, as per Table 16. Finally, the path coefficient value, which was high, ($\beta = .489$) and the *p* value, which was low, ($p < 0.000$), both affirmed the DTL-DT relationship to be statistically significant.

These results are consistent with similar observations made in the study conducted by (AlNuaimi et al., 2022). Both the high path coefficient value ($\beta = .282$) and the low *p* value ($p < 0.000$) affirmed the DTL-DT relationship to be statistically significant. The same results were observed in Ly's (2023) study, in which the high path coefficient value ($\beta = .353$) and the low *p* value ($p < 0.000$) also affirmed the DTL-DT relationship to be statistically significant.

Although the regression analysis results are significant, there were observations made in relation to correlation statistics. For example, one of the research items that scored the lowest mean was construct DTL2: "Leaders provide members with a clear DT vision." The second research item with the lowest mean, DTL5, states that "top leaders are not considering the DT beliefs of its members in implementing DT." These two research items are the bedrock of a digital transformation strategy. Therefore, top management should speed up the development of the digital transformation strategy, ensuring that the inputs of

employees are sought. They should also address any digital leadership skills deficiencies that might exist, in order to confidently drive the DT initiatives. Management should also put in place mechanisms to address any fears and concerns that employees may have about the digital change. Appropriate change management models should be utilized to address specific identified digital change challenges (Menon & Suresh, 2021; Porfírio et al., 2021).

The results affirm similar observations made in previous studies in which NIT was used as a framing lens, namely that a skilled DTL is well positioned to effect the required institutional change for an organization to be agile and adapt to the Industry 4.0 digital requirements (AlNuaimi et al., 2022; De Waal et al., 2016; Ly, 2023). Any institutional change, especially brought about by the advent of new technologies, can greatly benefit from DTL that encourages an organization to adopt digital norms and standards (Hinings et al., 2018). Therefore, organizations are more than likely to adapt and thrive in the digital age if they attract and retain leaders who are digitally perceptive (Porfírio et al., 2021).

The results, in totality, affirm similar observations made in previous studies (AlNuaimi et al., 2022; Ly, 2023) and support the hypothesis that DTL positively impacts DT.

5.1.2 SUB-OBJECTIVE 2: THE INFLUENCE OF AN AGILE ORGANIZATION ON DIGITAL TRANSFORMATION

It was empirically established that OA was a significant predictor of DT. Firstly, the correlation between OA and DT was found to be positive at 0.530 in Table 21. This implies that DT initiatives were more likely to succeed if the prevailing institutional arrangements were disrupted to make them more adept in the digital business era in order to foster and nurture innovation and a digital culture (Darvishmotevali et al., 2020; Li et al., 2021; Ly, 2023). By implication, new methods of working that include the increasing use of smart technologies and human capital with digital skills play a crucial role for organizations to be competitive in the Industry 4.0 era (Menon & Suresh, 2021). Secondly, the means for OA and DT were moderate at 3.46 and 3.66, respectively, as per Table 16. Finally, the path

coefficient value is high with $\beta = .294$ and the p-value is low with $p < 0.001$, and both affirm the OA-DT relationship to be statistically significant.

One of the research items that scored the lowest mean relates to OA4 ("We respond quickly to market and government changes."). This again might indicate the lack of a cohesive digital transformation strategy that emphasises the importance of OA in the digital business era. It is crucial that an organization disrupt its institutional arrangements, which include processes, systems, and policies and procedures, to be digitally agile and responsive to market needs (Darvishmotevali et al., 2020; Verhoef et al., 2021).

Interestingly enough, these results are consistent with similar observations made in the study conducted by AlNuaimi et al. (2022), in which the path coefficient value ($\beta = .233$) and the low *p* value ($p < 0.000$) both affirmed the OA-DT relationship to be statistically significant. Similar results were observed in the study conducted by Ly (2023), in which the high path coefficient value ($\beta = .259$) and the low *p* value ($p < 0.000$) also affirmed the OA-DT relationship to be statistically significant.

Overall, the results affirm similar observations made in previous studies (AlNuaimi et al., 2022; Ly, 2023) and support the hypothesis that OA positively impacts DT.

5.1.3 SUB-OBJECTIVE 3: THE INFLUENCE OF DIGITAL TRANSFORMATIONAL LEADERSHIP ON AN AGILE ORGANIZATION

The results indicated that DTL was a significant predictor of OA. Firstly, the correlation between DTL and OA was found to be positive at 0.529 (see Table 21). This implies that DTL is well positioned to turn a traditional business organization into one that is adept in the digital business era by effecting the necessary reforms in order to foster and nurture innovation and a digital culture. Secondly, the means for DTL and OA were moderate at 3.38 and 3.46, respectively, as per Table 16. Finally, the path coefficient value, which was high ($\beta = .553$) and the *p* value, which was low ($p < 0.001$), both affirmed the DTL-OA relationship to be statistically significant.

Encouragingly, these results are consistent with similar observations made in AlNuaimi et al.'s (2022) study, in which the high path coefficient value ($\beta = .638$) and the low *p* value

($p < 0.000$) both affirmed the DTL-OA relationship to be statistically significant. Similar results were observed in the study conducted by Ly (2023), in which the high path coefficient value ($\beta = .650$) and the low *p* value ($p < 0.000$) both also affirmed the DTL-OA relationship to be statistically significant.

Despite the significant regression analysis results, it is crucial that DTL capacity is developed to drive DT by reconfiguring the organization to be agile to address the needs of the digital customer, in line with the observations from the correlation statistics. This point was discussed in the preceding section, 5.1.1 above.

Overall, the results affirm similar observations made in previous studies AlNuaimi et al. (2022) and Ly (2023) and support the hypothesis that DTL positively impacts OA.

5.1.4 SUB-OBJECTIVE 4: THE INFLUENCE OF AN AGILE ORGANIZATION AS A MEDIATING FACTOR IN THE RELATIONSHIP BETWEEN DIGITAL TRANSFORMATIONAL LEADERSHIP AND DIGITAL TRANSFORMATION

The results demonstrated that OA was a significant mediator of the relationship between DTL and DT. In a seminal study conducted by Zhao et al. (2010), the authors recommended that in calculating an indirect effect, one should first consider the effect of a* b. This observation was affirmed in Ly's (2023) study. Based on the guidance provided by Zhao et al. (2010), the calculation of the indirect effect was as follows:
a = Digital Transformation Leadership -> Organizational Agility = .553
b = Organizational Agility -> Digital Transformation = .294

Therefore a*b = .553*.294 = .1625 ~= .163, which confirms that the mediating effect of OA on DTL and DT is significant based on the path coefficient of .163, and the *p* value of 0.001.

The results for the mediating factor were also consistent with similar observations made in the study conducted by AlNuaimi et al. (2022), in which the high path coefficient value ($\beta = .149$) and the low *p* value ($p < 0.000$) both affirmed the DTL-OA-DT relationship to be statistically significant. Similar results were observed in the study conducted by Ly (2023),

in which the high path coefficient value ($\beta = .168$) and the low *p* value ($p < 0.000$) both also affirmed the DTL-OA-DT relationship to be statistically significant.

One of the research items that scored the lowest mean relates to the digitization process (Ghobakhloo, 2020). Therefore, top management should address the perceived view that digitalization is not an organization-wide priority because the lowest mean was recorded for DT1 ("My organization strives to digitalize everything possible.") with a mean of 3.41 and a standard deviation of 1.071. Digitization and digitalization should be part of a comprehensive digital strategy because the strategy will identify and prioritize key initiatives based on available resources (Armstrong & Lee, 2022).

Overall, the results affirm similar observations made in previous studies (AlNuaimi et al., 2022; Ly, 2023) and support the hypothesis that OA positively mediates the relationship between DTL and DT.

Furthermore, descriptive analysis based on disaggregated data was done in order to identify any observed data variability in the respondents' feedback between the head office and provincial offices. Several observations arose in the disaggregated data in relation to the public communication service offerings and the location of staff members. Firstly, officials from provincial offices collectively recorded the highest mean for all the constructs, with DT at 3.99, DTL at 3.73, and OA at 3.70. Interestingly enough, the head office core staff members recorded the lowest means across the three conceptual elements, with DT at 3.44, DTL at 3.23, and OA at 3.23. The results might be a reflection that provincial offices are willing to experiment and adopt innovative digital communication technologies a lot more than their head office counterparts. This practice may have commenced during the COVID-19 pandemic lockdown, when public engagements and awareness programmes in far-flung rural and peri-urban areas were shifted from physical to digital platforms, and might have remained in force even after COVID-19 lockdown (Presidency of South Africa, 2021). Nevertheless, the provincial offices' results are encouraging, and top management could utilize them as a foundation to initiate organization-wide DT initiatives.

The measurement model was tested for reliability and validity, a crucial factor in ensuring the quality of the research output. The results for Cronbach's alpha, AVE, and CR were acceptable. The results for the outer loadings of items OA3 and DT2, as per Table 18, were below the acceptable norm of .70. However, the AVE values for the variables were healthy at .649, well above the acceptable norm of .50. Therefore, the two items or measures were retained in line with the recommendations by (Gaskin, 2017; Hair et al., 2021).

Finally, the structural model, as outlined in Chapter 3, was also tested for any relations between the latent variables. The relationship between the latent variables was found to be significant, which means the variation in one latent variable affected the other. The results were outlined and briefly discussed in the previous chapter, as summarised in Table 22 and 24.

The results from the tests performed on the measurement and structural models affirm the similar findings in studies conducted by (AlNuaimi et al., 2022; Ly, 2023).

5.2 CONCLUSION TO FINDINGS AND RESULTS

This study investigated the role of DT within the public sector communication service in South Africa, focusing on GCIS. The results from the study have confirmed the crucial role of DTL and DT in helping successfully implement DT in the public sector, especially the regression analyses performed to assess the influence of DTL and OA on DT, DT on OA, and OA as a mediating factor in the relationship between DTL and DT. All the regression analysis results were significant. However, the correlation analysis results were moderate.

6 CONCLUSION

Having discussed the research findings in Chapter 5, in this chapter, the research questions are answered and practical recommendations are made. The limitations of the study are then indicated, and recommendations for future research are provided. Lastly, the contributions of the current study are outlined.

DT initiatives cannot succeed without digitally perceptive and capable leadership. DT is also a complex phenomenon, requiring leaders to foster experimentation and adaptation, as well as engender an innovation culture. However, success is realized when the required dynamic digital capabilities are developed for the customer and a market-responsive, agile organization is established. Therefore, OA becomes an enabler for DTL to effect the necessary DT initiatives for the organization to be nimble in exploiting opportunities in the market by leveraging innovative digital technologies to survive and thrive. Ultimately, we come to appreciate the intricate and often interwoven relationship of the OA, DTL, and DT. The three constructs enable us, through the NIT framing lens, to understand their mutual coexistence, without which the digital transformation of organizations could not successfully be legitimized.

Therefore, it is suggested that a DT improvement plan be developed and implemented within the public sector communication service organization chosen for this study to address the observations arising from this study, especially in relation to the correlation statistics, where several concerns were raised. The overall average mean for all constructs points to the need to address impediments to the implementation of DT initiatives. When the improvement plan is developed, adequately resourced, implemented, and monitored, and corrective actions taken, this will result in accelerated adoption and marked improvement of the DT outcomes.

All hypotheses as outlined in the research methodology were examined, and the results were found to be in the affirmative. Discussions of the research results revealed empirically the intricate and interwoven nature of these three variables. The relationship among the constructs is significant and such that none exists without the others if the implementation of DT initiatives is to gain traction on a larger scale.

6.1 ANSWERS TO THE RESEARCH QUESTIONS

6.1.1 DOES DIGITAL TRANSFORMATIONAL LEADERSHIP POSITIVELY INFLUENCE DIGITAL TRANSFORMATION?

The research findings affirmed the empirical model developed and tested by Ly (2023), now applied within the context of the South African public sector communication service. This study further affirms the research findings observed in the study conducted by (AlNuaimi et al., 2022). Firstly, the results reaffirm that there is a linear relationship between DTL and DT and, secondly, that DTL is a significant predictor of DT. In the context of DT, these results confirm that DTL is best suited to overseeing organizational transition and reaffirm the literature on the use of NIT to investigate DT. Transformation leaders who are digitally perceptive are able to deinstitutionalize traditional business practices and institutionalize the required values and beliefs to steer the organization towards the required digital change.

6.1.2 DOES ORGANIZATIONAL AGILITY POSITIVELY INFLUENCE DIGITAL TRANSFORMATION?

This study has confirmed and empirically supported the hypothesis that OA positively impacts DT. Significantly, the study has helped build a solid case to support the existing limited body of literature by Ly (2023) and AlNuaimi et al. (2022) that also observed similar results in Cambodia and the United Arab Emirates, respectively. Consequently, public sector communication service organizations can benefit from the reconfiguration of their well-established institutional arrangements to be digitally perceptive in order to successfully implement DT initiatives.

6.1.3 DOES DIGITAL TRANSFORMATIONAL LEADERSHIP POSITIVELY INFLUENCE ORGANIZATIONAL AGILITY?

The research results have confirmed that DTL positively impacts OA. Consequently, the results support the hypothesis that DTL has a positive impact on OA. Equally importantly, the results support the studies by Ly (2023) and AlNuaimi et al. (2022) that investigated the role of DTL on OA and attained the same results as this study. DT is a complex dilemma,

requiring the right DTL to digitally transform the organization to be agile in the face of the demands of the digital business era.

6.1.4 *DOES ORGANIZATIONAL AGILITY PLAY A MEDIATING ROLE IN THE RELATIONSHIP BETWEEN DIGITAL TRANSFORMATION LEADERSHIP AND DIGITAL TRANSFORMATION?*

The research findings confirm the hypothesis that OA mediates the relationship between DTL and DT. They are also consistent with the studies conducted by Ly (2023) and AlNuaimi et al. (2022), in which the authors reached the same conclusion on the positive mediating role of OA on DTL and DT. The findings further affirm that the public sector communication service organization in South Africa should focus on improving OA because DTL alone will not result in DT efforts being realized. Therefore, OA and DTL are intricately interwoven to such an extent that one cannot exist without the other if DT efforts are to be successful. De-institutionalization of traditional organizational structures and other institutional set-ups to make way for new structural forms and organizational settings will result in effective DT that creates stakeholder value and sustainable organizations in a cutthroat competitive market environment. Therefore, the study of the interaction of DTL and DT would be incomplete without understanding the crucial role that OA plays as a mediating factor.

The answers to the above sub-questions make it possible to answer the primary research question.

6.1.5 *WHAT IS THE INFLUENCE OF DIGITAL TRANSFORMATIONAL LEADERSHIP AND ORGANIZATIONAL AGILITY ON DIGITAL TRANSFORMATION WITHIN THE PUBLIC SECTOR COMMUNICATION SERVICE IN SOUTH AFRICA?*

Firstly, this study has confirmed with empirical evidence that DTL positively influences DT. Secondly, the study has demonstrated empirically that OA positively influences DT. Thirdly, the role of DTL in positively influencing OA has been confirmed. Fourthly, the results have affirmed the role of OA as a positive mediator in the interplay of DTL and DT.

Therefore, it is possible to confirm that DTL and OA have an immense impact on DT. This means that it is imperative that these elements, especially DTL, be in place for any DT initiative to be successful within the public sector communication service in South Africa.

6.2 RECOMMENDATIONS

6.2.1 DIGITAL TRANSFORMATIONAL LEADERSHIP

Organizations that strive to compete and thrive in the digital age should attract and retain digital transformative leaders who are able to steer their organizations towards the Industry 4.0 era (Porfírio et al., 2021). In instances where DTL skills do not exist internally, the organization should invest in its leaders by enrolling them in executive DTL programmes.

The above measures will address the observation made in research item DTL2 that “leaders provide members with a clear DT vision) at 3.25 and a standard deviation of 1.100.”

It is essential to make funding available to address employees’ DT training needs, especially prioritizing the development of digital and digital leadership skills among top, senior, middle, and junior directors. For example, government using its buying power and influence, could design a multi-sided digital training platform or leverage existing platforms to provide digital skills to public sector communication service employees, the broader public and private sector, and the general community (Fitriani et al., 2023).

This intervention will address the perceived view in research item DTL5 that “top leaders are not considering the DT beliefs of its members in implementing DT.” Appropriate change management methodologies tailor-made for the situation at hand should be adopted to support members of management who might still feel unsure about their future as the organization is transformed towards implementing DT organization-wide (Musaigwa & Kalitanyi, 2023).

6.2.2 ORGANIZATIONAL AGILITY

The results confirm that OA has a linear relationship with and is a significant predictor of DT. Therefore, organizations are more than likely to derive value by building the requisite OA capacity (Li et al., 2021). An organization can adapt its policies and procedures, leadership capacity, systems, and organizational structure to become agile and responsive in the digital business era (Darvishmotevali et al., 2020; Teichert, 2019). It is a suitable approach to foster the new culture and practices required to implement DT. This would require that the organization cultivate and promote a learning culture rooted in knowledge management to ensure the success of DT efforts (Menon & Suresh, 2021; Walsh, 1995). Furthermore, Menon and Suresh (2021) suggested that organizations should adopt agile methodologies and human capital practices to be competitive in the digital business era.

Top management should reconfigure the organization to respond swiftly to market and government changes, to address the perception in research item OA4 that “We respond quickly to market and government changes.” which had the lowest mean of 3.32 and standard deviation of 1.180. An organization that is slow to respond to exogenous factors affecting its corporate strategy might fail to adapt and will not thrive. Flexibility and adaptability occur through the adoption of agile methods and established agile teams to exploit opportunities to address customers’ pain points, experiment, and learn (Wong & van Gils, 2022). In addition, agility occurs when ideation leads to new or improved products and services that meet or exceed customers’ expectations (Kwakernaak, 2019). Scrum methodologies (to promote team self-management enabled by digital technologies, learning culture, and adaptability) and the lean methodologies (to improve information visibility and team performance through continuous improvement) are some of the tools and techniques to enhance organization agility. Agility in a public sector communication service organization also manifests itself through flat and networked structures rather than hierarchical and functional structures. It is also characterized by distributed leadership and devolving decision-making to employees located at crucial customer contact points (Dühring & Zerfass, 2021).

DTL should foster a digital innovation culture (Ibrahimi & Benchekroun, 2023). This is achieved by promoting employee innovation, experimentation and tolerance of errors (fail-fast culture), ensuring employees' psychological safety, and ensuring distributed leadership and connected teams for shared learnings and knowledge management, as the organizations navigate the uncharted territories (Kiron & Spindel, 2019; Sia et al., 2021).

Public sector communication service organizations should review and put in place public sector communication service laws, regulations, and internal policies and procedures that foster a DT culture. These digitally-oriented prescripts should also address cybersecurity, data privacy, and issues of digital ethics in transacting on digital platforms, a proposition that is also supported by (Illia, 2023).

Public sector communication service organizations should also promote collaboration among themselves in order to ensure there is cross-pollination of insights arising from big data and big data analytics (Guo et al.,2023). This will promote knowledge sharing and inter-departmental learning, thus accelerating greater adoption of innovative digital technologies across the public sector. During the COVID-19 crisis, for example, public sector organizations worked closely together with their private sector counterparts to tackle the pandemic (Presidency of South Africa, 2021). This resulted in novel behavioural patterns referred to as the "MAR" (motivation, agility, and resistance) factors because all key stakeholders rallied to find solutions to a common threat.

Public sector organizations exist to fulfil the needs of the public. As digitization and digitalization unfold, it is crucial that there is community involvement in the redesign of prescripts and the design of digital innovative technologies that disintermediate traditional platforms previously used to deliver public sector services. If public sector organizations do not seek input from the community, DT initiatives are likely to fail due to non-compliance with constitutional precepts. For example, in a comparative study conducted in the rural settings of the USA and Romania, Vlad et al. (2023) found that the government could enhance community engagement and civic education by using visuals such as generating and posting digital videos on digital platforms to enable citizens to engage more with government policies and programmes. Citizens found that engagements in traditional

community and town hall settings were not as effective because they were competing with citizens' other chores, resulting in lower participation.

DT is a complex phenomenon with multiple dilemmas. To succeed, DTL should embrace a consultative style of leadership to gain the support of employees and other important stakeholders. Through these constructive engagements, identifying areas of commonality would result in consensus being reached, resulting in many of the DT initiatives proposed by management being successfully implemented.

Significantly investing in new digital infrastructure is crucial for the acceleration of DT. Digitization and digitalization would result in high and varying amounts of data being collected. Consequently, public sector communication service organizations should invest in technologies such as cloud computing, data analytics, RPA, and IOTs to improve the velocity with which data is collated, analysed, and insights extracted to improve decision-making and business performance.

6.2.3 DIGITAL TRANSFORMATION

Top management should address the perceived view that digitalization is not an organization-wide priority, as the lowest mean was recorded for DT1 on the research item that states that "My organization strives to digitalize everything possible." Not all business value-adding activities are repetitive in nature, requiring digitalization. Therefore, the assessment of key value-chain activities informed by customer requirements is crucial, to identify activities that can be optimised through digitalization to improve end-to-end demand and supply chain visibility, and eliminate waste (Van Mieghem & Boute, 2019). Equally, the institutionalization of DT requires digital leaders who will ensure distributed leadership and decision-making, connected teams, promote risk-driven innovation and error tolerance, and build and sustain innovation hubs (Höyng & Lau, 2023; Wanasida et al., 2020).

As previously stated, skilled DTL can positively influence the success of DT. However, DT cannot succeed without the DTL fostering the required OA by leveraging endogenous dynamic capabilities to sense and seize opportunities and counter the threats, brought about by government and market changes, in order to survive and thrive. This means that process

mapping and analyses of all key value-chain activities anchored on the needs of customers are essential, in order to identify activities that can be optimised through digitalization to improve end-to-end supply chain visibility and eliminate waste (Van Mieghem & Boute, 2019).

Public sector organizations exist within a highly regulated and politicised environment with well-entrenched institutional arrangements. The development of the DT strategy should involve all key stakeholders: regulators, professional bodies, organized civil society formations, clients, and employees. This will help attract the required resources to implement the strategy and mitigate against any form of resistance. More importantly, it is necessary to ensure that there is technology alignment between the organization and those with whom it has direct and indirect dealings. As stated previously, DT does not replace the corporate strategy, annual performance plans, or annual operational plans. DT strategy seeks to leverage these innovative technologies in order to grow business performance exponentially over time (Ade Irma Stefi Ulil, 2021; John et al., 2022).

6.3 LIMITATIONS

Limitations are inherent factors that affect almost all research studies, especially a study such as this that is undertaken within constraints such as time and money. First, the research results might not be generalizable to other public sector organizations. Similarly, the results might not necessarily apply to other African countries and the rest of the world, given the limited sample size. Secondly, and finally, the researcher would have adopted a mixed-methods approach were it not for the constraints of time and budget. A mixed-methods study would have enabled the researcher to delve more qualitatively into the respondents' feedback, which might have contributed towards the enhancement of the conceptual model. Equally, such an approach would have enriched future studies, especially in areas in which the means for the constructs were below the Likert scale of 4.

The limitations that affect this study open opportunities for further research studies, especially cross-country, longitudinal, and mixed-method research studies.

6.4 SUGGESTIONS FOR FUTURE RESEARCH

Firstly, considering that this study was confined to the public sector communication service in South Africa, with a small sample size, it is recommended that similar studies be conducted on a larger sample in the future. This study could benefit from an in-depth qualitative study to understand the nuanced views of the participants on the various elements tested during this quantitative study, especially in areas where the mean scores were lower.

Secondly, although organizations might operate within the same industry or sector, their modes of operation often differ. Therefore, similar quantitative studies using the same instrument across multi-disciplinary public sector organizations and perhaps, private sector organizations could also reveal the extent to which organizations embrace and accelerate DT with DTL and OA as enablers.

Thirdly, a mixed-methods study combining both quantitative and qualitative methods might be more appropriate to illuminate the extent of DTL and OA in DT acceleration, as well as understand the enablers and impediments. This could reveal other enabling levers to help accelerate the adoption of DT in government and private sector organizations.

Lastly, and most crucially, very little is known about the effects of deinstitutionalizing well-established and legitimized practices within public sector organizations in order to foster digital practices and how this impacts organizational behaviour over time. Therefore, a longitudinal study that investigates organizational behaviour during the DT process provides a further research opportunity, especially in the application of NIT and its effect on DT post-COVID-19 pandemic era.

6.5 CONTRIBUTIONS OF THE STUDY

The study has made several contributions:

6.5.1 SIGNIFICANCE OF THE STUDY IN RELATION TO PRACTICE

Firstly, within a South African public sector communication service context, the study establishes the role of DTL and OA in DT acceleration, including the mediating role of OA on DTL and DT. Equally, successfully orchestrating DT initiatives requires digitally-perceptive leadership that enjoys the support of internal and external stakeholders to reconfigure an organization or institution to be digitally flexible and adaptable to survive and thrive in the digital economy.

Secondly, in the context of NIT, DT has a huge impact on organizational orientation and adaptation. It requires organizations to either possess dynamic digital capabilities or develop the requisite digital skills in order to cope with the coercive externalised factors brought to bear on organizational actors and the organizations themselves. Given well-established institutional prescripts and practices within public sector organizations, these external changes might not be that easily accepted and implemented, leading to the failure of DT. DT is more than likely to succeed when the DTL fosters, by means of institutionalization, the required psychological safety of employees and builds digitally capable teams to bring about the much-needed DT agenda. Additionally, implementing reforms in terms of modifying existing policies and procedures to enable OA will create a conducive environment for DT to be successful. Public sector organizations should focus on streamlining their processes and workflows and remove impediments if DT is to be successful. In the context of DT, new organizational measures to help foster a culture of innovation will succeed if the process of developing organizational digital strategies involves lower-level employees rather than the top leaders imposing a top-down approach.

Thirdly, this study will specifically benefit the chosen public communication organization in its DT journey towards the development of a DT strategy and achieving the desired level of digital maturity. This study advances a business case for the application of NIT in the diffusion of DT initiatives within rule-based institutions, such as those in the banking and

mining sectors, in addition to public sector organizations, emphasising the role of DTL and OA as crucial enablers. Through the collection of primary research data to test the hypotheses based on the theoretical and conceptual framework, this study provides rich insights that can serve as a framework for the rollout of DT initiatives. The framework will also serve as a guide for the institutional arrangements required to adopt new innovative technologies within varying industries, rooted in an understanding of the crucial factors for DT acceleration. The study also presents a well-researched argument for organizations to build the requisite DTL skills to reconfigure structures, systems, policies and procedures and for institutions to recruit and retain digitally skilled employees who can accelerate DT within a renewed innovation and digital culture.

Finally, this study builds on the few studies conducted on the application of NIT to explore the DT phenomenon. With limited understanding within and outside public sector organizations of ways to exploit the DT technologies post-Covid-19 to accelerate change, improve performance to survive and thrive, this study improves our understanding and appreciation of how endogenous factors such as DTL and OA could improve the acceleration of DT.

6.5.2 SIGNIFICANCE OF THE STUDY IN RELATION TO THEORY

Firstly, the review of relevant literature provides a holistic and unified view of existing studies on DT acceleration initiatives, particularly in relation to the context of the public sector communication service in South Africa. The study illuminates the impact of DTL and OA on DT, thereby adding to the existing but limited studies in which these phenomena were investigated. This study also comprises a response to the call for further research using NIT on the impact of OA on DT and the resultant effect on organizational arrangements (AlNuaimi et al., 2021; Dubey et al., 2019; Ly, 2023). It has thus shed further light on the positive effect of OA on DT and the extent to which OA plays a mediating role in the interplay of DTL and DT. Studies conducted in the past on OA and DT mostly, have been explorative in nature according to Al Humdan et al. (2020) and Shashi et al. (2020) or examined resources and dynamic capabilities within organizations according to Li et al. (2021) and Zhu et al. (2022), as well as at ICT competencies according to Pattij et al. (2020), or elasticity

according to Alghamdi & Agag (2023), and finally, corporate entrepreneurship and innovation according to (Darvishmotevali et al., 2020).

Secondly, the study sheds further light on the role of DTL in the interplay of OA and DT and contributes to the scant literature on this topic. Despite the shortcomings of NIT as a framing lens, there are huge benefits to investigating the role of DTL and OA as intricately intertwined and interwoven dilemmas affecting the implementation of DT within government organizations. DT challenges institutions to reform. Theoretically, the study advances the benefit of NIT as an appropriate framing lens to orient the diffusion of innovative technologies, especially in developing nations that have varying institutional governance arrangements. The methodology adopted and applied in this study should assist future researchers who seek to investigate DT as an institutional change.

Thirdly, the study contributes to the scant body of literature on the role of DTL in the interaction of OA and DT as pointed out according to (AlNuaimi et al., 2022; Ly, 2023). There are ample studies in which the impact of DTL on OA has been investigated according to Wanasida et al. (2020), in light of the limited literature on the role of DTL in DT as articulated by (Porfírio et al., 2021).

Fourthly, the role of DTL as a trigger for OA in DT is yet to be fully explored, according to (AlNuaimi et al., 2022; Ly, 2023). This study is among a few that have attempted to add to the current limited empirical studies.

Fifthly, the mediating role of OA on DTL and DT is also yet to be fully explored, as shown in studies by (AlNuaimi et al., 2022; Ly, 2023).

Finally and ultimately, this study contributes to the growing pattern of studies undertaken in public sector organizations to understand how digital leaders can implement strategic and innovative changes in pursuit of a defined organizational purpose. Often, leaders have to navigate unchartered paths to secure consensus in order to effect the required changes within well-established institutions in the face of many competing interests that are sometimes difficult to reconcile.

As organizations grapple with finding success formulae for implementing DT initiatives, this study strengthens the credibility of the NIT framing lens as an appropriate theory to study organizational behaviour during DT implementation.

6.6 CONCLUSION

This study has achieved its intended research objectives. It has been established empirically within the public sector communication service in South Africa that DTL and OA are crucial levers to accelerate DT initiatives. The study has also shed light on the role of DTL on OA in the implementation of DT initiatives. Furthermore, the study confirmed that the mediating role of OA on DTL and DT was significant. Ultimately, public sector organizations are likely to accelerate DT initiatives if they prioritize the development of the required DTL capabilities. As the research results have shown, digitally-perceptive leadership is able to work with key stakeholders to garner the necessary support to effect the institutional reforms required for DT initiatives to succeed. Therefore, simply investing in the new digital and innovative technologies without the requisite visionary DTL that fosters a digital and innovative organizational culture and practices would amount to nothing more than ‘the sunk costs fallacy’.

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ANNEXURE A - RESEARCH INSTRUMENT

Cover page

Dear Respondent,

My name is Dalson Modiba, and I am a master's student in Digital Business at the University of Witwatersrand, Johannesburg, under the supervision of Dr Tebogo Sethibe.

I am researching "Digital Transformation within the public sector communication service in South Africa". I invite you to participate in a 10-minute survey.

Digital transformation is defined as the acceleration of business activities, processes, competencies and models to fully leverage the changes and opportunities of digital technologies and their impact in a more strategic and prioritized approach. Ways in which digital transformation can manifest itself in an organisation include: (i) investing in cloud-based technologies for big data collection and big data analytics, (ii) digitalization of key business processes and also merging key business applications to enable end-to-end view of the value-creation chains, (iii) posting on social media accounts aimed at targeted audience and monitoring social media conversations, (iv) tracking website traffic, and (v) analyzing online engagements to gain insights into the organisation target audience's behaviour and preferences.

The survey does not require your name or any other personal details, and your participation is voluntary. All information you provide will be treated as confidential and stored securely. Your responses will only be accessible to the research team and will not be shared with third parties.

You are under no obligation to answer any questions that you do not wish to respond to, and there are no direct benefits associated with participating in this research study.

To commence the survey, please choose "Yes, I consent", which indicates you have read and understood the above information.

Conversely, if you opt not to participate in the survey, please select "No, I do not consent" and you will be exited from the survey.

Thank you, Dalson Modiba

Block 4

Consent

Consent

- ◯ Yes I consent
- ◯ No I do not consent

Section A: Demographics

Section A: Demographics

Please indicate your age group:

- ◯ 18-25 years old
- ◯ 26-35 years old
- ◯ 36-45 years old
- ◯ 46-55 years old
- ◯ 56+ years old

Please indicate your gender:

- ◯ Male
- ◯ Female
- ◯ Non-binary / third gender
- ◯ Prefer not to say

Please indicate years of experience implementing Digital Transformation (DT):

- ◯ Less than 1 year
- ◯ 1 to 2 years
- ◯ 3 to 5 years
- ◯ 6 to 10 years
- ◯ 11 to 15 years
- ◯ 16 to 20 years
- ◯ >20 years

Please indicate your position in the organisation:

- ◯ MANCO member
- ◯ Director
- ◯ Deputy Director
- ◯ Assistant Director

Please indicate your highest qualification

- ◯ Matric
- ◯ Diploma/University Degree
- ◯ Honours
- ◯ Masters
- ◯ Doctorate
- ◯ Other (please specify)

Please indicate the business unit you belong to:

- ◯ Products and Platforms

- Entity Oversight
- Policy and Research
- Media Policy
- Provincial and Local Liaison H/O
- Provincial Office Gauteng
- Provincial Office North West
- Provincial Office Northern Cape
- Provincial Office Limpopo
- Provincial Office Mpumalanga
- Provincial Office Kwa-Zulu Natal
- Provincial Office Eastern Cape
- Provincial Office Western Cape
- Provincial Office Free State
- Economic Communications Cluster
- Social Communications Cluster
- Communication Service Agency
- Information Management & Technology
- Human Resources
- Chief Financial Officer
- Internal Audit

Section B

Section B: Digital Transformational Leadership
In this section, the aim is to explore your perspective on the role of digital transformational leadership on digital transformation in the public communication service.

To what extent do you agree or disagree with the following statement(s):

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Leaders inspire all members with the Digital Transformation (DT) plans for our organization	○	○	○	○	○
Leaders provide members with a clear DT vision	○	○	○	○	○
Leaders motivate team members to accomplish the same DT goals	○	○	○	○	○
Leaders in our organization encourage all members to reach DT goals	○	○	○	○	○
Leaders in my organization consider the DT beliefs (mindsets) of all members	○	○	○	○	○
Leaders encourage all members to think about DT ideas	○	○	○	○	○

Section C: Organizational Agility
In this section, the aim is to explore your perspective on the role of organizational agility on digital transformation in the public communication service.

To what extent do you agree or disagree with the following statement(s):

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
We can quickly accommodate individual and government needs	○	○	○	○	○
We can rapidly adapt processes and activities to meet demand fluctuations	○	○	○	○	○
We can handle issues from suppliers and partners efficiently	○	○	○	○	○
We respond quickly to market and government changes	○	○	○	○	○
We seek ways to reinvent our organization continually	○	○	○	○	○
We see government and market trends that provide for speedy expansion	○	○	○	○	○

Section D: Digital Transformation
In this section, the aim is to explore your perspective on the role of digital transformation in the delivery of public communication service.

To what extent do you agree or disagree with the following statement(s):

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My organization strives to digitalize everything possible	○	○	○	○	○
My organization collects vast amounts of data from several sources	○	○	○	○	○
My organization aspires to use digital technologies for additional activities	○	○	○	○	○
My organization strives to use digital technology to improve service quality	○	○	○	○	○
My organization strives towards digital information sharing	○	○	○	○	○

ANNEXURE B - COVERING LETTER

Cover page

Dear Respondent,

My name is Dalson Modiba, and I am a master's student in Digital Business at the University of Witwatersrand, Johannesburg, under the supervision of Dr Tebogo Sethibe.

I am researching "Digital Transformation within the public sector communication service in South Africa". I invite you to participate in a 10-minute survey.

Digital transformation is defined as the acceleration of business activities, processes, competencies and models to fully leverage the changes and opportunities of digital technologies and their impact in a more strategic and prioritized approach. Ways in which digital transformation can manifest itself in an organisation include: (i) investing in cloud-based technologies for big data collection and big data analytics, (ii) digitalization of key business processes and also merging key business applications to enable end-to-end view of the value-creation chains, (iii) posting on social media accounts aimed at targeted audience and monitoring social media conversations, (iv) tracking website traffic, and (v) analyzing online engagements to gain insights into the organisation target audience's behaviour and preferences.

The survey does not require your name or any other personal details, and your participation is voluntary. All information you provide will be treated as confidential and stored securely. Your responses will only be accessible to the research team and will not be shared with third parties.

You are under no obligation to answer any questions that you do not wish to respond to, and there are no direct benefits associated with participating in this research study.

To commence the survey, please choose "Yes, I consent", which indicates you have read and understood the above information.

Conversely, if you opt not to participate in the survey, please select "No, I do not consent" and you will be exited from the survey.

Thank you, Dalson Modiba

Block 4

Consent

Consent

- ◯ Yes I consent
- ◯ No I do not consent

Section A: Demographics

Section A: Demographics

Please indicate your age group:

- ◯ 18-25 years old

ANNEXURE C - TITLE APPROVAL (PAG)

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Private Bag 3 Wits, 2050
Fax:
Tel:

Reference: Ms Jennifer Mgolodela
E-mail: jennifer.mgolodela@wits.ac.za

30 January 2024
Person No: 0010909W
PAG

Mr DN Modiba
PO Box 100095
Moreleta Plaza
0167
South Africa

Dear Mr Dalson Modiba

Master of Management: Approval of Title

We have pleasure in advising that your proposal entitled *Digital transformation within the public sector communication service in South Africa*. has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Marike Bosman
Faculty Registrar
Faculty of Commerce, Law and Management

ANNEXURE D - ETHICS CERTIFICATE

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School

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

Ethics Clearance Certificate

Ethics protocol number: WBS/DB0010909w/420
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below)

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	Digital transformation within the public sector communication service in South Africa.
Investigator / Researcher	Mr Dalson Nkoana Modiba
Nature of Project	MM (Digital Business)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2023/10/02
Expiry date	Date of submission of the project / research report
Chairperson	Dr Pius Oba ☎ +27 11 717 3976 +27 82 733 6587 ✉ pius.oba@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.

DN MODIBA — Signature

04/10/2023 — Date:

ANNEXURE E - INSTITUTION LETTER OF PERMISSION

The Graduate School of Business Administration
2 St David's Place,
Parktown, Johannesburg,
2193, South Africa
PO Box 98, WITS, 2050
Telephone: +27 11 717 3145
Website: www.wbs.ac.za

The Director-General (Acting)
Government Communication and Information System (GCIS)
1035 Francis Baard Street
Tshedimosetso House
Hatfield, Pretoria
0002

October 2023

FULL-TIME COHORT: RESEARCH STUDY IN PARTIAL FULFILMENT OF THE MASTERS DEGREE IN DIGITAL BUSINESS 2023

Dear Ms Mnukwa,

Please be made aware that Dalson Nkoana Modiba (Student no: 0010909w), a GCIS employee, is enrolled for the Masters of Management in Digital Business with the University of the Witwatersrand, within the Wits Business School.

His research focus area is: "**Digital Transformation within the public sector communication service in South Africa**".

It would be highly appreciated if you could be so kind enough to allow him to carry out the above-mentioned quantitative research study within GCIS.

The study is strictly for academic purposes. The corporate information of the organisation (not for public consumption) and the personal details of the employees will be kept confidential for purposes of carrying out the study.

I have attached for easy reference, the GCIS template signed by my supervisor, Mr. Terry Vandayar (DDG: Corporate Services – Acting) as well as myself, for your attention and consideration. I have also attached the Ethics Approval Certificate from Wits University.

Many thanks in advance for your cooperation in this regard.



Dalson Modiba

Chief Audit Executive

Date: 03 OCTOBER 2023

ANNEXURE F - TURN-IT IN REPORT

Final_version_research_report_DN_Modiba_28032024.docx

ORIGINALITY REPORT

5%	6%	5%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.ncbi.nlm.nih.gov Internet Source	2%
2	wiredspace.wits.ac.za Internet Source	2%
3	discovery.dundee.ac.uk Internet Source	1%
4	pearl.plymouth.ac.uk Internet Source	1%
5	hdl.handle.net Internet Source	<1%

Exclude quotes	On	Exclude matches	< 50 words
Exclude bibliography	On		

ANNEXURE G - ASSESSING THE MEASUREMENT MODEL

Table 1 Factor loadings, reliability, and validity

Constructs	Loadings
Digital transformational leadership (DTL) (Cronbach's alpha = 0.886, CR = 0.913, AVE = 0.637)	
DTL1-Leaders inspire all members with the DT plans for our organization	0.783
DTL2-Leaders provide members with a clear DT vision	0.768
DTL3-Leaders motivate team members to accomplish the same DT goals	0.803
DTL4-Leaders in our organization encourages all members to reach DT goals	0.821
DTL5-Leaders in my organization consider the DT beliefs of all members	0.742
DTL6-Leaders encourage all members to think about DT ideas	0.865
Organizational agility (OA) (Cronbach's alpha = 0.898, CR = 0.922, AVE = 0.663)	
OA1-We can quickly accommodate individual and government needs	0.776
OA2-We can rapidly adapt processes and activities to meet demand fluctuations	0.786
OA3-We can handle issues from suppliers and partners efficiently	0.830
OA4-We respond quickly to market and government changes	0.778
OA5-We seek ways to reinvent our organization continually	0.854
OA6-We see government and market trends that provide for speedy expansion	0.856
Digital transformation (DT) (Cronbach's alpha = 0.865, CR = 0.902, AVE = 0.649)	
DT1-My organization strives to digitalize everything possible	0.810
DT2-My organization collects vast amounts of data from several sources	0.835
DT3-My organization aspires to use digital technologies for additional activities	0.845
DT4-My organization strives to use digital technology to improve service quality	0.759
DT5-My organization strives towards digital information sharing	0.776

Table 2 Discriminant validity-Fornell and Larcker criterion

	DT	DTL	OA
DT	0.806		
DTL	0.521	0.798	
OA	0.488	0.650	0.814
HTMT			
DT			
DTL	0.580		
OA	0.536	0.694	-

ANNEXURE H - ASSESSING THE STRUCTURAL MODEL

Table 3 Hypotheses testing

	Path coefficient	Standard deviation	*t* value	*p* value	Decision
H1: DTL -> DT	0.353	0.083	4.242	0.000	Supported
H2: OA -> DT	0.259	0.058	4.491	0.000	Supported
H3: DTL -> OA	0.650	0.031	21.227	0.000	Supported
	R^2			Q^2	
DT	0.310			0.189	
OA	0.422			0.256	

Table 4 Mediation analysis

	Total effects		Direct effects		Indirect effects			
	β	*t* value	β	*t* value	Hypotheses	Coefficient	*t* value	*p* value
DTL -> DT	0.521	7.892	0.353	4.242	H4:DTL -> OA -> DT	0.168	4.289	0.000

ANNEXURE I - APPROVAL TO USE THE MEASUREMENT INSTRUMENT

Permission to re-use the research instrument in my masters study
5 messages

Dalson Modiba <0010909w@students.wits.ac.za> Mon, 25 Dec 2023 at 15:00
To: bora_003@sjtu.edu.cn

Good day Prof Bora Ly,

I hope this email finds you well.

My name is Dalson Modiba. I am a student at the University of the Witwatersrand in South Africa, studying Master of Management in Digital Business.

I came across your journal (attached here for easy reference), where you studied the Interplay of DTL and OA on DT.

I am a government employee in South Africa and liked your study. I would lime to use your validated research instrument within a South African Public Sector communication service. This would be useful in the context of what you proposed in the journal in terms of future research opportunity, for more research data to be collected to either affirm or dispel the role of DTL and OA in DT.

I would appreciate your feedback in this regard.

Thanking you in advance for your positive feedback in this regard.

Sincerely yours,
Dalson Modiba

Dalson Modiba <0010909w@students.wits.ac.za> Mon, 25 Dec 2023 at 15:17
To: bora_003@sjtu.edu.cn, customercare@copyright.com

Good day,

Hope this email finds you well.

Pls refer to my email below requesting permission to reuse your research instrument for my Master thesis.

Thank you very much.
[Quoted text hidden]

BORA LY <bora_003@sjtu.edu.cn> Wed, 27 Dec 2023 at 09:05
To: Dalson Modiba <0010909w@students.wits.ac.za>

Dear Mr. Modiba,

I hope this message finds you well. Thank you for reaching out and for your interest in my research work. I am pleased to hear that you found the journal on the Interplay of Digital Transformation Leadership (DTL) and Organizational Agility (OA) insightful and relevant to your studies.

I am more than happy to grant you permission to use the research instrument from my study for your Master's thesis at the University of the Witwatersrand. It is indeed encouraging to see the application of academic research in practical scenarios, especially within the South African Public Sector communication service as you mentioned.

Wishing you all the best in your research endeavors and your Master's program. Your initiative to extend the study within the context of public sector communication services in South Africa is commendable and could provide valuable insights into the role of DTL and OA in Digital Transformation.

Best regards,
Bora
[Quoted text hidden]

Dalson Modiba <0010909w@students.wits.ac.za> Wed, 27 Dec 2023 at 12:54
To: BORA LY <bora_003@sjtu.edu.cn>

Good say Prof.

Thank you so much.

Really and truly appreciated

Kind regards,
Mr Modiba
[Quoted text hidden]

BORA LY <bora_003@sjtu.edu.cn> Thu, 28 Dec 2023 at 13:38
To: Dalson Modiba <0010909w@students.wits.ac.za>

You're welcome. Wishing you a very best of luck!
[Quoted text hidden]

ANNEXURE J: LANGUAGE EDITOR CERTIFICATE

DR MICHELLE COETZEE
(D.Phil. Theology – St Augustine's College, 2014)
AUTHORISED LANGUAGE PRACTITIONER
TRADING AS: DR MICKY'S (SA) PROFESSIONAL LANGLITCH FIXING SERVICE
(English)
45A Collins St, Brixton, 2092, RSA • Cell +27 (0)79-516-8067 • coetzee.michelle71@gmail.com

28 March 2024

Dear Dalson Modiba

Language editing

This is to confirm that I edited your master's dissertation, *Digital transformation within the public sector communication service in South Africa*. The editing process included the following:

- Correcting language errors.
- Checking whether the structure of your paper aligned with accepted international standards and a logical flow of information without unnecessary repetition – and suggesting changes, where necessary.
- Checking the clarity of your argument and suggesting necessary changes, such a providing additional details and/or attending to logical inconsistencies.

With respect to language, although I took all reasonable precautions to ensure that all grammatical and stylistic corrections were indicated, you remain responsible for the final product. Some errors might be introduced when you implement the changes or add more copy. Therefore, if possible, perform a spell check after you have implemented the changes or added new material to eliminate typing errors.

Please contact me if there are any queries or if I can be of further assistance.

Yours sincerely



Dr Michelle Coetzee

ANNEXURE K - SUPERVISOR CERTIFICATE