

**A human capital perspective of digital
business and service delivery in
Johannesburg**

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degree of Master of Management in the field of Digital Business**

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Declaration

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

X

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Signature:

Signed at Clayville, Olifantsfontein

On the 28th day of February 2022

Acknowledgements

This is for my sons, Kamohelo Atlegang Tsotetsi and Kananelo Koketso Tsotetsi. Thank you for constantly fuelling me to go on when it seemed impossible. I hope this inspires you to be go getters! Le tswelle pele moo ke felletseng.

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Abstract

The digitalisation of processes and services has grown popular as a result of the fourth industrial revolution. Digital businesses have successfully demonstrated that technology can offer strategic value, inspiring global governments to improve the quality of services offered to the public through digitalisation.

The integration of digital technology into the service delivery strategy of the City of Johannesburg remains a subject with limited understanding. This qualitative study explored the level of integration of digital technologies in the delivery of public services by conducting six semi-structured interviews with the middle managers within the city. The collected data were thematically analysed by applying a dynamic capabilities framework with a focus on human capital.

It was determined that the level of integration is still in its infancy, owing to the decentralised nature of the organisation. It was further determined that the human capital within the city is adequate to improve the level of integration of digital technology with the service delivery strategy from infancy to an advanced state, provided that there is organisational support for the middle managers.

Keywords

City of Johannesburg; digital business; digitalisation; digitisation; human capital; service delivery

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Chapter 1: Introduction

Outstanding performance and productivity are outputs of combined knowledge, skills, and abilities of employees within an organisation (Sweetland, 1996; Wuttaphan, 2017). Becker (1962) defines these combined attributes used by an organisation for improved productivity as human capital. Historically, human capital was considered a cost rather than a source of value creation (McConell et al., 2017). Companies began noting the value of human capital when Theodore Schultz's and Gary Becker's independent studies showed an increase in the national income as a result of investment in education and training in the early 1960s (Sweetland, 1996). To date, business research has shown that digital businesses thrive in the digital environment because of their management's competence (van der Meulen & Rivera, 2014).

Digital businesses compete in an economic landscape that is shaped by the fourth industrial revolution (4IR). They are faced with new technologies which created new opportunities and threats to competitive advantage (Armstrong & Lee, 2021; Morrar et al., 2017). Seizing these opportunities and reducing the impact of the threats requires strategic use of data and technology-based applications, both of which are enabled by human capital (Guo, 2021; Želazny, 2015). While digital businesses are navigating the digital economy almost seamlessly, digital integration in the local government sphere remains a challenge that needs further exploration (Backhouse et al., 2020; Tan & Taeihagh, 2020).

1.1. Purpose of the study

This qualitative study was undertaken to explore the level of integration of digital technologies with service delivery strategy by the middle management of the City of Johannesburg. This was done to understand from a human capital perspective how the digitalisation of the service delivery operations was enabled.

1.2. Background of the study

Industrial revolutions have influenced the process in which organisations create and sustain competitive advantage through automation (Marsal-Llacuna et al., 2015). The 4IR in particular is characterised by an innovative application of information-based technologies such as the internet of things (IoT), information and communication technology (ICT), artificial intelligence (AI), and big data analytics (Morrar et al., 2017). These innovations have changed world economies and given rise to the digital economy (Morrar et al., 2017; Ndaguba & Ijeoma, 2018; Paavola et al., 2017).

Digital businesses are those businesses that are innovatively adopting information-based technologies to find new value streams in terms of business models, customer experience, and internal capabilities to gain a competitive advantage over traditional businesses (Armstrong & Lee, 2021; Liferay, 2022; van der Meulen & Rivera, 2014). For example, Uber has benefitted from the existence of smartphones and the internet to reduce its capital costs, while Netflix enabled convenience and variety for movie and series streaming by gathering data on customer views (Liferay, 2022). It should be noted that interest in digitalisation is not unique to private businesses.

1.2.1. The rationale for digitalising public services

Governments are developing digital and smart cities globally to meet the public service needs and demands as pressure on resources continues to grow due to continuous urbanisation (CoJ, 2020, 2021; UN, 2015). The United Nations (UN) estimated that the global urban population would grow about 1.3 times between 2015 and 2030 (UN, 2014). While South Africa experienced an urban population growth of 5% between 2009 and 2019, the City of Johannesburg (CoJ) alone has seen a 20% increase around the same period (CoJ, 2020b; O'Neill, 2021).

The advancements in technology have helped with alleviating the pressure on resources where new city management and governing models are established to improve the state of their cities and surrounding areas (GFCCU, 2020; Wahab et al., 2020). Below are examples of global initiatives to leverage 4IR technology to provide adequate services with limited resources:

1. Curitiba in Brazil, as well as South Africa, implemented open access networks and broadband strategies to provide free internet in public areas, enabling citizen engagement on online platforms (NPC, 2013; OECD, 2020b).
2. India leveraged the IoT technology to develop smart infrastructure to supply adequate electricity, and e-government systems for customer management (India Smart Grid Forum, 2021).

The City of Johannesburg (CoJ) is constitutionally obligated to improve its safety and security response, reduce poverty and inequality by providing adequate infrastructure for sanitation, roads, water, electricity, and human settlement (CoJ, 2021). It also aims to

meet its service delivery obligations and optimise available resources by digitising its services and operations (CoJ, 2011). Amongst these digital operations, various platforms exist to interact with citizens. These includes website, social media, and online radio platforms:

1. E-services are offered through a municipal website where citizens can manage their municipal accounts online, log queries and complaints, and obtain important information and notifications.
2. A combination of social media capabilities is used to engage and receive service delivery issues observed by citizens. The city is followed by 1 million people on Twitter, 240 000 people on Facebook, and over 500 connections on LinkedIn.
3. The city also has an online radio station that is available on weekdays where notices and important information are exchanged between the city and its citizens.

1.2.2. The value of human capital in digitalisation

While digitalisation includes maximising profits and gaining a competitive advantage for digital businesses (Armstrong & Lee, 2021; van der Meulen & Rivera, 2014), the primary purpose of local government is to serve its citizens. Thus, the City of Johannesburg is tasked with innovatively using technology to provide value (SITA, 2019). The value within local government can be realised in terms of efficiency, productivity, public trust, improved governance (Baud et al., 2014; OECD, 2020a, 2020b). As with digital businesses, citizens are customers who are demanding better service and experience when engaging with local government (OECD, 2020a). According to van der Meulen and Rivera (2014), it is the organisation's competence that will enable the correct use of digital technology to execute strategy.

Many digital businesses have leveraged their human capital in integrating emerging technology with business strategy to maximise value (Becker, 1962; Gray, 2016; Guo, 2021). Human capital refers to the skills, knowledge, and competencies of internal employees from which value can be derived (Meisenberg & Lynn, 2012; Ployhart & Moliterno, 2011). The organisation's competence in terms of human capital includes having leadership that can manage strategy and change (Armstrong & Lee, 2021; van der Meulen & Rivera, 2014). Considering the resource-based view of strategy, human capital is an internal capability that can satisfy the service delivery goals of the City of Johannesburg by leveraging the technology that already exists in the city, as well as emerging digital trends in the environment within which the city operates (Barney, 1991).

1.3. Research problem

The City of Johannesburg is challenged by rapid and continuous urbanisation (CoJ, 2011, 2020a; O'Neill, 2021). Additionally, emerging 4IR trends observed within digital businesses changed the nature of relationships between the government and its citizens (SITA, 2019). The pressure to innovate the processes involved in distributing resources for better service delivery is thus elevated.

The national government directed municipalities to seek new operating models leveraging 4IR technology upon witnessing the rise in the digital economy (PC4IR, 2020). A goal to deliver better and more inclusive services to citizens using digital technology was then set by the management of the City of Johannesburg (CoJ, 2011, 2020a). Although many digitisation initiatives are announced (CoJ, 2019; Makhura, 2021; SITA, 2019), there is a limited understanding of how the current digital strategies are implemented by the City of Johannesburg.

The current strategy implementation status must be well understood to effectively leverage the new digital solutions. Poor understanding of the current state of digitisation may result in inappropriate application of digital solutions for increased digitalisation (Armstrong & Lee, 2021), thereby hindering the progress of improving service delivery. Therefore, it is inherent to conduct a qualitative study to gain an in-depth understanding of the phenomenon. The findings of the study will assist in fashioning out a suitable strategy to effectively take advantage of the benefit of 4IR.

1.4. Research questions

The study seeks to explore the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg. This will be achieved by addressing the overarching question and sub-questions below:

1. What is the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg?
 - 1.1. What is the current state of digitalisation in the management of the City of Johannesburg regarding service delivery?
 - 1.2. What are the objectives for digitising service delivery in the City of Johannesburg?
 - 1.3. How effective are the strategies employed by management regarding the integration of digital technologies in service delivery in the City of Johannesburg?
 - 1.4. What is the level of expertise of management of the City of Johannesburg regarding the integration of digital technologies in service delivery?

1.5. Significance of the study

Academic work on the adoption of digital technology for the improvement of services provided to consumers is done extensively in the context of traditional businesses (Armstrong & Lee, 2021; Saarikko et al., 2020; SITA, 2019; Teichert, 2019). It is for this reason that governments have shown interest in digitising their operations to offer citizens better experience and service (SITA, 2019). This interest has resulted in scholarly works conceptualising possible benefits within the public sector (Janowski, 2015).

Further, there is a consensus in business literature that human capital is a key success factor of digital transformation (Baud et al., 2014; Caffrey & McDonagh, 2017; Paavola et al., 2017; Vial, 2019). It is also noted in public administration literature that municipalities that are unable to understand the needs of their residents obtain negative socio-economic outcomes (Ramoroka, 2020; Wahab et al., 2020; Winkowska et al., 2019). This is because the capability and expertise of municipal managers set the tone for strategy delivery (LGSETA, 2020).

By assessing the state and level of digitalisation in the City of Johannesburg, this study seeks to gain in-depth understanding of the geographical and socio-economic context. In this regard, the in-depth understanding obtained contributes to the existing body of knowledge. The City of Johannesburg is situated in a developing country that has a different socio-economic status compared to the developed countries that are commonly used as case studies in the adoption of digital technologies (Backhouse et al., 2020; GFCCU, 2020; OECD, 2020b). Further, the insights obtained from the city's management might shape the discussions and practical considerations around human capital and

digital strategy for service delivery. This is especially important for the effective adoption of 4IR technology in a South African local government sphere.

1.6. Delimitations of the study

Some authors include natural traits such as personalities in their definition of human capital (Meisenberg & Lynn, 2012). This study only focuses on learned abilities.

The study only assesses human capital on middle management positions in the City of Johannesburg, directly related to public service delivery. Further, human capital in this study only refers to an existing strategic resource, thereby excluding the processes of developing it. The findings are from the City of Johannesburg's perspective. Therefore, the feedback from residents is not in the scope of this study.

1.7. Definition of terms

This study uses concepts that are broadly defined in the literature. This section describes the context with which the terms are used in this study.

1. **Digitisation** refers to the conversion of manual processes taken to service the needs of residents in the City of Johannesburg into digital (Armstrong & Lee, 2021).
2. **Digitalisation** is the process of remodeling the systems of the city, including organisational structures, people, and culture (Armstrong & Lee, 2021).
3. **Human capital** refers to knowledge, skills, and competencies that individual employees have to drive organisational performance (Meisenberg & Lynn, 2012; Ployhart & Moliterno, 2011).

4. **Service delivery** is the fulfillment of the city's residents' needs as defined in the integrated development plan, i.e., infrastructure, sanitation, etc. (CoJ, 2020a).

1.8. Assumptions

The data was collected from participants that are mandated to deliver on service delivery, thus it is assumed that they were honest about their involvement, achievements, and failures in the digitisation of city operations for service delivery.

It is assumed that the human capital was deliberate strategic development for service delivery in line with the resource-based view of strategy. The study, therefore, assesses the impact thereof in the digitalisation of public service delivery operations and outcomes.

1.9. Chapter Outline

This research report consists of six chapters. Chapter 1 provided background and motivation for this study. The research problem and questions were raised and will form a basis for the chapters that follow.

Chapter 2 will provide a literature review discussing the digitalisation of public services and human capital as a driver of digital transformation. Propositions addressing the main research questions will be stated following the literature review. It will also unpack the analytical frameworks underpinning this study.

Chapter 3 will then provide a detailed research methodology followed to collect and analyse data and provide justification for the selected approach. The data collected will be presented in Chapter 4 and then analysed in Chapter 5. Lastly, the report will conclude with Chapter 6 where recommendations will be provided based on the findings.

Chapter 2: Literature review

2.1. Introduction

The rise of 4IR technology inspired innovation through human capital for better performance of businesses (Morrar et al., 2017). Similarly, governments adopt digital technology to improve their operations (OECD, 2020a). The City of Johannesburg is thus challenged with adopting the new digital operation models to improve its service delivery (CoJ, 2011, 2019; PC4IR, 2020).

This chapter reviews existing literature relating to digitalisation and human capital to address the research questions outlined in chapter 1 by developing propositions for the study. It further unpacks the theoretical underpinning which informed the research instrument for data collection and analysis. The chapter then concludes with a conceptual framework outlining the relationships between the constructs identified in the literature review.

2.2. Background discussion

Digital transformation is a phenomenon highly sought after by many organisations seeking to drive sustainable competitive advantage, owing to the emergent 4IR technologies. Digitisation is the first step of digital transformation which relates to the conversion of analogue elements into digital ones (Armstrong & Lee, 2021). While this is important for enabling the digital transformation of an organisation, strategic value is achieved by remodeling systems, processes, and practices through a process known as digitalisation (Armstrong & Lee, 2021). Figure 1 below depicts the relationship between these concepts. Digital businesses thrive because they understand that sustainable

competitive advantage arises from the efforts to remodel and reconfigure processes and practices rather than the technology by itself (Bousdekis & Kardaras, 2020).



Figure 1: The process of digital transformation (author's construction)

The success of digital businesses inspired the governments to improve the quality of services offered to the public through digitalisation (Thakur & Singh, 2012). Service delivery involves the provision of basic services that are aimed at improving the quality of life, i.e., sanitation, maintenance of infrastructure, housing administration (Reddy, 2016). The quality of service delivery in South Africa has been declining over the last decade as indicated by increasing protests from citizens to voice out dissatisfaction (Masiya et al., 2019; Reddy, 2016). The City of Johannesburg is thus undergoing digitalisation in its transition to becoming a smart city.

Digitalisation of public services commenced with e-government, where internal functions and communication were computerised and heavily reliant on ICT (Arafah & Winarso, 2017; Chen, 2010; Thakur & Singh, 2012). The heavy focus on ICT infrastructure is evidence that local governments were initially driven by the internal need for efficiency than the provision of satisfactory service to its citizens (Arafah & Winarso, 2017). However, this can be attributed to the fact that the prevalent form of technology was ICT (Baud et al., 2014).

Developments in digital technologies such as IoT, AI, blockchain, and big data enabled the emergence of digital governments and smart cities from e-government to digital government (Janowski, 2015; Tan & Taeihagh, 2020). Unlike e-government, the digital government borrows principles from digital businesses to drive innovation to better leverage technology (Baud et al., 2014; Janowski, 2015). Further, the digitalisation of processes in digital government is aimed at improving the quality of public services, which is measured through citizen satisfaction (Al-Khouri, 2013; Baud et al., 2014). This indicates that external pressures influence the need for digitalisation in any organisation.

In addition to customer satisfaction and technological developments, there are political and economic pressures that are driving the need for digitalisation (Janowski, 2015; Ndaguba & Ijeoma, 2018; Saarikko et al., 2020). It is therefore inevitable that local government must respond to these pressures by adopting digital technologies (Saarikko et al., 2020). African governments are however struggling to take full advantage of the newer technologies that go beyond ICT (Ndaguba & Ijeoma, 2018).

The difficulty with successfully leveraging digital technologies is not unique to government institutions. For the local government, this means that creative and innovative measures are therefore essential, thereby requiring highly skilled professionals to drive digitisation (Janowski, 2015; Teichert, 2019). This has been observed in digital businesses as they continuously leverage their human capital. It is for this reason that human capital is at the centre of this study.

2.3. What is the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg?

The digitalisation, and by extension, digital transformation inherently changes the nature of an organisation's operation models to deliver on strategic objectives (Bousdekis & Kardaras, 2020). Digital maturity describes the ability of an organisation to respond appropriately to external pressures, enabled by the integration of digital technologies (Thordsen et al., 2020). Organisations that leverage technology better than others are said to have a more digitally matured level (Armstrong & Lee, 2021; Thordsen et al., 2020).

Digital maturity models quantify digital maturity and create a spectrum in which an organisation is placed based on criteria (Armstrong & Lee, 2021). Westerman's model is widely used in business literature to represent an organisation's state in terms of leadership and digital capabilities (Westerman et al., 2014). Though others exist, it is the position of this study that Westerman's model is more appropriate since human capital is at the centre of the discussion. Figure 2 shows the various classifications of Westerman's model as presented by Venier (2017). On one extreme, beginners are characterised by a resistant digital culture with very low technological implementation. The desired state is the digirati, which is characterised by a clear vision and uniform implementation of technological processes and practices.

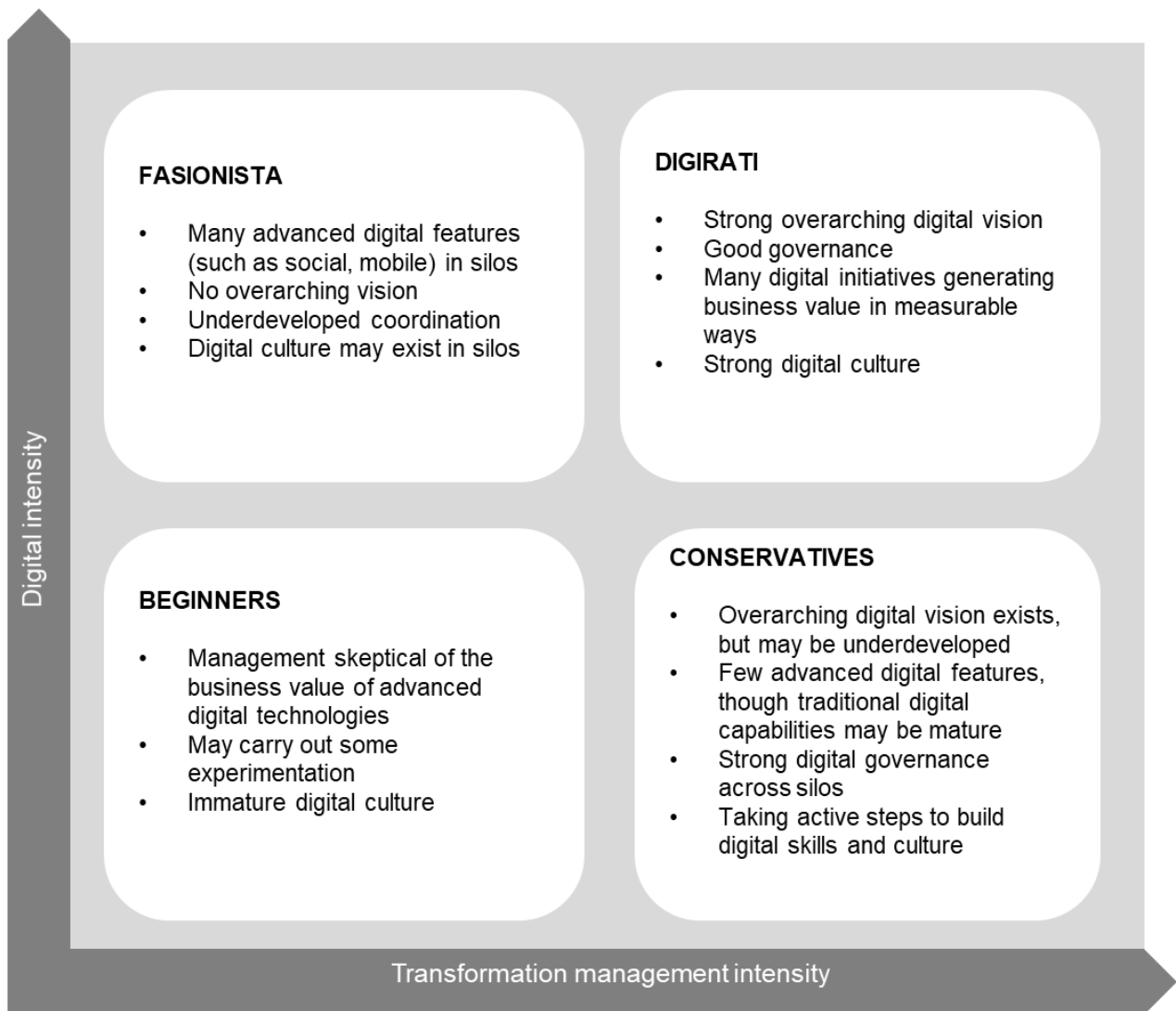


Figure 2: Westeman's digital maturity model as adapted by (Venier, 2017)

Most organisations undergoing digital transformation are faced with aligning strategy with technological developments, especially because they are limited by legacy technology and processes (Bousdekis & Kardaras, 2020; Teichert, 2019). It should be noted that arguments exist in the government sphere on whether digital maturity is attributable to new technology alone or human capital (Arafah & Winarso, 2017; Nam & Pardo, 2011; Tan & Taeihagh, 2020). Nonetheless, many authors on digital transformation

acknowledge that the foundation for implementing technologies correctly lies in skills and knowledge (Holland et al., 2008; Lombardi et al., 2012; Shapiro, 2006).

In agreement with most digital transformation literature, Gulati and Reaiche (2020) have emphasised that human capital is “a key catalyst to implementing change”. They further allude that management effort should be directed to project a change management approaches so that all individuals are aligned to the changing nature of the organisation (Gulati & Reaiche, 2020). This is based on academic work which has shown that soft skills such as creativity are as important as hard technical skills such as data analysis and programming in innovating processes to improve the level of maturity in an organisation (Sousa & Rocha, 2019).

Many models exist to measure maturity, though all of them are different due to context specificity (Armstrong & Lee, 2021; Thordsen et al., 2020). Although these models are typically quantitative, this study seeks to add insights on the human capital components of the models since it remains a consistent input in all of them (Thordsen et al., 2020). This research question is aimed at assessing the level of integration of digital technologies with a specific focus on how human capital affects the integration of technology, thus affecting the digital maturity level. Human capital is limited to the City of Johannesburg’s middle management abilities and practices. The sub-questions that follow seek to assess the level of integration in accordance with the current state of digitalisation, organisational objectives for digitising services, the effectiveness of strategies employed by management, as well as the level of expertise of these managers.

2.3.1. What is the current state of digitalisation in the management of the City of Johannesburg regarding service delivery?

This sub-question seeks to assess the state of digitalisation in the City of Johannesburg. According to digital maturity literature state of digitalisation in the City of Johannesburg is reflected by the level of citizen satisfaction and internal efficiency (Armstrong & Lee, 2021; Teichert, 2019; Thordsen et al., 2020). It has been indicated that South African citizens are generally unhappy with service delivery as indicated by increasing protests (Masiya et al., 2019; Reddy, 2016). Further, there is still a lack of trust in local government due to failure in adapting digital technologies across African countries (Ndaguba & Ijeoma, 2018). These indicators show that it is likely that digitalisation efforts in the City of Johannesburg are inadequate.

Proposition 1.1: The current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives.

2.3.2. What are the objectives for digitising service delivery in the City of Johannesburg?

Literature shows that organisations digitise services in response to external pressures. This is done to leverage opportunities that are presented by digital technologies (Pang et al., 2014). The rise of technology and 4IR developments are constantly changing the operational landscape and the nature of stakeholders (Janowski, 2015). Digitisation can enable the delivery of public services as desired by citizens and other stakeholders, i.e., at their convenience, preferred channel of engagement (Al-Khouri, 2013; Janowski, 2015; Pang et al., 2014). Additionally, local government can also benefit from improved

efficiency and an overview of city needs (Baud et al., 2014). This sub-question is thus aimed at identifying objectives for digitisation in the City of Johannesburg.

Proposition 1.2: The objectives for digitisation in the City of Johannesburg involve improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery.

2.3.3. How effective are the strategies employed by management regarding the integration of digital technologies in service delivery in the City of Johannesburg?

The digital maturity of an organisation can describe the effectiveness of the integration of digital technologies (Thordsen et al., 2020). Vial (2019) stated that human inputs of digital maturity models such as leadership, culture, and structure of the organisation affect the effectiveness of digital integration strategies. If these factors are correctly configured, then the City of Johannesburg will see an improvement in efficiency and citizen satisfaction (Armstrong & Lee, 2021). The increasing protests as indicated by Masiya et al., (2019) and Reddy (2016) indicate the possible ineffectiveness of strategies. This sub-question is aimed at understanding the effectiveness of digitalisation strategies employed for service delivery in the City of Johannesburg as seen by the city's management.

Proposition 1.3: The strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery.

2.3.4. What is the level of expertise of management of the City of Johannesburg regarding the integration of digital technologies in service delivery?

Middle managers are tasked with diverse challenges and responsibilities in digital transformation. According to Caffrey and McDonagh (2017), the responsibilities should be role-based rather than position-based. In a local government context, middle managers are pivotal to aligning the municipal strategic objectives with evolving digital technology (Caffrey & McDonagh, 2017). They are responsible for influencing strategy formulation and execution, managing change, and leading teams (Caffrey & McDonagh, 2017; De Metz et al., 2020; Paavola et al., 2017).

In addition to diverse responsibilities, there are rapid changes in technological environments that require constant reconfiguration of skills and expertise of managers (Caffrey & McDonagh, 2017). The competencies that are necessary to satisfy all requirements are thus functional and behavioural. This sub-question seeks to analyse the level of managerial expertise in integrating digital technology in the City of Johannesburg. This is a component of human capital that is pivotal to digitalisation. The declining quality of service delivery in the City of Johannesburg as declared by Reddy (2016) is an indicator of expertise levels of the city's management.

Proposition 1.4: The level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate.

2.4. Conclusion of Literature Review

This section provided a background and literature review addressing the main concepts that are crucial to the study. It was found that the external pressures trigger the need for digitalisation which can be achieved through human capital. Further review was conducted per the research questions, thus developing propositions as summarised below.

Proposition 1.1: The current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives.

Proposition 1.2: The objectives for digitisation in the City of Johannesburg involve improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery.

Proposition 1.3: The strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery.

Proposition 1.4: The level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate.

2.5. Analytical framework

This section begins by discussing the theoretical framework underpinning this study. It will then provide an overview of the conceptual framework explaining the relationships between constructs, thus informing the research methodology.

2.5.1. Theoretical Framework

It has been established that digitalisation is an internal strategic response influenced by external pressures. Digital innovations occur at a rapid rate and require a rapid response with a reconfiguration of resources and processes (Pulsiri & Vatananan-Thesenvitz, 2018). It is for this reason that the digitalisation of the City of Johannesburg was assessed through a dynamic capabilities lens.

Dynamic capabilities, as coined by Teece and Pisano (1994), describe unique combinations of an organisation's resources to respond to external pressures timeously and rapidly through innovative thinking (Barreto, 2009; Pulsiri & Vatananan-Thesenvitz, 2018; Teece & Pisano, 1994). The theory is founded by the resource-based view of strategy which posits that positive organisational performance stems from resources that have been gathered over time (Barney, 1991). Dynamic capabilities theory builds on this theory, and factors in a changing environment.

Teece (1986) made a clear distinction that while an organisation possesses unique resources, it is capabilities that are essential for the survival of an organisation. Capabilities can be defined as the configuration of available resources to deliver on strategy (Armstrong & Lee, 2021). The focus of this study is to analyse how human capital, as an internal capability, contributes to improved service delivery through

digitalisation. According to Helfat and Martins (2015), managerial competencies are essential resources in integrating change into the strategy and operations of an organisation. The study thus analyses how managers' skills, knowledge, and experience are configured to integrate digital technology with service delivery strategies in changing environments.

Further work into the dynamic capabilities theory showed that surviving in a rapidly changing environment requires appropriate combinations of processes and assets, continuous learning, and taking advantage of opportunities identified in the learning phase (Teece, 2007; Teece et al., 1997). Figure 3 represents the model that will be applied in analysing the data collected for this study. It is believed that managers can leverage their competencies to sense opportunities and threats, seize these opportunities, and transform the organisation's practices to execute on the opportunities identified (Armstrong & Lee, 2021; Helfat & Martin, 2014; Teece, 2007).

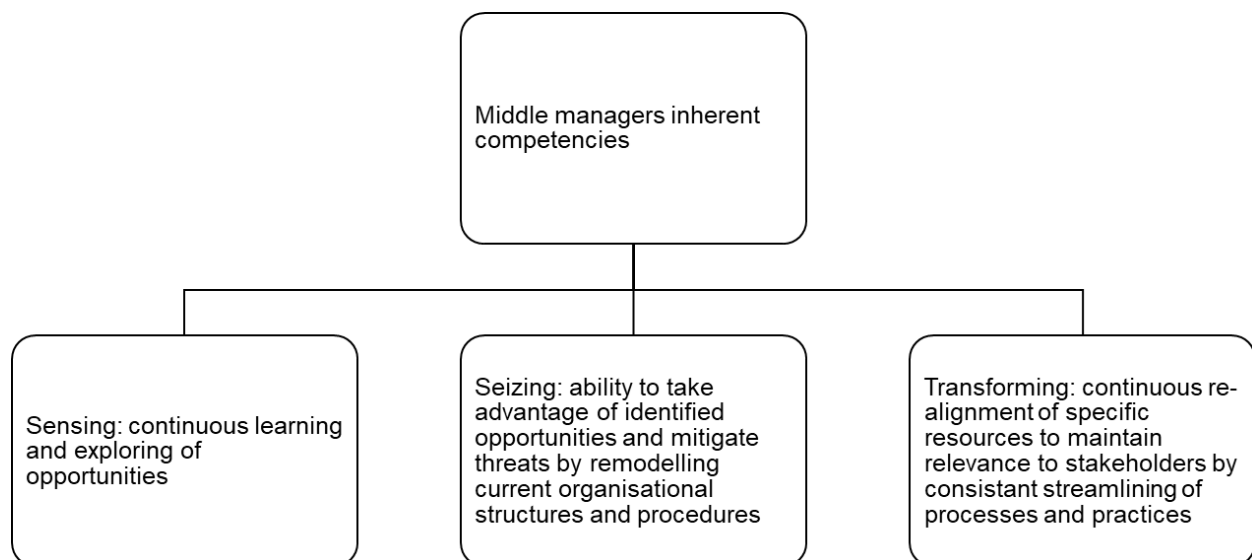


Figure 3: Dynamic capabilities framework adapted and modified from Armstrong and Lee (2020)

It is argued that although it is understood that managers as human capital shape the adaptation of digital technology, it is still difficult to measure impact without factoring in their dominant logic (Kor & Mesko, 2013). Helfat and Martin(2014) refer to this phenomenon as managerial cognition, where the managers' existing knowledge, biases, and beliefs influence how they use their skills, knowledge, competencies, and experience to create and innovate value streams. Managerial cognition affects, amongst other qualities, perceptions of new information, problem-solving, and reasoning techniques (Helfat & Martin, 2014; Kor & Mesko, 2013). The data analysis and interpretation in this study include the relation of mental models and decisions taken by the management of the City of Johannesburg (Helfat & Martin, 2014; Kor & Mesko, 2013; Pulsiri & Vatananan-thesenvitz, 2018).

2.5.2. Conceptual Framework

The City of Johannesburg is faced with rapid urbanisation and digital disruption that are creating pressure to digitise its service delivery offerings and operate efficiently. However, the current level of digitalisation and practices are poorly understood. This study thus explored the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg. This was done by gathering data directly from the city's managers through interviews to assess the state of digitalisation, objectives for digitisation, the effectiveness of digitalisation strategies employed for service delivery, and level of managerial expertise in integrating digital technology in the City of

Johannesburg. A dynamic capabilities lens was then applied in this assessment. Figure 4 depicts the conceptual framework linking the research problem and the constructs that will be studied.

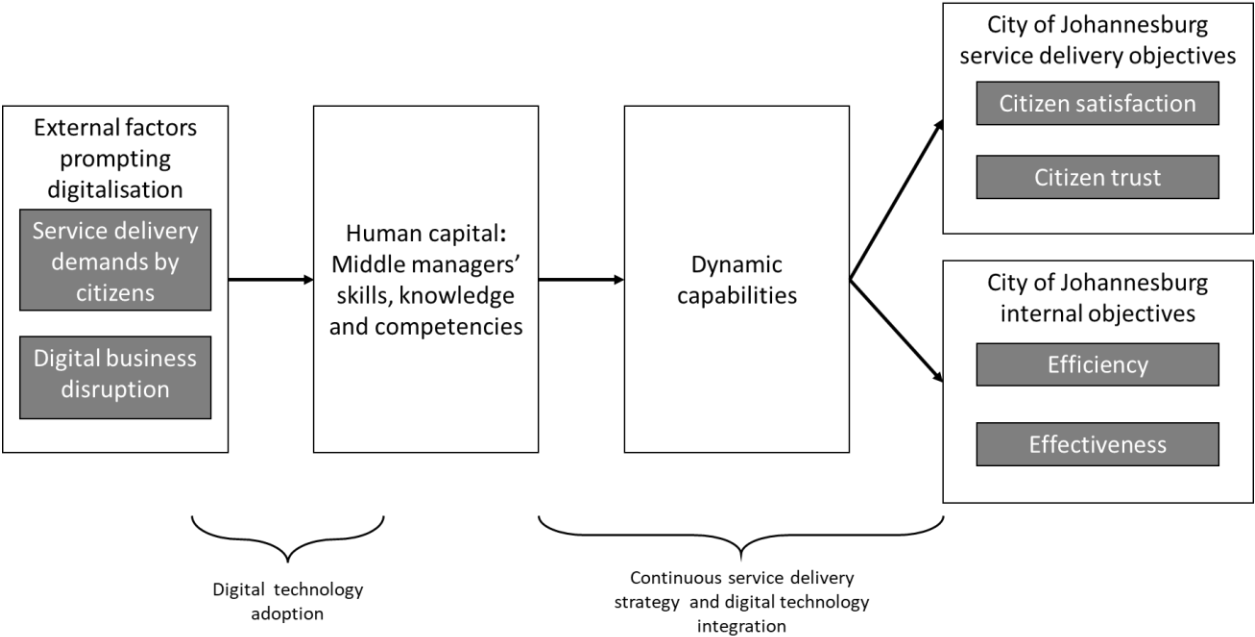


Figure 4: Conceptual framework depicting relationships between constructs (author's construction)

Chapter 3: Research methodology

This section provides an overview of the methodology that was followed throughout the study to address the research question.

3.1. Research approach

The study employed a qualitative approach following an interpretivist paradigm to answer the research questions outlined in chapter 1. Due to limited understanding of the state of digitalisation in the City of Johannesburg, this approach was suitable for gaining insights into the phenomenon. Specifically, the chosen methodology will elucidate the experiences of the City of Johannesburg's middle management regarding digitalisation. Further, the approach was useful in developing an in-depth understanding of human capital as a contributor to integrating digital technology and service delivery (Chilisa, 2012; Vaismoradi & Snelgrove, 2019).

The qualitative approach is widely criticised for its subjectivity (Harrison et al., 2017). However, it was appropriate for this study as it is exploratory. It was for this reason that contextual considerations were made during data collection. The assumption was that the realities and truths of each individual who participated in the study emanated from their perception and experience of digitalisation (Bashir et al., 2008; Chilisa, 2012). This will be expanded upon in the research design as it affects the results and interpretation presented in the next two chapters.

3.2. Research design

The qualitative research was a case study of the City of Johannesburg focusing on middle managers. A case study considers real-world issues based on existing scenarios and allows the gathering of data from different sources (Creswell & Creswell, 2018; Harrison et al., 2017). This was especially important for assessing the objectives and service delivery outcomes based on how managers integrate digital technology.

The data collection process was lengthy due to the nature of a case study design, thereby limiting the number of participants. The data were gathered through one-on-one interviews. However, the nature of a case study and interpretivist approach required the validation of primary data (Bashir et al., 2008). It was therefore imperative that an analysis of the publicly available data was done to validate the feedback from the participants, hence the IDP was the source of such data. Purposive sampling was used as a sampling method for this study. Detailed steps are provided in the sections that follow.

3.3. Data collection methods

Primary data was collected through one-on-one semi-structured interviews conducted on Microsoft Teams with middle managers in various departments within the City of Johannesburg. The choice of data collection method was based on the desired outcomes of the interviews, as well as the practical considerations.

Semi-structured interview questions are advantageous in that they align the data to the constructs that have been identified in the literature review (King, 2004). The flexibility to adjust the questions as desired was applied as the different departments had different

experiences. However, the questions were confined to the literature to ensure that rigour was maintained.

One-on-one interviews provided the participants with a comfortable space, allowing them to be more honest (Creswell & Creswell, 2018). Additionally, the participants needed to be booked well in advance due to the nature of their work and the fact that the interviews were conducted during their year-end reporting period, making it more convenient that the interviews were kept separate.

One-on-one interviews are suitable when direct observation is not practical (Creswell & Creswell, 2018). Neither focus groups nor face-to-face interviews could be done due to regulatory and health considerations during the COVID-19 pandemic. There was an ethical need to ensure that the participants are socially distanced, and the coronavirus is not transmitted during the sessions.

3.4. Population and sample

3.4.1. Population

The population identified for this study included middle managers in the City of Johannesburg directly responsible for integrating digital technology in various service delivery departments. No other criteria were applied for participation. However, demographic data were collected for the descriptive purposes of participants.

3.4.2. Sample and sampling method

A purposive non-probability sampling method was used as a sampling method for this study. This method is advantageous in that the choice of participants was based on their

knowledge and expertise regarding the phenomenon being investigated (Creswell & Plano Clark, 2011; Etikan, 2016). Additionally, it depended on the availability and willingness of the participants (Etikan, 2016). This provided the participants with a platform to reflect on their experiences and express their opinions adequately (Bernard, 2017; Spradley, 1979).

It should be noted that the method assumes that there would be no difference whether the sampling is probabilistic (Etikan, 2016). However, the selected method was appropriate because the data required to answer the research questions could only be obtained from the City of Johannesburg’s management due to their experience and involvement in digital technology integration. There were 13 participants identified across the City of Johannesburg to participate in the study as shown in Table 1 below. However, the response rate was low, resulting in six participants.

Table 1: Desired sample size by department

Department	Number of participants
Municipal manager	1
Environment and infrastructure	4
Water and sanitation	4
Customer relations and urban management	4
Total	13

3.5. The research instrument

The data were collected through a series of semi-structured questions as per the interview guide attached in Appendix A of this report. The relationship between the interview questions and research questions is shown in Table 5 of Appendix B at the end of this report.

The questions asked in the interview guide were informed by the preliminary literature review at the proposal stage, as well as the constructs that are shown in Figure 4 of the conceptual framework. The choice of semi-structured questions was informed by the need for participants to give detailed responses based on their experience well within the theoretical framework (Creswell & Creswell, 2018).

3.6. Procedure for data collection

The City of Johannesburg was the site for the study, thus permission to conduct the research was requested and obtained from the city manager's office. Each participant was sent an email requesting them to participate once permission had been granted. One-on-one interviews as described by Creswell and Creswell (2018) were scheduled and conducted on Microsoft Teams.

The interview questions and consent forms were sent directly to participants well in advance before the scheduled interviews to allow enough time for participants to prepare. The consent letters included a request to record the sessions, and verbal consent requested during the interview sessions. Recordings were necessary for transcription and will be used as proof of data collection if required.

3.7. Data analysis and interpretation

The responses from participants were analysed using deductive thematic analysis. A theme organises repeating ideas about the same concept to derive meaning (Vaismoradi & Snelgrove, 2019). This analytical method is known to produce trustworthy findings that are rooted in tested theory (Braun & Clarke, 2006; Nowell et al., 2017). Further, it is known for its flexibility in finding patterns (Braun & Clarke, 2006). However, there is a risk of inconsistently deriving themes due to the flexibility of thematic analysis (Nowell et al., 2017). The themes were therefore identified deductively using the constructs identified in the literature review chapter. The analysis was conducted following guidelines by (Braun & Clarke, 2006; Creswell & Creswell, 2018):

1. The recorded interview sessions were transcribed into text.
2. Initial codes were generated using keywords relating to constructs identified in the literature section. Additional codes were created upon iteration while others were merged to remove redundancy.
3. The codes were organised according to themes which were then mapped out to show relationships. Although the study initially took a deductive approach, an inductive emergence of themes was allowed where there was a clear link to the constructs identified in the analytical framework. This was necessary to allow an organic development of themes and counter the risk of biased interpretation of the responses.
4. Patterns within themes were identified to conclude. These will be presented and discussed in detail in the next three chapters.

3.8. Limitations of the study

Below are the limitations were identified during the data collection stage. These have a direct impact on the outcome of the research:

1. The data collection was done by electronic means, which limited the interviewer's ability to interpret the non-verbal cues.
2. Data collection is dependent on the willingness of participants (Etikan, 2016). The initial sample had 13 participants, but only six were able to participate and provide insights based on their knowledge, which was at times limited.
3. Bias and subjectivity existed at the beginning and during the study due to the interpretivist approach chosen (Chilisa, 2012).

3.9. Transferability and dependability

The trustworthiness and quality of a study are required for the insights to be meaningful and have a practical impact as intended (Tracy, 2010). The trustworthiness of this study was ensured based on the transferability, credibility, and dependability as outlined in this section.

3.9.1. Transferability

Transferability refers to the ability of the research to equally apply to a different situation or context (Tracy, 2010). The context and assumptions of the research are therefore explicitly declared in this research report.

The interviews were conducted in English as far as possible so that no participant's experience is lost in translation. In addition, the data analysis and interpretation will refer to direct quotes so that the context is well understood by the reader.

3.9.2. Credibility

Credibility as described by Tracy (2010) relates to the level at which readers can trust and act upon the recommendations made in a report. This study depends on views from different individuals, which can result in a lot of bias. As outlined in the theoretical framework, the mental models of the participants were considered and presented with findings, thus improving the credibility. Although the data analysis started with a deductive approach, themes were allowed to emerge organically within the broad framework so that bias does not supersede the participants' views. Further, the data collection and interpretation were rooted in the literature review, theoretical and conceptual frameworks detailed in chapter 2.

The research design and instruments will also be made available so that any reader who intends to replicate the study was able to do so. Furthermore, transcripts of the interview will be made available to the university and Wits Business School.

3.9.3. Dependability

Dependability is concerned with consistency regarding the collection and analysis of data (Bashir et al., 2008). To ensure that the research is dependable, the steps taken to collect and analyse the data are outlined both in the research proposal and the research report. Semi-structured interviews were conducted, and the interview guide is attached at the

end of the proposal. Further, the settings of the interview for all participants were kept consistent.

3.10. Demographic profile of the participants

Six participants agreed to be interviewed regarding their respective roles in the City of Johannesburg. These individuals are responsible for implementing the digital strategy of the city to improve service delivery. It can be deduced from Table 2 that the City of Johannesburg's service delivery strategy is led by a young management team with a rich formal learning culture. Except for participants 1 and 5, all participants have only been in the City of Johannesburg in terms of obtaining public sector experience. The service record in Table 2 also shows that there has been successful retention of the management staff, with the experience term reaching at least five years for most of the participants. It was also observed during the interviews that there is a balanced combination of Non-IT and IT-related qualifications amongst the participants.

Table 2: Participants profiles

Gender	Age group	Years in City of Johannesburg	Years in current role	Years in Private sector	Education	Years since latest qualification obtained	Designation
Male	40-49	15+	10-15	0-5	Postgraduate: Non-IT filed	0-5	Manager
Male	30-39	6-10	6-10	0-5	Bachelor's degree and professional certifications ²	10-15	Deputy director
Female	30-39	0-5	0-5	0-5	Postgraduate: Non-IT filed	0-5	Senior technical specialist
Male	30-39	6-10	6-10	6-10	Postgraduate	6-10	Specialist system analyst
Female	49+	10-15	0-5	10-15	Postgraduate: Non-IT filed	10-15	Deputy director and Program manager
Male	30-39	6-10	6-10	None	Postgraduate: Non-IT filed	6-10 and currently pursuing another	Senior specialist & Acting director

The responsibilities of the participants' departments are described in Table 3 below. It can be seen from Table 3 that many different departments are mandated with different responsibilities within the value chain of service delivery in the City of Johannesburg.

Table 3: Participants' daily responsibilities in the City of Johannesburg

Participant	Description of responsibilities
P1	Manages emergency contact centre where emergency services need to be dispatched within a short period.
P2	Implementation of digital transformation strategies, including social media and web strategy of online channels.
P3	Manages the legal administration of city development and land use at the post-approval stage to determine the impact of changes in land use.
P4	Manages, maintains, and enhances the overall life cycle of digital systems within the city.
P5	Responsible for strategy and strategic frameworks and the innovation thereof to deliver the Smart City goals in the City of Johannesburg.
P6	Responsible for developing spatial plans which guide land-use decisions and infrastructure spending in the city.

3.11. Ethical considerations

There was a direct interaction with the participants as prescribed by the research approach. Below ethical considerations were made in line with the University of the Witwatersrand's ethical guidelines:

1. Written and verbal consent for participation and recording of the session was obtained from participants.
2. Participants were informed that they were allowed to withdraw from the study at any point without incurring any penalties.
3. Participants were also informed that the recorded interviews are solely for academic purposes and will remain the property of the University.
4. Personal data were not collected in the study to keep the identities confidential per the ethical clearance certificate.
5. The purpose of the study was reiterated to participants before the interviews took place.
6. Data were not collected before the ethics clearance is received and signed.

Chapter 4: Presentation of findings

4.1. Introduction

Six participants holding middle management roles within the City of Johannesburg were interviewed individually on Microsoft Teams regarding their experience with integrating digital technologies in their operations for service delivery. This chapter consists of the findings from these interviews, which will be presented in a form of tables and direct quotations from the various participants in a narrative manner. The verbatim of these participants will highlight how the integration of digital technology with service delivery occurs in the respective areas of the city.

The findings will then be presented according to the four research propositions developed in chapter 2, to ultimately address the main research question. A summary of the findings will then be tabulated at the end of the chapter.

4.2. Findings from the interviews

This section aims to provide an overview of findings from the interview sessions regarding the integration of digital technology with service delivery. The responses are grouped according to the specific propositions developed in chapter 2 of this paper. The specific interview questions are provided in Appendix A and matched with propositions in Appendix B.

4.2.1. Proposition 1.1: The current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives.

When asked about the current state of digitalisation within the city, three common themes emerged across all participants, i.e., the pace of digitisation, the evolution of technology, and the level of digitalisation.

The pace of digitisation

This theme describes how fast the process of digitising service delivery operations is taking place. Verbatim from a few participants shows that the digitising process has been gradual over the years.

“So the past two years we've been developing the contributions calculator... I mean for three years I've seen the improvements, so I'm thinking we're going to get there.” P3

“I think we are moving to a point where we're accelerating it principally due to COVID. I mean, we had been lobbying for the transition into a smarter city at economic development. I was the director who spearheaded the Broadband initiative that we had as a city. And one of the things that we were pushing for is the evolution of the smart city... of the ICT strategy into more of a smart city strategy. So we've been pushing that since about 2010 and it eventually got approved and accepted in 2013. And then you know the city has been moving very slowly towards transitioning...” P5

“So you know the digitalization that's happened over the last sort of 20 years in Joburg and in planning in general, I think, has been quite positive in that it allows us to get deeper insights from the information available” P6

The evolution of technology

This phenomenon refers to the changing nature of technologies and processes that have been implemented as part of the digital transformation of the City of Johannesburg. It can be noted from the verbatim statements below that there have been incremental changes to the technological implementations and roles within departments.

“So not major digitization has taken place except for the telephony aspect, and then obviously we've moved from the server setup to a voice over IP.” P1

“The strategies are no longer an IT project. Teams is not an IT project.” P2

The degree of digitalisation

The degree of digitalisation explains how well the various digital technologies and systems are integrated into the service delivery operations. According to the middle managers of the City of Johannesburg that were interviewed, the departments are decentralised such that there are varying degrees of integration within departments of the city. It was also found that some of the departments are using a hybrid working model made up of digitised and manual processes. Further, processes are not streamlined as seen with the below quotes.

“Oh look, it's quite high. It is quite high. As I said to you, there's nothing. No paper is required in my environment. Everything is done digitally.” P1

“So sometimes the processes are not so streamlined, you know, and they're not so digitized. If I may say, you know so there's a lot of manual work that you still work.” P3

“When you speak of the City of Joburg, it's quite vast. It's a decentralized municipality, so there are different departments. Because of that decentralization, how we function is, it differs, meaning they'll each have their own IT even though there's still a global IT if you want to call it that... But for instance, our department, which is the department of town planning, our systems are very integrated as I mentioned. So we have our town planning systems or enforcement systems, and SAP systems. These are all integrated within our system called Land Information System.” P4

“I think we are moving to a point where we're accelerating it principally due to COVID. I mean, we had been lobbying for the transition into a smarter city at economic development.” P5

“I think you know we are still in early stages and we can improve but you know, there's still is very much a dual system in place where we've got, for example, with land use applications, those are mainly paper-based applications.” P6

4.2.2. Proposition 1.2: The objectives for digitisation in the City of Johannesburg involve improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery.

The participants were asked about service delivery priorities so that the precursors for digitalisation can be understood within the context of their respective departments. It was discovered that in addition to service delivery objectives, the middle managers were also faced with the changing environment due to COVID-19.

Service delivery objectives

Service delivery objectives are those that are associated with providing adequate public services for the benefit of the city's citizens. The responses from the interviews showed that service delivery objectives revolve around providing services that address the needs of the city's residents and stakeholders efficiently, within a short space of time.

Different departments within the city have the desire to reduce turnaround times for service queries and developmental needs of the city.

"It's a call centre. You've got to answer the phone within - 80% of your calls within 60 seconds." P1

"...to fast track development and obviously efficient development." P3

"...meeting our turnaround times so we are measured on time and how long we process an application and respond to clients" P4

There was also a strong desire to create efficient processes. This refers to better servicing of stakeholders at their convenience.

“Instead of somebody calling in the call centre and impacting on our ability to achieve their strategic objectives that is a portal that allows them to help themselves so it reduces traffic into the call centre.” P1

Citizen engagement and satisfaction are measures that the city uses to improve both service delivery and understanding the needs of its residents. The city seeks to drive citizen engagement to retrieve enough data on service delivery needs,

“So our priorities is to create online platforms, communication platforms, and engagement platforms. To enable engagement and communication much easier than before. For instance, during COVID you couldn't really have mass events.” P2

“... also to ensure an integrated development, you know when I say integrated, it means a lot of things, but I could just say that we get everybody, the community involved, stakeholders involved and you know MOEs involved.” P4

“To enhance the liveability and the economic growth of the city of Joburg.” P5

Covid-19 pandemic

Additional insights from the interviews showed that besides improving service delivery, the city needed to digitise its operations due to the COVID-19 pandemic delaying the delivery of services further. The city realised the need to reduce the disruption time of

operations. The smart city agenda arises from the latest digital disruptions observed from non-government entities.

“It was a national state of disaster. You know all the things we did, were it not for the disaster, we were never going to be able to pull it off the ground.” P1

“COVID-19 helped us a lot. Because most departments were becoming desperate to automate their processes because they couldn’t have queues and staff were working from home. There was a much more need for systems to work and for people to process wherever and to be able to work wherever they are.” P2

“We’re still doing a lot of things on manual and like as I told you I’m doing post-approval. So because of the pre-approval, those are the people that accept the applications from town planners or registration, and now because of COVID, they’ve had to, are being forced to get applicants to submit their applications online.” P3

“I think we are moving to a point where we’re accelerating it principally due to COVID. I mean, we had been lobbying for the transition into a smarter city at economic development.” P5

4.2.3. Proposition 1.3: The strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery.

To assess the effectiveness of the strategies undertaken by the city’s management in the integration of technologies, the participants were asked about the challenges, initiatives in response to these challenges, and the outcomes of the initiatives.

Challenges facing management

The challenges that are inhibiting the progress of digitising operations as the City undergoes digital transformation include technology and processes, people, as well as resources

Technology and processes: It was found that the processes relating to service delivery and internal operations within the city are currently inefficient and based on old policies that do not align with the digital strategy. Furthermore, the existing technology is inadequate and unsuitable to accelerate the digital transformation. The below responses explain this observation.

“At the moment, if you come into the city of Joburg and say, give me. All engagements that you've had with your communities in 2000. They don't have it.”

P2

“Policy environment. IT policies that are archaic. So for instance, in the city that there are people who still don't have access to YouTube. I don't have access to Chrome... I use Internet Explorer. Some things are blocked. And lots of people don't have access, in the city, don't have access to YouTube and social media although we have the largest social media footprint in local government in Africa. But our employees cannot see our tweets and now Facebook and Instagram posts.” P2

“The challenge is that you know we're coming from a position where there are different departments and different MOEs. No one was there to align the different departments previously... OK, how do you standardize your data? How do you

make sure it's reliable? How do you make sure it is the integrity of it etc.? And then also how do you use software that interface with each other.” P5

People: It was also found that the people within the organisation are either resistant to change, or are not equipped to adopt the new technological advances:

“Because of platforms, the no-code revolution is here. The platforms are robust. They give the templates to tweak and work on. But you still find some of their colleagues in IT who want to code the thing from scratch and they do that at a cost to you as a client. And obviously, it takes them years to put together that app that could have taken 5 minutes.” P2

“So some of the challenges were those of adoption, change, difficulty in change, changing of business processes, and eventually just wanting the system basically to do everything.” P2

“I think, also digitization is also a paradigm shift you know. Some other people are just like, "oh, I don't know how to do this" because there are still people, believe it or not, who cannot type a simple email, you know? Or who find it difficult to even type a letter you know. So how do you then expect them to be able to work on open servers?” P3

“The challenge is some people may lose their jobs or their positions. And some are not tech-savvy, so they take longer to accept, some don't accept totally.” P4

Additionally, an issue of the discriminatory potential of digitalisation was raised by some participants:

“So the trade union came in and they had several issues. The first was that the city must first give them data. Give them some indication of how they're going to compensate them for utilities, electricity, water that they're using. That was one, the second one was that we're discriminating. Not everybody can work from home. What about the guy who lives in a Mkhukhu [shack]? What about the guy who lives in a backroom?” P1

“One common one that comes up is digital literacy. So if for example, the first link I sent you is an online map, people firstly need access to a computer or a cell phone that has data. And secondly, you have to be confident enough to be able to use it. You know someone like yourself, who's well educated will find it very easy to go through that map and understand how it works, and you know you're familiar with Google Maps and that sort of thing. But a granny from Soweto might not be as familiar and as able to do it, so that's a big thing.” P6

Political influence was identified as a major factor contributing to the implementation of new technology to address service delivery needs. Three of six participants provides scenarios where political influence was an inhibitor to digitalisation projects:

“It's also very political with us. You see because those shop stewards are very high up with the governing party and up there the instruction can come from the top to stop something with immediate effect and we would have to comply.” P1

“Because if the mayor, the members of the mayoral committee, feel like the way things are done is the right way, they are. So they can pose a drawback. I guess because most of those people that are there are political appointments and it's not everybody that's going to understand the importance of digitalization or even understand how the systems work or how they are meant to work.” P3

“All of the working good ideas can be as good as you like it to be, or can be as good as you can hope for, but in the end, you still do need political buy-in for these projects. Sometimes the projects can be done, they can be technically sound and not get political buy-in because they're not in line with the various political mandates of whoever the political leadership was at the time.” P6

Resources: The feedback from the participants also shows that the City of Johannesburg has limited resources, which hinders the digitalisation process:

“VPN was something that was normally given to managers, senior managers after serious motivations, right? That's so the first barrier, it was the hardware. The second one is the VPN licensing and then the third barrier was the data packages.”

P1

“The city doesn't have a lot of money. You know, because you have to fight for things to do your job. You know, basically to get even laptops, to even have the printer running and in a proper state, you have to fight even to get a pen.” P3

“You must justify them. some there is a financial factor, some it is capacity. Will we have enough technical skills internally to manage or to develop the documents or whatever the case may be? And also obviously the business itself. Do you have people who understand the business?” P4

“We do have a limited budget to do these sort of things you know, basically limited resources. So it was all done internally. And we could have done with some more support, possibly from a service provider in terms of you know more access to various resources, software skills, and data.” P6

Furthermore, there is competition for the budget in terms of immediate service delivery objectives and modernisation:

“So while we know in the future it will help, the problem becomes the pushback right now when they have an immediate demand, an immediate scorecard challenge and the city comes in cuts their budget. The city has cut their budget, but they still need to fulfill what they need to do within that cut budget as well as try to now find portions to invest in a technological solution.” P5

Management initiatives in response to challenges and digital transformation

The strategies employed by the middle management in the City of Johannesburg to mitigate concerns around digitalisation are targeted at challenging stakeholder mindsets by various means of training, demonstrations, and piloting of transformation projects. The following quotations emphasise this idea:

“I sort of took the ones who were open-minded and I ran with them. I did the pilot with them quickly and once the pilot was successful, you know just to check if the connection was okay and that sort of thing. Once that was successful, we rolled out the rest of the guys. And as those benefits started accruing they, the ones who were reluctant, started realizing that the city is never going to have money or if they do, it's not going to be in the next month or two or three, or four or five.” P1

“We've had to train and take through our stakeholders on how the system works. Some had such difficulties with change, they just wanted the old way... But as they started adopting, they started to realize it was a good platform and then some were enjoying it, some of the challenges were obviously that why can't the system do this and that and that and that to become better and optimize the process.” P2

“So it's just that patience and training, reiterating and simplifying. And like now we developed tutorials not only documents but also created videos as well, interactive videos, so it's just implementing such interventions to simplify the process and make it less intimidating for users.” P4

It was emphasised that another useful strategy in changing mindsets is involving stakeholders and being cognisant of their norms in the initial stages of developing a new digital project can reduce resistance:

“They just want to make sure that they are engaged in the process of selecting technology. Because the user is kind of the end product, right? So if you create something that the user finds too cumbersome, they're not going to use it, so it ends up being a waste of money. If you develop something that the user thinks is too convoluted and doesn't respond to them generating more efficiencies, they're not going to use it” P5

“So like if a new online application system happens, we should be able to have someone at the front desk was able to receive a paper application and assist that person to make the application digitally.” P6

“So if you go online and your form doesn't start with your name? It doesn't give you an option to tick a box here. If it starts asking you for a whole bunch of sentences or just lines and says fill in this form, you are going to have a conniption, so it needs to look like what I've already seen. You don't go into a tax app without it looking exactly as the tax form looked like before. Or onto Home Affairs or until licensing without the application looking exactly like it looked before” P5

Another strategy was to manage stakeholder concerns through negotiation and continuous communication by showing benefits on an ad hoc basis:

“I would communicate that we've now closed the building due to a positive case of COVID. We've indicated on the IVRs how the city residents can access different services of the city like prepaid or whatever and then I would tell them that emergency call-taking is not impacted. They are continuing operations as normal because they work from home. I think that is what eventually swayed senior management fully, because they were able to say to the politicians, hey we've shut down.” P1

Some of the resource challenges were mitigated by directly getting involved in finding alternative sources of funds and resources, and also deploying non-invasive technology, as seen on the below insight:

“So what we're trying to do is we were trying to work with like your DBSAs, your world banks your other organizations that one will help us to, so we then are shaping ourselves into being kind of the ones who helped to transition, so they would be the ones that acknowledge and identify what it is they want to transition to. But we are the ones who then need to try to find the source of additional funding, the source of additional support now with national, with the 4IR Commission. And some of the support that's coming through from national, we're hoping that will be better able to achieve those things.” P5

“So cloud-based CRM's and systems are helping us with the automation, data storage, data analysis, data processing, and permanent storage, accessibility. Anybody through login in the institution can log in. Institutional memory as well. So those are some of the benefits.” P2

Outcomes of deployed strategies

Upon successful digitalisation projects, the City of Johannesburg has realised significant benefits from the strategies employed, which have accelerated digitalisation. Benefits are realised both within internal processes and for the recipients of city services.

Internal benefits of successful digitalisation: The city is benefitting from more efficient processes, efficient use of resources, and reduced interruption of operations.

“Attendance improved. Over-time spending has been reduced. Right, so we don't have to spend as much money on overtime because everybody is at work.” P1

“The data is stored on the website or the cloud-based CRM and it's analysed by the CRM. And every year we can go back there and study that data again” P2

“We are saving on printing. Also, a document that typically needs to be signed by five or six people in different floors can now be signed using digital signatures. It streamlines the process.” P4

Additional benefits include the acquisition of reliable data whose integrity can be maintained for even better services:

“Like with our online surveys, we can produce reliable reports, and data that we have is also more trustworthy. And more secure and you maintain data integrity. Whereas in some instances in the past where we relied more on you know, capturing something on the physical notebook or book that took... Yeah, the reliability is minimized.” P4

“The benefits are creating a way for us to channel more information and more reliable information into the city. And integrating that data and then analysing that data so that will help us to make better decisions.” P5

The digitisation of some services has enabled better analysis, thereby allowing the city is to provide more relevant services to its residents from the social media strategies:

“These platforms and social media we've been able to get far more information about the citizens and their demands where they record problems.” P5

“It's sort of often easier to communicate ideas through digital maps and online platforms. But more than that, if you got sort of paper-based maps and paper-based data, it's not very easy to perform analysis on it and get insights from that data.” P6

Citizen benefits from successful digitalisation: The residents within the city are benefitting from more availability of systems needed to interact with the city. There is also improved turnaround times for stakeholders to receive feedback.

“When systems go down we can use the interactive voice response. And on there we will say we are down at the moment, but if you go to citypower.mobi or Joburg water or on Twitter you can log a call there. So when we're down systems-wise, we can use the interactive voice response so the caller will call if you get a message.” P1

“So you no longer need to wait for the office hours for you to submit an application for a meter or an application for electricity and water connection, or to talk to someone in government. You're no longer limited by the hours.” P2

“We are now doing away with long turnaround times. So basically everything is going to be in one sheet, assessed by one person and for me, the pipe is going to be built quicker. You know, the pothole is going to be fixed faster. Or the road is going to be built faster, the park, the school. If you look from a social perspective, there is a lot of social services like hospitals and police stations and schools that most communities are lacking, even community facilities. So the faster that we can do our job, the faster we can deliver those services.” P3

An added benefit for city residents is the ability to collaborate with the city to solve their problems and possibly earn a living:

“With these platforms and social media, we've been able to get far more information about the citizens and their demands where they record problems, the type of solutions that they were recommending, and then we're moving even further along to say how do we support young innovators to find solutions to the problems that they have experienced in their own communities? Most of them who are presenting to us or who respond to our innovation calls are people who have experienced something and decided, how do I make this into a business? How do I solve this and create something that everyone who has this problem can use to solve their issue.”

4.2.4. Proposition 1.4: The level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate.

The competency levels of the middle managers of the City of Johannesburg in integrating digital technology into service delivery operations were assessed through a series of questions about their responses to challenges, as well as their understanding of digitalisation. Their mental models were also assessed by asking questions about their opinions on change and technology, as well as their lived personal experiences outside of the public administration duties.

Managerial competency

Managerial competency describes the combined skills, knowledge, experience, and understanding of digitalisation.

Understanding of digitalisation: When asked about their understanding of digitalisation, the participants associated the phenomenon with automation of processes for better performance and reduced processing time. Verbatim from the participants is as shown:

“OK digitalization, I see as the movement of activities and functions from a manual way to an automated way that is enabled by technology hardware and software. With the aim of speeding up and improving how things get done.” P1

“It's basically automating the traditional business processes by making the processes digital. So it's the automation of business processes. Digitalisation is the automation of business processes using web-based technologies or any other technologies.” P2

“Things that were being done manually and now you can do them like on an online system or you know, or something. I think that's what I understand. So basically something that was done manually before and then now you are able to import get outputs from, you know, putting it in an online system or a specific device.” P3

“I guess it's in moving within technology space. That's how I would define it. Moving into technology using technology. And perhaps there was no technology. Then you move into technology or there is some better technology and then you improve it like going with analogue to digital.” P4

“Digitalisation is really how do you bring more efficiencies into someone's hands and to minimize the amount of time that has to be wasted going to a physical location or engaging with something physically.” P5

Collective skills: The participants demonstrated that their dominant accumulated skills for successful integration of digital technology and service delivery strategy were mostly interpersonal skills such as negotiation, communication, stakeholder management:

“I had to get their buy-in and I had to let them a fight with IT for me to get those licenses I had to get them to get group risk to insure the machines.” P1

“It's quite a complex environment man like. I mean, just now this meeting. It's just back and forth, shouting back and forth, you know.” P4

“As I explained earlier, the people who are sitting at the mayoral committee don't necessarily understand all of these things. We need to break down the different changes to them until they understand properly.” P3

“The lesson is just managing expectations because we're dealing with quite a bit. There are many actors involved as stakeholders.” P4

The technical skills that emerged from the interviews include analytical ability, requirement analysis, and project management:

“Mine is gathering requirements and developing the business requirements documents. So the scoping is important, meaning the requirements gathering is important. You have to be as precise as possible because whatever is captured in the requirements will be what should be in the system.” P4

“Looking at some of our catalytic programs in our key interventions and managing the projects, even if that is, you know, developing a project management office or interfacing with lead departments just to ensure that the initiatives are moving forward and getting whatever additional support is required.” P5

“So what we would do is say in a department that is leading a particular program meets GIC T to sit down with it to identify what software or what technology is required in order for them to transition into a particular type of platform or application.” P5

Collective knowledge: Besides their formal education and training described in Table 2 in this chapter, the participating managers demonstrated a high level of awareness of global trends and issues concerning technological advancements that are shaping the business environment. The examples provided were from real-life experiences:

“Even for example, if you jump onto the app now, FNB app, you never have to be irritated by somebody's voice. You just process your stuff quicker wherever you are.” P2

“I was watching a documentary the other day about Kenya, the Masai woman and I think it's some tribe in Namibia, some indigenous tribe there. They still literally pound maize with that big thing. Three of them you know, so people still live like that. People still live according to Indigenous knowledge systems.” P3

“Uber is another thing where before you had to stand in the street, lift your finger up trying to find a taxi. Now you just call the taxi directly to where you are and you don't have to wait more than a few minutes and you don't have to worry about someone else jumping into the cab before you get a chance to open the door because you know they're coming specifically for you.” P5

“Insurance, for example, companies like Naked insurance which are brand new. They're fully digital, are taking over the older ones. Which are, you know, still a hybrid of the two.” P6

Collective experience: Except for 1, the middle managers that were interviewed had private sector experience that was either heavily reliant on customer service, investigative in nature, or required interaction with public entities as shown in the responses below:

“It was like sales consultant and call centre agents and that sort of thing. So it was different in a sense that on all my private sector experience I was like entry-level.” P1

“For three years it was 2005 to 2008, I worked as a journalist, a junior Journalist” P2

“So I was the person that was submitting the development applications on behalf of property owners. So I'd go to the municipality for assessment and approval. So I'm on the other side now. I'm the one who's doing the assessment and the post approvals.” P3

“I was a consultant so I was on the other side whereas now I'm internal. So we produced systems for clients. So now I'm the client, so that's the major difference”

P4

“I was a consultant my first ten years in South Africa? So that was private business, but it was still working with the government so that's why I say even I, I've kind of had a career that looks at more of a... I'm a civil servant, you know, that's what I do... when I came over here it was more of a bit more of developmental SMME support type of work. But through consulting with the government before I became an actual official myself.” P5

Mental models of management

The mental models describe the dominant logic that affects managers' decisions. These were assessed according to attitudes towards technology and change. When asked about their opinions on change and technology respectively, the participants showed a strong embracing culture for both change and technology.

Some participants associate change with progress:

“Well, I know that it's the only constant. It's something that I enjoy. It's something that I embrace. I run towards it. You know, I like to see how things can change. I like to watch them unfold. I like to influence how change unfolds as well but I'm always driving it. I'm always pushing barriers and I'm always canvassing or lobbying the bosses because they don't enjoy change as much as I do.” P1

“Without change, there's no growth. So you have to adopt change, adapt to change, and be willing to fail into change. If you keep proceeding in life trying to get things perfect, you were already failing. If you keep proceeding in life trying to get things perfect, you were already failing.” P5

“I think change is, is part of city development. I think you know there's never been a time in human history with change hasn't existed, so it's a reality. And it's something that we have to engage with to make sure that it is positive.” P6

Other participants associate the two concepts together:

“A key tool for the digital transformation or for the 4th Industrial Revolution that we find ourselves in. If you refuse to change, if you refuse to learn, then you become obsolete or the world spits you off and I'll give one example of the meter taxis and Uber. So the meter taxis are refusing to change, they are refusing to join the Uber business.” P2

“It's something that I pretty much welcome. Because things, systems change all the time, things change all the time. You know even now I was telling you just now ukuthi [that] when I got here we were still doing things manually but slowly but surely over the past two years we've tried to be more electronic.” P3

Technology is mainly associated with improvement of life and convenience:

“Every revolution comes makes our lives much easier. I mean we don't need to walk to Cape Town, we can just drive there, or better yet, we can fly there... So digital helps to remove those geographical barriers. And that's a big benefit.” P2

There was also some scepticism and concerns that individual participants usually consider when it comes to adopting the technology:

“I guess I'm on the fence on this one, you know? I could say because I'm more of like a naturalist you know I'm like an earthy type of person, like agriculture then plants and all of that. So that's my personal type, that's a person that I am but obviously in the career-wise and obviously even in my society, in my Community and whatever. But to be quite honest, yeah, I think there's a lot to technology that we don't know about because I mean, there are all of these things like artificial intelligence stuff that is not even, you know... I guess that it has started. It's still very like an infant concept at its infancy stage in South Africa.” P3

“I like technology. I interact with it. I think it has a great space in society. It simplifies our lives. So our life is easy. It's just obviously managing its consequences like social media can have on the... you know anyone for that matter. People get scammed and you know. So it's just a matter of managing it. It's got evil sides, I guess for lack of a better word. But I embrace technology.” P4

There was also an emerging reliance of people on technology where participants relied heavily on technology to run their daily lives:

“Since the late or the mid-90s, so it's becoming more and more an integral part of our lives as you know. Because you can't survive without your cell phone. I can't remember a meeting without my cell phone I had. I don't even wake up without my cell phone because it alarms me.” P5

“So for example, we live without technology we would never know how much food we need in a store and a particular area. We wouldn't know what clothing to put into a store in a particular area. You know, all of that is data-based, and even from a perspective of a government, how much money are you going to need in order to ensure that your infrastructure is maintained” P5

4.3. Summary of findings

The findings from the interviews with the six participants from the City of Johannesburg were presented in this chapter. First, it was shown that the management consists of a young team of managers with a rich learning culture and service record within the city. The findings were then presented according to the four propositions that were developed in the literature review.

Overall, the findings show that the city's digital transformation has been a gradual process with changing technology at a varying level of integration. It was also shown that digitalisation is rooted in the need to provide quick and efficient services to the public with limited resources. Upon assessing competency levels, it was shown that management has a vast set of interpersonal and technical skills and is knowledgeable about the technological trends globally. Lastly, the findings reveal that the managers generally embrace both change and technology. Table 4 summarises these findings as described.

The next chapter will discuss these findings in detail and apply the theoretical framework and literature as discussed in chapter 2 of this paper.

Table 4: Summary of findings from the interviews

Themes	Summary of findings
<p>The pace of digitisation describes how fast the process of digitising service delivery operations is taking place</p>	<ul style="list-style-type: none"> • Digitisation occurred gradually over a long period of time
<p>The evolution of technology refers to the changing nature of technologies and processes that have been implemented as part of the digital transformation of the City of Johannesburg</p>	<ul style="list-style-type: none"> • There were incremental changes to the technology and processes
<p>The degree of digitalisation explains how well the various digital technologies and systems are integrated into the service delivery operations</p>	<ul style="list-style-type: none"> • The city is decentralised • There are varying degrees of integration within departments of the city • Hybrid working model made up of digitised and manual processes. • Processes are not streamlined
<p>Service delivery objectives are those that are associated with providing adequate public</p>	<ul style="list-style-type: none"> • Achieving shortened turnaround times for service queries and developmental needs of the city • Creating efficient processes to better service stakeholders

<p>services for the benefit of the city's citizens.</p>	<ul style="list-style-type: none"> • Driving citizen engagement and satisfaction to improve service delivery and understand the needs of its residents
<p>Covid-19 pandemic is an additional insight that emerged from the responses</p>	<ul style="list-style-type: none"> • Reduce disruption time of operations
<p>Challenges facing management describes those changes that are inhibiting the progress of digitising operations as the City undergoes digital transformation</p>	<ul style="list-style-type: none"> • Processes relating to service delivery and internal operations within the city are old and inefficient • The technology is inadequate to accelerate the digital transformation • The people within the organisation are either resistant to change, or not equipped to adopt the new technological advances • There is a potential to digitally exclude some stakeholders • The political buy-in was identified as a major inhibitor against the implementation of new technology <p>Resources: The City of Johannesburg has limited resources</p>
<p>Management initiatives in response to challenges and digital transformation refer to the strategies employed by the middle management in the City of</p>	<ul style="list-style-type: none"> • Challenging stakeholder mindsets by various means of training, demonstrations, and piloting of transformation projects • Involving stakeholders and being cognisant of their norms to reduce resistance • Manage stakeholder concerns through negotiation and continuous communication

<p>Johannesburg to mitigate concerns around digitalisation</p>	<ul style="list-style-type: none"> • Some of the resource challenges were mitigated by directly getting involved in finding alternative sources of funds and resources, and also deploying non-invasive technology
<p>Outcomes of deployed strategies realised upon successful implementation of digital projects</p>	<p>Internal benefits:</p> <ul style="list-style-type: none"> • The city is benefitting from more efficient processes and efficient use of resources • The city is also having reduced interruption of operations • There is a better acquisition of reliable data whose integrity can be maintained for even better services • The digitisation of some services has enabled better analysis, thereby allowing the city is to provide more relevant services to its residents from the social media strategies <p>External benefits:</p> <ul style="list-style-type: none"> • The residents within the city are benefitting from more availability of systems needed to interact with the city • There are improved turnaround times for stakeholders to receive feedback • The city residents are the ability to collaborate with the city to solve their problems and possibly earn a living

<p>Managerial competency</p> <p>describes the combined skills, knowledge, experience, and understanding of digitalisation</p>	<p>Understanding of digitalisation:</p> <ul style="list-style-type: none"> • The participants associated the phenomenon to automation of processes for better performance and reduced processing time <p>Skills:</p> <ul style="list-style-type: none"> • Participants demonstrated a variety of interpersonal skills such as negotiation, communication, stakeholder management in managing the digital implementation. • The technical skills that emerged from the interviews include analytical ability, requirement analysis, and project management <p>Knowledge:</p> <ul style="list-style-type: none"> • Participants are collectively in possession of IT and non-IT-related qualifications, with most having postgraduate level. <p>Experience:</p> <ul style="list-style-type: none"> • Participants had private sector experience that was either heavily reliant on customer service, investigative in nature, or required interaction with public entities • The participants demonstrated a high level of awareness of global trends and issues concerning technological advancements that are shaping the business environment
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Mental models of management

describe the dominant logic that affects managers' decisions

- The participants showed a strong embracing culture for both change and technology.
- Some participants associate change with progress while others associate the change and technology together
- Technology is mainly associated with the improvement of life and convenience
- There was some scepticism and concerns that individual participants usually consider when it comes to adopting technology
- Some participants demonstrated high reliance on technology to run their daily lives

Chapter 5: Discussion of findings

5.1. Introduction

The City of Johannesburg is currently transitioning into a smart city to improve the quality of service delivery. However, there is limited understanding of how the current digital strategies are implemented. The study undertaken to address this knowledge gap revealed that there are varying levels of integration across the city's departments, which are characterised by a slow evolution of technological implementation, inefficient processes, limited resources, stakeholder resistance, and political barriers. It was further seen that various strategies were taken by the middle management to improve the level of digital integration into the service delivery operations, yielding some benefits for all stakeholders. This chapter discusses in detail the research findings in line with the literature review conducted.

The study consists of an overarching question and four sub-questions. A research proposition was developed for each of the sub-questions in chapter 2. Due to the interconnectedness of these propositions, the themes identified in chapter 4 will first be discussed in general before the propositions are addressed. The chapter will then conclude by providing a summary of the discussion and the conclusions drawn about the propositions.

5.2. Discussion

A deductive thematic analysis of the interview data was done from a human capital perspective. The analysis revealed that although the middle managers in the city understand the service delivery objectives, understand the opportunities presented by the digital technology, and are competent enough to enable digital integration, the state of digitalisation is still not uniform.

The participants during the semi-structured interviews revealed that digitisation was taking place in small increments over an extended period, hence the hybrid operational models relying on both digital and manual work. The processes are also not streamlined because of decentralised departments, where each one has its own IT and functional approach. However, the COVID-19 pandemic seemed to be an accelerant for improving the pace at which digitisation of specific activities takes place even with constraints arising from legacy technologies. It is widely discussed in digital transformation and digital maturity research that aligning the internal strategy with technological developments is a challenge for many organisations that rely on legacy technology (Teichert, 2019). Considerations should then be made to match skills, knowledge, and available resources for technologies to be implemented correctly (Arafah & Winarso, 2017; Holland et al., 2008; Lombardi et al., 2012; Nam & Pardo, 2011; Shapiro, 2006; Tan & Taeihagh, 2020).

Despite the differences in the types of services provided by each department, there is convergence towards urgency and efficiency to deliver on services. For example, the emergency call centre needs to respond to residents and dispatch emergency services, while the land development department needs to fast-track the processes to enable contractors to build clinics quicker. While this is evidence of a clear strategy, the varying

degrees of digitalisation across the departments are representative of the lower end of the fashionista organisation, where departments progress in silos (Westerman et al., 2014). The management of the city is therefore expected to creatively increase project and change management efforts to accelerate digitalisation in the lagging departments (Gulati & Reaiche, 2020; Sousa & Rocha, 2019; Thordsen et al., 2020). In line with this expectation, further analysis of the responses confirmed that middle managers in the city applied situational analysis before selecting an appropriate approach to each challenge as recommended. According to Teece (1997), the ability to respond appropriately enables the delivery of strategy. The classification of these responses is shown in section 5.3.

5.2.1. Proposition 1.1: The current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives.

The first sub-question was aimed at assessing the state of digitalisation in the City of Johannesburg. The data gathered showed that although digitalisation in the city is still in its early stages, some departments are more advanced in terms of automating the processes.

The evidence presented in chapter 4 and the application of Westerman's model agree with the argument that the current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives. This is attributable to the decentralised nature of the organisation causing misaligned approaches to digital practices.

5.2.2. Proposition 1.2: The objectives for digitisation in the City of Johannesburg involve improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery.

The second sub-question was aimed at identifying objectives for digitisation in the City of Johannesburg. Responses from participants showed that the city is aiming for an efficient way to deliver public services to all stakeholders at the shortest convenience.

Just as the COVID-19 pandemic accelerated digitisation, it has also highlighted the need for ensuring continuous availability of services. The participants referred to the disruption of operations during the lockdown period. As noted by many authors, digitisation is driven by external factors and rapidly changing environments to improve internal processes (Janowski, 2015; Ndaguba & Ijeoma, 2018; Saarikko et al., 2020). It is up to the city to respond appropriately by leveraging the correct digital technology to deliver on service delivery objectives (Bousdekis & Kardaras, 2020; Thordsen et al., 2020).

While it is true that digitisation in the City of Johannesburg is important for improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery, the empirical evidence from the study showed additional considerations. Reduced interruptions are essential for business continuity. In the context of the city this implies that in the digitisation of service delivery, management needs to be cognisant of the extent to which the internal processes and procedures affect the city's service output and prioritise accordingly.

5.2.3. Proposition 1.3: The strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery.

The third sub-question aimed to understand the effectiveness of digitalisation strategies employed for service delivery in the City of Johannesburg as seen by the city's management. The assessment of the strategies involved the identification of challenges facing middle managers, initiatives in response to these challenges, and the outcomes of the initiatives.

The premise that strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery is flawed. As previously discussed, middle managers are faced with diverse challenges. A combination of quality technical and soft skills was applied as recommended in literature to overcome such barriers and enable organisational change (Gulati & Reaiche, 2020; Janowski, 2015; Teichert, 2019). The evidence obtained from the interviews, therefore, shows that some degree of improvement in different departments was realised from these strategies. However, managers need support from the city's senior management to reconfigure certain processes and political influences to maximise the benefits that are achieved in silos.

5.2.4. Proposition 1.4: The level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate.

The last sub-question was thus designed to analyse the level of managerial expertise in integrating digital technology in the City of Johannesburg. A combination of education, competence, and mental models was assessed in this study. It was found that the middle managers of the City of Johannesburg have a variety of skills, a wealth of knowledge about other industries, a balanced combination of IT and non-IT-related qualifications, and positive attitudes towards technology and change.

The evidence from the interviews showed that the level of expertise of the city's middle management is adequate for integrating the digital technologies in service delivery operations at an individual level. As an example, the outcomes of the strategies as relayed by the managers are directly challenging the dissatisfaction in service delivery as discussed by Masiya et al. (2019) and Reddy (2016). Although this is an external benefit to the citizens, it was enabled by the alignment of service delivery objectives and the adoption of IoT to gain insights. This outcome is directly linked to the management's strategy to persuade internal staff to start using online surveys.

It is worth noting that management is limited by political and structural barriers from performing their duties. For example, the city having over 40 000 followers on Twitter is meaningless if the city's employees cannot engage. Furthermore, the management of the City of Johannesburg is struggling with political resistance against digitalisation even though the political and economic pressures are driving the need for digitalisation in the global context (Janowski, 2015; Ndaguba & Ijeoma, 2018; Saarikko et al., 2020). This

implies that there is an opportunity for the city to combine the expertise and increase synergy. Further, structural barriers and policies need to be reviewed to allow the expertise to remain effective and relevant.

5.3. Classifying managerial competency from a dynamic capabilities lens

It was found that the challenges faced by the city's middle management are an amalgamation of inefficient processes, archaic practices, organisational resistance, political influence, digital exclusion, and a deficit of resources as summarised in Table 4 of chapter 4. According to Caffrey and McDonagh (2017), managers are pivotal to aligning the municipal strategic objectives with evolving digital technology. This theory was confirmed from the observation that the management's analytical nature enabled the selection of appropriate technology and identification of efficient resource management strategies for each service delivery requirement. The set of competencies and experience demonstrated by participants as described in Table 4 are thus critical to elevate the level of digitalisation as described by Helfat and Martin (2014).

In addition to the digitisation component, middle managers are also responsible for driving and managing organisational change as the process progresses (Gulati & Reaiche, 2020). As seen from the findings presented in chapter 4, these are the competencies and expertise applied in addressing challenges that were inhibiting digitalisation. The rapidly changing nature of the environment as dictated by technological advancements and COVID-19 required adaptation and reconfiguration of the processes, practices, and the

organisation (Teece, 2007; Teece et al., 1997). Figure 5 is a dynamic capabilities framework showing how the set of competencies was applied in the digitalisation of the City of Johannesburg.

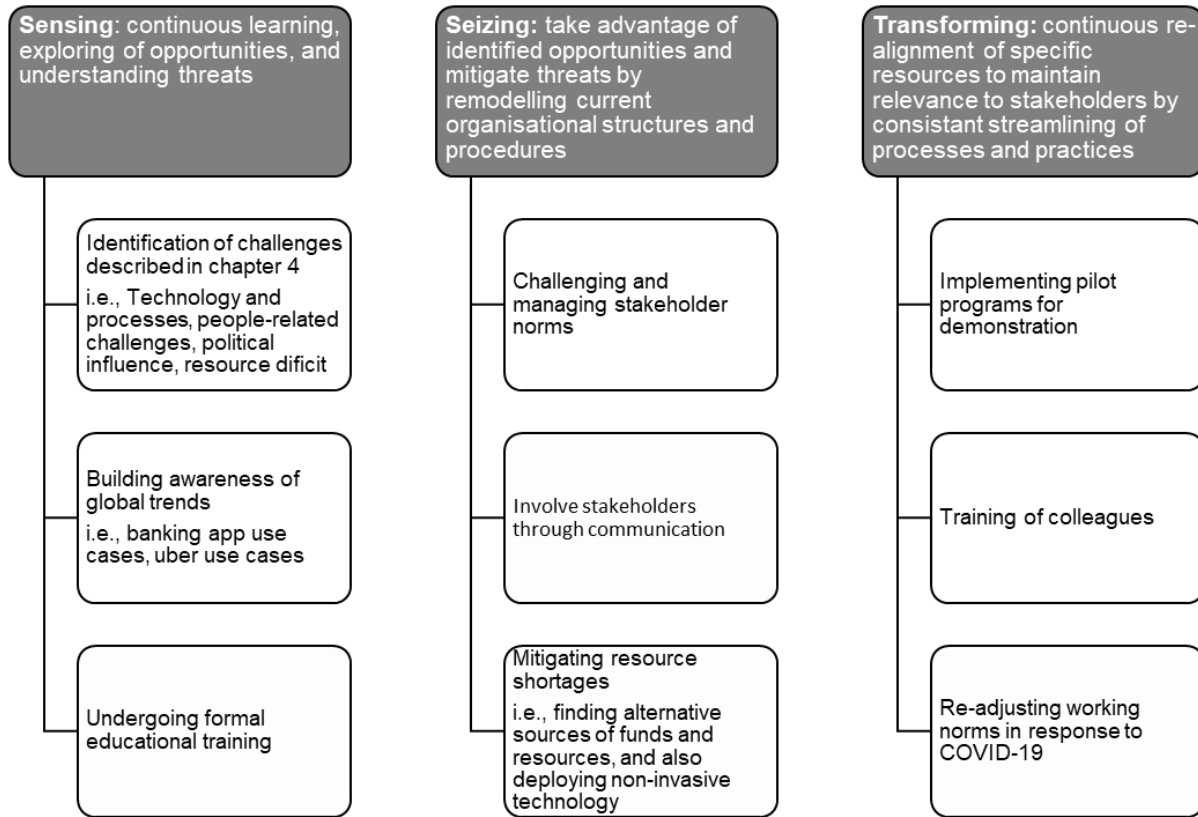


Figure 5: Managerial dynamic capabilities as applicable to the management of the City of Johannesburg. Adapted and modified from Armstrong and Lee (2020)

As noted in the findings, the participants were excited about technology and change. They also demonstrated extensive experience in customer service and interacting with the city. These characteristics explain the rationale to champion for digitalisation and being empathetic to citizen needs for convenience (Helfat & Martin, 2014; Kor & Mesko, 2013)

(Helfat & Martin, 2014; Kor & Mesko, 2013). Figure 6 depicts the relationship between mental models and decision-making.

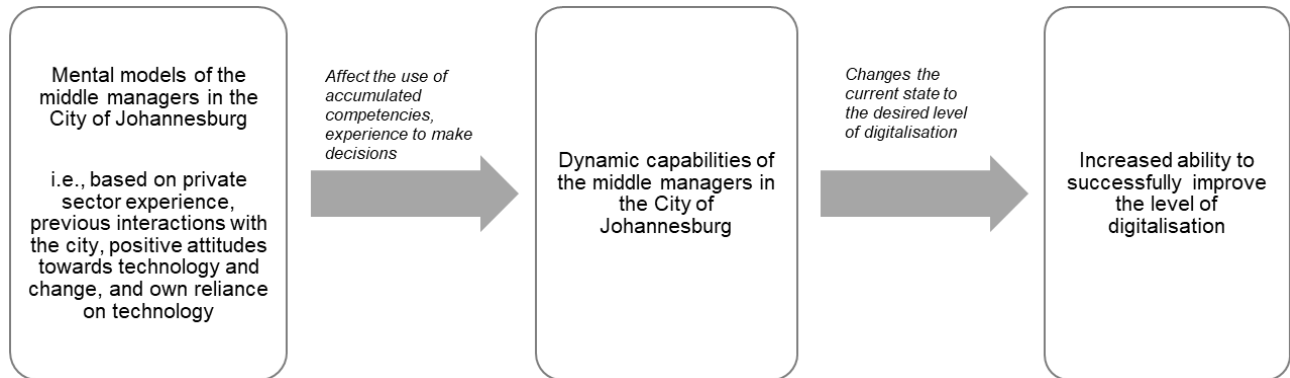


Figure 6: Application of mental models on decision making to improve the level of digitalisation (author's construction)

5.4. Conclusion

This chapter assessed and discussed the findings that were presented in chapter 4 by aligning them with the literature review. Overall, the discussion showed that the middle management within the city is pivotal to the digitalisation of public services. In each of the propositions discussed, it was evident that the individual efforts of the management contributed to aligning service delivery strategy, digital strategy, and the needs of the citizens. The research findings therefore aligned with human capital theories by confirming that the middle managers are pivotal to the overall digitalisation of the City of Johannesburg.

Proposition 1.1 stated that the current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives. It was determined in this chapter that this claim is true and is attributable to

the decentralised nature of the organisation causing misaligned approaches to digital practices.

The discussion led to additional conclusions regarding **Proposition 1.2** which stated that the objectives for digitisation in the City of Johannesburg involve improving internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery. It was also determined that reduced interruptions are essential for business continuity.

The premise that strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery is thus inaccurate as declared by **Proposition 1.3**. The evidence obtained from the interviews showed that some degree of improvement in different departments was realised from these strategies.

Proposition 1.4 stated that the level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate. The statement was found to be untrue. However, it was also shown that there is adequate expertise at an individual level.

The conclusions drawn from this chapter will be used to answer the overarching research question in chapter 6 through a dynamic capabilities lens, thereby providing practical and theoretical implications.

Chapter 6: Conclusions and recommendations

6.1. Introduction

It was established through an assessment of seminal papers that there is a limited understanding of how digital strategies are implemented in the digitalisation of the City of Johannesburg. This study thus addressed the knowledge gap through a qualitative study that aimed to explore the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg. A human capital perspective through a dynamic capabilities lens was applied in assessing the current state of digitalisation.

In chapter 5, the propositions for each sub-question were discussed independently of each other in the context of the literature review. The findings of the research are condensed in this chapter to link the propositions together, thus answering the research question. Figure 7 shows the relationship between the main and sub-questions. An updated view of the conceptual framework will be presented to reflect the findings of this study and summarise the conclusions. The chapter will then provide practical recommendations based on the findings, and finally outline suggestions for further study.

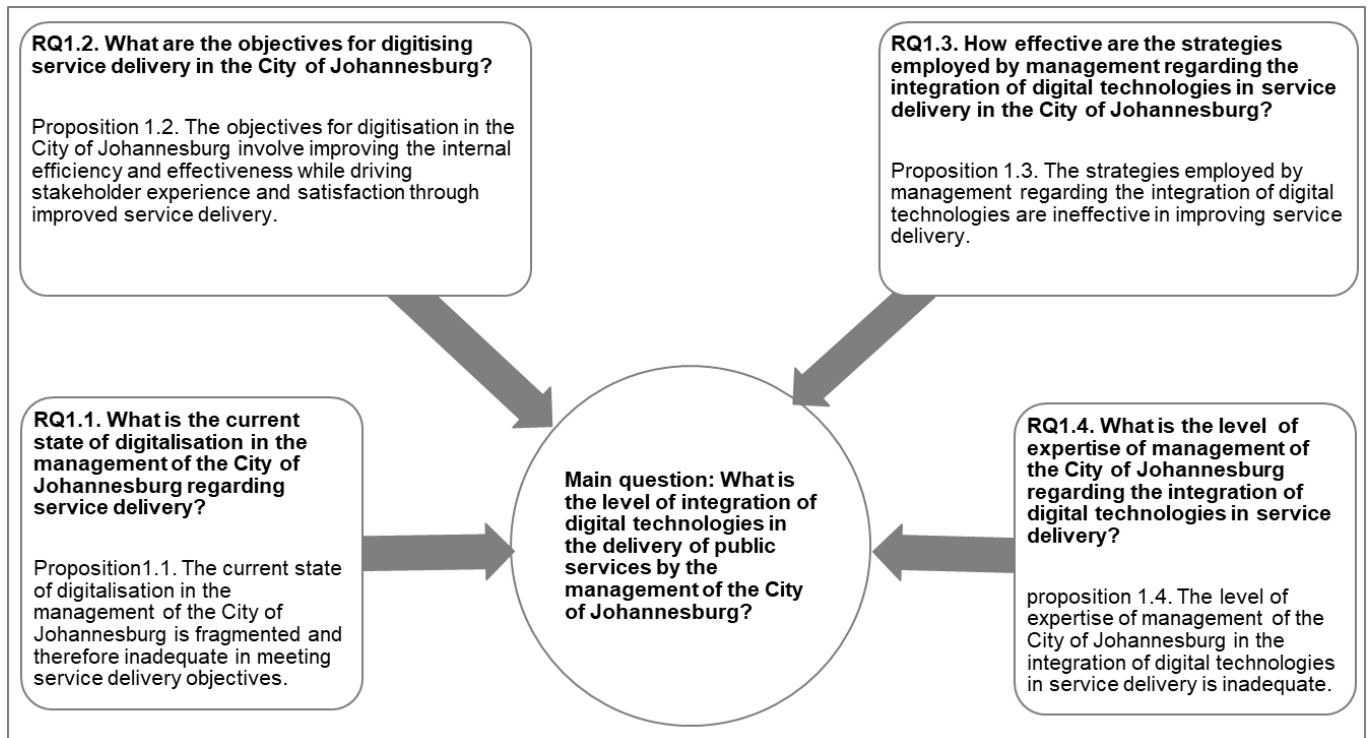


Figure 7: The relationship between the main and sub-question (author's constructions)

6.2. What is the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg?

This research question was aimed at assessing the level of integration of digital technologies with a specific focus on how human capital affects the integration of technology, thus affecting the digital maturity level. The previous chapter discussed in detail the components of this research question.

It was first determined through Westerman's digital maturity model that the city is classified as a lower-end fashionista, owing to its fragmented progress in digitalisation, inefficient processes, archaic practices, organisational resistance, political influence,

digital exclusion, and a deficit of resources. It was also observed from the interview responses that the middle managers understand the service delivery strategy and digital technology. Furthermore, the set of competencies and mental models, and the application thereof, of the middle managers were determined to be an enabler to digitalisation.

Analysis of the collected data revealed that the middle managers within the city have unique sets of competencies that are overlaid with positive attitudes around digital transformation. These characteristics enabled them to improve the level of digital integration and provide a roadmap to an advanced state. However, the city's inability to support its middle manager's efforts is the source of slow progress in integrating service delivery strategy with identified technologies. Figure 8 below represents the findings based on the relationship amongst the constructs assessed in the study which, as updated from the initial conceptual framework.

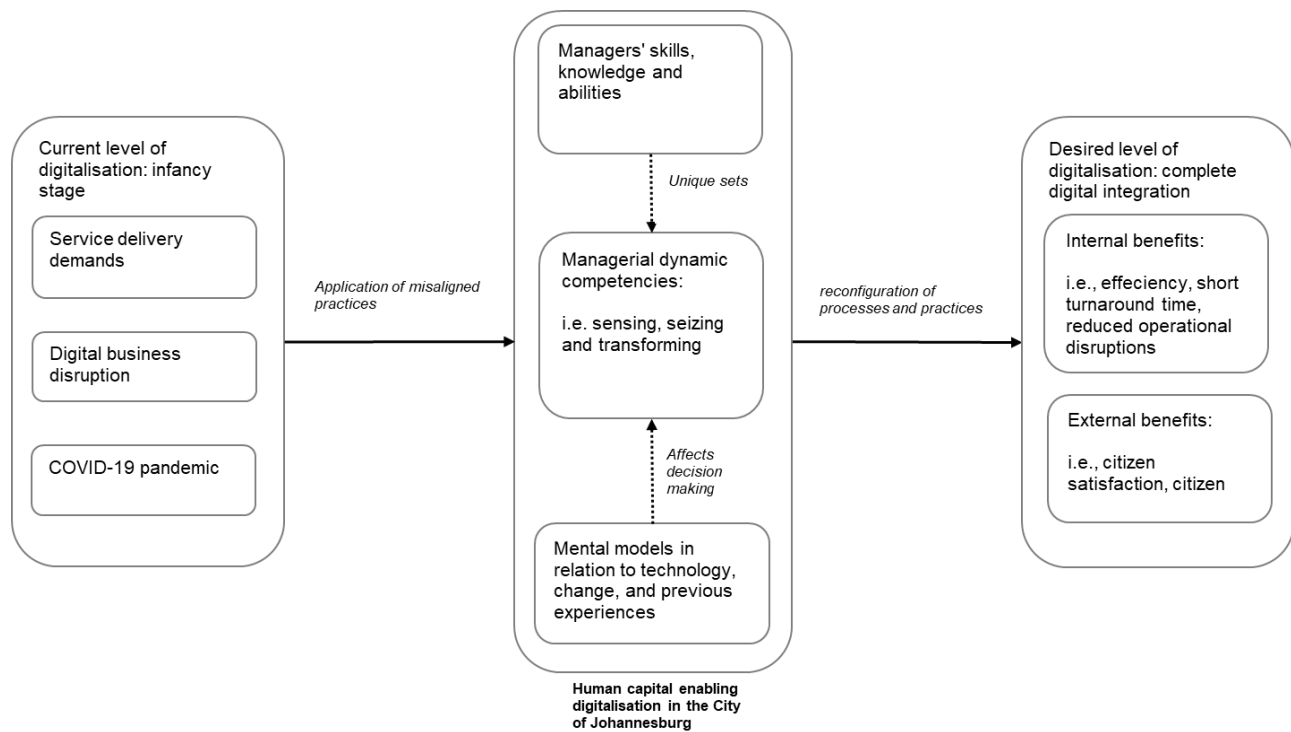


Figure 8: Updated conceptual framework showing the relationship amongst constructs (author's construction)

Overall, the level of integration of digital technologies to the delivery of public services is in its infancy. Although good technology and competent human capital exist, there is not enough support for the middle managers to execute strategy. It can be deduced from these findings that human capital alone is insufficient to improve digital integration. This study thus finds that while arguments on whether a new technology or human capital is attributable to digital maturity are valid, they are incomplete (Arafah & Winarso, 2017; Nam & Pardo, 2011; Tan & Taeihagh, 2020). These arguments are inconsiderate of the structural context of the city, the political aspect in particular. It is therefore the position of this report that all three components should be considered concurrently as a unit.

6.3. Recommendations

Based on the responses from the interviews and the literature, the managers had all the required competence and attitudes. However, it has been established that the state of digitalisation is fragmented even though the strategies are yielding positive results and the managers understand their objectives. This is due to the silo approach despite having similar service delivery objectives within departments. The below considerations need to be made as the city continues to digitise:

1. The level of digitalisation could be improved by aligning the strategies in various departments to discourage silo mentality.
2. Management needs to be cognisant of the extent to which the internal processes and procedures affect the city's service output and prioritise accordingly.
3. Managers need support from the city's senior management to reconfigure certain processes and political influences to maximise the benefits that are achieved in silos.
4. There is an opportunity for the city to combine the expertise and increase synergy rather than depend on individual efforts. The city must therefore promote a culture of collaboration amongst departments.
5. Structural barriers and policies need to be reviewed to allow the expertise to remain effective and relevant.

6.4. Suggestions for further research

This study was qualitative and consisted of fewer participants than anticipated. However, the insights provided a perspective on how the City of Johannesburg contributes to improving the digital maturity of the organisation as a whole. Further research may build on this knowledge by:

1. Performing a quantitative assessment of the level of integration so that the extent of the issues identified can be understood better.
2. Conducting a similar study in the wider Gauteng province with different levels of management to understand how their respective roles add value to the digitalisation process.
3. Undertaking a study from the perspective of citizens so that the impact of the contributions of management are understood from the perspective of all stakeholders.

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Appendix A: Interview guide

Participant information

My name is Kagiso. I am a Master of Management student in the field of Digital Business at Wits Business School. As part of my studies, I am required to conduct research. I intend to explore the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg.

As per the consent letter I sent earlier, I'd like to remind you that you are free to withdraw from the study at any time without any cost to you. I will be using a pseudo name to represent your responses in my report to protect your identity. Please do answer my questions as best and honest as you can. This session is being recorded and I will only be using it for data analysis and thereafter forward it to the university.

Request verbal consent: Would you still like to continue?

Commence interview

Part A: I would like to first talk about your background so that I can better understand your feedback. This is to ensure that I understand what influences your decision making.

Descriptive data	Question
Gender	1. <i>By observation</i>
Age group	2. Use age bracket such as 20 to 30 , 31 to 40 and so on rather than the exact age.
Educational qualification	3. What is your highest qualification? 3.1. What year did you obtain it?
Years in public sector	4. For how long have you been working in the public sector?
Years in service delivery	5. For how long have you been in your current role?
Job description	6. May you please provide me with an overview of your current role?
Private sector experience	7. Do you have experience in the private sector? If yes: 7.1. For how long did you work there? 7.2. How different was your role from your current one?
Experience with digital technology	8. What experience do you have working with digital technology?
Opinion on change	9. What is your opinion about change in general?
Opinion on digital technology	10. What is your opinion about technology in general?

Understanding of digitalisation	11. In your opinion, can you briefly explain digitalisation?
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Part B: I would like to find out how you integrate digital technology into your operations. Digital technologies are any of the 4IR ideas including digital channels that citizens are using to interact with you (Twitter, app, website), in-house automation, artificial intelligence, and others.

12. What is the state of digital integration in the operations of your organization?

13. What are your priorities in terms of service delivery?

13.1. What informs these priorities?

14. What digital technologies are you using to address service delivery priorities?

14.1. Whose initiative is it to use these?

14.2. What was your contribution to the implementation of the technology?

14.3. What benefits have you noticed since they were implemented?

14.4. What challenges have you noticed since they were implemented?

14.5. What lessons have you learnt in terms of improving service delivery?

15. How do you leverage the integrated technology to meet both your service delivery needs and internal processes?

Part C: I would now like to shift our conversation to how you managed your stakeholders when digital technology was implemented.

16. What concerns did your staff raise regarding digitisation?

16.1. How did you address these concerns?

16.2. What was the outcome of your intervention?

17. What concerns did your senior management have regarding digitisation?

17.1. How did you address these concerns?

17.2. What was the outcome of your intervention?

18. What concerns did your contractors have regarding digitisation?

18.1. How did you address these concerns?

18.2. What was the outcome of your intervention?

19. We have reached the end of our interview session, thank you for your time and participation. Do you have any questions for me?

I am reachable by email and cellphone if you have any concerns at a later stage.

Appendix B: Consistency matrix

Table 5: Consistency matrix linked to interview questions

Research question	Proposition	Interview questions	Data analysis method
Main question: What is the level of integration of digital technologies in the delivery of public services by the management of the City of Johannesburg?			
1.1. What is the current state of digitisation in the management of the City of Johannesburg regarding service delivery?	1.1. The current state of digitalisation in the management of the City of Johannesburg is fragmented and therefore inadequate in meeting service delivery objectives.	Questions 11, 12 & 14	Thematic analysis
1.2. What are the objectives for digitising service delivery in the City of Johannesburg?	1.2. The objectives for digitisation in the City of Johannesburg involve improving the internal efficiency and effectiveness while driving stakeholder experience and satisfaction through improved service delivery.	Question 13	Thematic analysis
1.3. How effective are the strategies employed by management regarding the integration of digital technologies in service delivery in the City of Johannesburg?	1.3. The strategies employed by management regarding the integration of digital technologies are ineffective in improving service delivery.	Questions 12 -17	Thematic analysis
1.4. What is the level of expertise of management of the City of Johannesburg regarding the integration of digital technologies in service delivery?	1.4. The level of expertise of management of the City of Johannesburg in the integration of digital technologies in service delivery is inadequate.	Questions 1-11, 15-18	Thematic analysis

