



Leadership Challenges in Implementing Digital Transformation Initiatives: A Case Study of Local Government Leaders in the City of Johannesburg

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Abstract

Municipalities within local government serve an important role in South Africa's public service delivery, highlighting the importance of strong public sector leadership (Dube, 2013). The Fourth Industrial Revolution (4IR) reinforces this foundation by requiring public sector leaders to proactively adapt through digital transformation, innovation, and stakeholder engagement to effectively lead their organisations.

Despite the growing interest in digital transformation, local government is constrained by institutional, financial, and capacity limitations that hinder the effective adoption and expansion of digital technologies. Such constraints limit municipalities' ability to respond to citizen expectations and the uptake of 4IR technologies, thereby undermining efforts to improve service delivery through digital transformation.

The aim of this study is to examine the challenges faced by local government leaders in implementing digital transformation initiatives within the City of Johannesburg. The study adopted a qualitative research design. Fourteen leaders were purposively selected and interviewed from the City of Johannesburg (CoJ), Gauteng. Findings revealed internal organisational challenges, such as the lack of technical skills and an ageing workforce, rigid governance processes, resistance to change, restrictive policies, and information delays, which were identified as barriers to digital transformation. The study also identified external pressures that complicate 4IR implementation, such as organised labour and stakeholder resistance. Finally, the lack of systematic training initiatives emerged as a critical gap. While participants acknowledged the importance of upskilling, financial constraints, limited resources, and fragmented delivery hinder progress. The findings underscore the need for context-sensitive leadership strategies, capacity-building programmes, and policy frameworks to enable effective digital transformation.

Keywords: Digital transformation; Fourth Industrial Revolution technologies; Leadership challenges; Local government leaders.

1. Introduction

Leadership in the local government and its effects on the provision of public services have drawn considerable attention (Orazi, Turrini & Valotti, 2013; Van Wart, 2003; 2013; Vogel & Masal, 2015). While political leaders are formally responsible for overseeing public services, local governments increasingly assume greater administrative responsibilities at the operational level due to expanded discretionary authority (Vogel & Masal, 2015). Although most public service leadership methods emphasise the agency of public employees, social justice and moral purpose, which are not specific to leadership in the public sector, remain an essential component of public service leadership (Van Wart, 2013; Vogel & Masal, 2015).

Leadership in the public sector entails managing complex stakeholder interactions under conditions of resource constraints and strong ethical obligations, in addition to broader elements that influence leadership. Effective leadership in this context is characterised by the ability to foster stronger positive relationships, provide a clear strategic direction aligned with public value, uphold ethical conduct, and engage in collaborative engagement. In South Africa, where municipalities are central to service delivery, these leadership qualities are essential (Dube, 2013).

Municipalities fulfil an important role in South Africa's public service delivery, highlighting the importance of strong public sector leadership (Dube, 2013). The Fourth Industrial Revolution (4IR) further reinforces this need by requiring public sector leaders to adapt proactively through digital transformation, innovation and stakeholder engagement to effectively lead their organisations (Dube, 2013). According to Madumo (2015), the 4IR, characterised by rapid technological advancement, has significantly accelerated citizen expectations regarding government interaction, responsiveness, and the quality of public service delivery. As a result, public sector leaders must ensure that decision-making aligns with rapidly evolving public needs, and that regulatory frameworks remain agile (More Ickson & Manda, 2021).

Adie et al. (2024) underscore that digital leadership encompasses technological literacy and transformational competencies, which are crucial for navigating digital government complexity. Similarly, Mkhize et al. (2024) emphasise that leadership underpinned by ethical conduct and public interest is critical for addressing persistent service delivery challenges in the 4IR era.

The aim of this study is to examine the leadership challenges faced by local government leaders in implementing digital transformation initiatives within the City of Johannesburg. Specifically, the study seeks to understand the required competencies, identify internal and external barriers, and explore strategies for enabling the effective adoption of 4IR technologies to improve service delivery.

This study aims to answer this question: What leadership challenges do local government leaders face in implementing digital transformation initiatives within the City of Johannesburg, and how do these challenges influence the adoption of Fourth Industrial Revolution (4IR) technologies for improved service delivery?

1.1 Background to the study

The National Development Plan (NDP) 2030 is the South African government's roadmap for public service delivery, and it places local government at the centre of advancing and implementing efficient, effective, and inclusive service delivery throughout the nation (National Planning Commission [NPC], 2013). The main priorities of President Cyril Ramaphosa's sixth South African democratic administration, as stated in 2013, include the rebuilding and renewal of a capable developmental state, with an emphasis on leveraging Fourth Industrial Revolution (4IR) technologies to enhance citizen service delivery. This involves using 4IR more effectively to deliver citizen services. The country's first democratic administration, led by Nelson Mandela, was followed by Thabo Mbeki and Kgalema Motlanthe, and subsequently by Jacob Zuma in the fourth and fifth administrations (National Planning Commission [NPC], 2013).

The Khawuleza District Development Model (DDM) was unveiled by President Ramaphosa in his 2019 Budget Speech. It is a "One Plan One Budget and One Space" framework designed to integrate collaborative planning, budgeting, implementation, monitoring, and evaluation in all government areas (Department of Cooperative Governance and Traditional Affairs [CoGTA], 2020). The Khawuleza DDM includes 52 geographical areas, comprising eight metropolitan regions and 44 regional districts

that serve to establish strategic alignment between the national, provincial, and local levels of government (CoGTA, 2020; South African Local Government Association [SALGA], 2019).

The White Paper on Local Government of 1998 states that “local government is empowered and capacitated to play a developmental role” (Republic of South Africa, 2018). The DDM outlines a framework for spatial transformation implementation in both urban and rural areas, while advocating long-term infrastructure planning and resource sustainability, integrated service delivery, enhanced public participation, and strengthened monitoring and evaluation mechanisms (Bughin et al., 2017).

The One Plan focuses on the integration and coordination of programmes and initiatives across all spheres of government (national, provincial, and local). The “One Plan, One Budget and One Space” approach seeks to align and consolidate development initiatives implemented by government, private sector (corporate), and civil society organisations within each district, metropolitan, and local municipality. The district hubs play a central role in coordinating, facilitating, and monitoring stakeholder activities within each geographic area (Ekuma, 2017; SA, 2018).

The present administration’s strategy focuses on the local government sector, as guided by the Medium-Term Strategic Framework (MTSF) 2019–2024 (Department of Planning, Monitoring and Evaluation [DPME], 2021). The MTSF 2019–2024 advances South Africa’s developmental agenda as articulated in the National Development Plan (NDP) 2030. It is structured around three pillars: the creation of (i) a competent developmental state, (ii) an inclusive economy, and (iii) service delivery. The NDP 2030 plan prioritises economic transformation, the establishment of a capable developmental state, the promotion of jobs, the consolidation of social wages through the provision of basic services, education and health, encouraging safe communities and social cohesion, and the construction of a better world (DPME, 2021; NPC, 2013).

The growth of municipal authorities as a distinct sphere of government is supported by various influential stakeholders. Notably, the Municipal Infrastructure Support Agent (MISA) plays a strategic role in strengthening municipal capacity to enhance service delivery. MISA’s strategic goal is to support municipalities in improving their planning capacity, infrastructure maintenance, refurbishment, and project implementation capabilities (Mnguni, 2020). In this context, MISA’s technical assistance strengthens the ability of municipalities to increase citizens’ access to services according to the MTSF goals, while ensuring the optimal functioning and sustainability of existing infrastructure systems. Furthermore, MISA plays an oversight and support role in the implementation of the DDM (Mnguni, 2020).

2. Problem Statement

Academic studies in the local government sector have increasingly focused on leadership and its complex nature, particularly the formation of leaders’ identities and their ability to build multifaceted relationships with stakeholders to drive meaningful change for improved citizen well-being (Haywood et al., 2019).

As South Africa navigates socio-economic challenges and advances towards the Fourth Industrial Revolution (4IR), effective local government leadership, grounded in digital transformation capabilities and practical competencies, is critical for guiding innovation and fostering a digitally inclusive society (Mirhosseini et al., 2013; SITA, 2020). However, despite this imperative, the local government sector continues to face criticism for inadequate service delivery, largely attributed to leadership weaknesses (Fourie & Poggenpoel, 2017).

These leadership deficiencies have contributed to widespread and recurring service delivery protests, reflecting growing public dissatisfaction with municipal performance and accountability (Akinboade, Mokwena & Kinfack, 2014; Ndasana et al., 2022). Furthermore, the sector is constrained by systemic challenges, including institutional inefficiencies, financial limitations, and capacity deficits, which collectively undermine its ability to effectively implement and scale digital technologies.

As a result, municipalities face significant barriers in responding to citizen expectations and adapting to the increasing adoption of 4IR technologies, thereby limiting the potential of digital transformation to enhance service delivery outcomes. This gap highlights the urgent need for strengthened leadership capacity and institutional reform to support sustainable, technology-driven service delivery within the local government sphere.

2.1 Scope of the study

This study examines leadership challenges in the implementation of digital transformation initiatives within the local government context, focusing specifically on the City of Johannesburg (CoJ). It explores the leadership competencies required in the Fourth Industrial Revolution (4IR). The study is limited to municipal leaders and senior officials within the CoJ and excludes other metropolitan municipalities and private sector organisations. Emphasising leadership perspectives rather than technical implementation, the study aims to inform policy development, capacity-building initiatives, and leadership frameworks to support effective digital transformation in local government (Adie et al., 2024).

3. Literature review

3.1 Local government leadership

Municipalities in South Africa play a central role in advancing the national development agenda and strengthening democratic governance within municipalities. Their mandate extends beyond basic service level delivery and enhancing citizens' well-being (Warner & Sullivan, 2004). This underscores the importance of leadership skills as a determinant of local government performance.

Local government employees perceive local government leaders to be a decisive factor influencing the success or failure of public service delivery. Leadership is expected not only to guide organisational performance, but also to shape ethical standards, accountability, and institutional culture (Collins & Jackson, 2015:386). Local government employees believe that the lack of proper service delivery and any destruction of the local government are signs of poor and unethical leadership.

Recent studies highlight that South African municipalities continue to face systemic challenges, including financial constraints, skills shortages, weak strategic planning, and political interference, all of which undermine service delivery (Tshishonga, 2021; Hofisi & Chigova, 2023; Mutereko et al., 2024). Such challenges are related to a lack of finance, land, and human capacity – assets that lie at the heart of service delivery. Weak deployment of incompetent human resources (HR) and a lack of strategic thinking and operations contribute to depriving the public of quality services (Ndlovu, 2016). Municipalities still face several challenges emanating from skills shortages, poor public participation, and poor governance, and political interference is rife. Poor leadership remains a major constraint, as leadership practices directly shape organisational effectiveness, accountability, and service delivery outcomes (Ndlovu, 2016). However, framing municipal failure solely in terms of individual leadership deficits risks overlooking broader structural and institutional challenges. In a global context, the transition from traditional bureaucracy to New Public Management and, more recently, digital

governance has intensified these challenges and redefined leadership challenges, requiring leaders to adopt innovative strategies and transformational leadership approaches (Mangai & Ayodele, 2025).

In South Africa, municipalities are mandated to develop Integrated Development Plans (IDPs), which outline five-year strategies for service delivery. While IDPs are intended to promote participatory governance and integrated development, their implementation is often undermined by administrative fragmentation, limited stakeholder engagement, and weak leadership capacity (Nkuna, 2007; Kotzé & Venter, 2010). The increasing complexity of governance – characterised by overlapping mandates, multiple stakeholder interests, and digital transformation pressures – further intensifies these challenges.

Emerging research underscores the importance of digital leadership competencies, which combine strategic vision, technological literacy, and the ability to drive organisational change (Mutereko et al., 2024; Hofisi & Chigova, 2023). However, a critical gap remains in understanding how these competencies can be operationalised in practice, particularly in municipalities facing infrastructural deficits and digital divides. This suggests the need for a more nuanced and context-sensitive approach to leadership development. It is critical for municipalities to adapt to the Fourth Industrial Revolution (4IR) and deliver inclusive, citizen-centric services.

3.2. Digital transformation and 4IR in Local Government

Service-delivery practices in local government are undergoing rapid transformation, driven by persistent service-delivery inefficiencies and rising citizen expectations (Ogada et al., 2016). In response, municipalities are increasingly embracing digital transformation as a strategic imperative. At the centre of this shift is the Fourth Industrial Revolution (4IR), characterised by advanced digital technologies such as digital platforms, artificial intelligence, and automation, which collectively enable more efficient, responsive, and citizen-centric governance (Mhlongo, 2024).

Within this context, the 4IR refers to digital transformation and integration of advanced digital technologies into economic, social, and governmental systems (Schwab, 2016). Technologies such as the Internet of Things (IoT), cloud computing, robotics, and big data analytics are reshaping public sector institutions by expanding the possibilities for innovative service delivery and participatory governance (Schwab, 2016; Xu, David & Kim, 2018). However, these technological advancements do not operate in isolation; they place significant demands on leadership to manage complexity, uncertainty, and organisational change.

In the public sector, the 4IR is redefining not only service delivery mechanisms but also leadership roles and competencies. Increasing citizen expectations for efficiency, transparency, and digital engagement, require leaders to move beyond traditional administrative functions towards more adaptive and transformational leadership (Mhlongo & Thomas, 2024). Digital leadership in this context involves the ability to align technology with organisational goals, foster innovation, and create enabling environments for digital adoption. Furthermore, Mhlongo and Thomas (2024) point out that e-government comprises e-service, and e-citizen engagement and e-democracy serve as critical instruments through which leaders can enhance service delivery outcomes and strengthen democratic engagement. In line with Mhlongo's (2024) emphasis, citizen-centred digital transformation emphasises participatory governance through digital platforms, thereby reinforcing accountability and transparency (Boudebouz et al., 2025; Mhlongo, 2024).

South Africa has made policy commitments to advance digital governance, notably the South Africa's National e-Government Strategy, which was established in 2017 (Department of Communications and Digital Technologies [DCDT], 2020). According to the draft paper, the plan aims to maximise citizen

service delivery, providing 24-hour accessibility to government resources and services. To this end, President Ramaphosa stated that South Africa's prosperity as a country is dependent on its capacity to fully capitalise on fast technological progress (SA Government, 2018). This implies that South Africans must urgently work towards improving their skills in science, technology, and innovation.

Complementary initiatives, such as the National Digital and Future Skills Strategy (2020), further highlight the importance of building technological capabilities within the public sector. These frameworks underscore a broader recognition that the country's developmental trajectory is increasingly tied to its capacity to harness digital innovation. The strategy outlines three strategic actions: (i) investing in digital and innovation skills through Sector Education and Training Authorities (SETAs); (ii) including digital and cybersecurity skills in employee training learning programmes; and (iii) focusing on strategy implementation through evaluation and monitoring mechanisms (Hooker et al., 2020). However, policy ambition alone is insufficient without effective leadership to translate strategy into implementation.

The success of digital transformation initiatives is highly contingent on leadership capacity. Effective digital transformation requires considerable financial, human, and technical resources, all of which must be aligned to achieve effective outcomes. It also necessitates the use of leaders capable of managing digital change and influencing the process (Dahlström, Desmet & Singer, 2017; Draper et al., 2019). Despite this, existing research indicates that many public sector leaders lack the technical understanding and competence required to oversee such development. When the leadership style does not fit with the leadership needs of a digital transformation plan, the implementation of the plan may be unsuccessful, and this could have a detrimental influence on organisations for years to come (Allio, 2015; Gupta, 2018; Sow & Aborbie, 2018). This gap reinforces the argument that leadership is not merely a supporting factor but also a central determinant of digital transformation success or failure.

While digital transformation improves service delivery through enhanced efficiency, improved data-driven decision-making, and better citizen engagement, it is also inherently complex and multifaceted. At the municipal level, digital initiatives often involve the integration of organisational processes, data systems, and stakeholder interactions (Sibanda et al., 2020; Wessel et al., 2021). However, recent studies cite that digital transformation within local government is complex and multifaceted, encompassing socio-political, organisational and technical dimensions. Moreover, the complexity of 4IR technologies demands leaders with digital literacy, strategic foresight, and the ability to foster a culture of innovation (Mangai & Ayodele, 2025). However, within this context, leaders have to contend with skills shortages, ageing workforce dynamics, limited financial resources and resistance to change and policy rigidity (Mutereko et al., 2024; Hofisi & Chigova, 2023).

3.3. Theoretical Framework

The application of leadership theory within local government remains contested, particularly in relation to its practical relevance in complex and resource-constrained environments. Although leadership has been extensively studied, there remains a persistent gap between theoretical models and their practical applicability, especially within the public sector (Ndlovu, 2016). Many leadership theories are developed in stable, well-resourced organisational contexts and therefore fail to account for the institutional, political, and socio-economic realities that characterise South African municipalities. This limitation reduces their usefulness for practitioners, who are often required to respond to dynamic and unpredictable challenges, such as political interference, governance instability, and service delivery backlogs.

Local government operates within a highly complex system shaped by competing stakeholder interests, regulatory constraints, and capacity limitations. As a result, leaders frequently rely on adaptive, flexible, and situational approaches, rather than strictly adhering to prescribed theoretical models. This suggests that leadership in local government should be understood not as a fixed set of traits or behaviours, but as a context-dependent practice that evolves in response to institutional realities. In response to these limitations, this study adopts public sector leadership theory and transformational leadership theory as analytical frameworks. These approaches are particularly relevant because they address both the structural and relational dimensions of leadership. However, rather than assuming their universal applicability, this study critically examines their relevance within the South African municipal context, where structural constraints may limit their effectiveness.

This study's theoretical contribution lies in extending existing leadership frameworks by demonstrating how leadership practice in local government is shaped and constrained by contextual realities associated with digital transformation in the Fourth Industrial Revolution (4IR). The study contributes to the emerging field of digital leadership by highlighting the limitations of traditional transformational leadership models in capturing institutional, political, and socio-technical dynamics of 4IR adoption in the public sector.

3.3.1. Public Sector Leadership Theory

Public sector leadership is widely recognised as a critical driver of organisational change and achieving effective governance and service delivery outcomes. Effective leadership in the public sector is essential for implementing reforms, improving service delivery, and ensuring that government agencies can adapt to the ever-changing socio-economic environment (Van Wart, 2013). Leadership within government institutions plays a vital role in shaping policies, guiding organisational culture, and influencing the performance and accountability of public servants (Moynihan & Pandey, 2005).

There has been increased attention on leadership in public service and its impact on public service delivery (Orazi et al., 2013; Van Wart, 2003; 2013; Vogel & Masal, 2015). Despite the surge in interest in the area of leadership research, public sector leadership literature remains scarce. The literature reveals a gap between the growing importance of leadership in practice and its relatively limited theoretical development within public administration (Orazi et al., 2013). While practitioners increasingly emphasise leadership as a key determinant of service delivery performance, academic research has historically focused more on structures, processes, and policies than on leadership dynamics. This disconnect limits the ability of existing frameworks to fully explain leadership effectiveness in complex governance settings. Furthermore, public sector leadership is inherently constrained by structural and institutional factors. These include limited resources, bureaucratic rigidity, political interference, and regulatory compliance requirements (Vogel & Masal, 2015). The public sector leadership theory provides a useful lens for understanding governance complexity, but it must be applied critically and contextually. Its effectiveness depends not only on individual leadership capabilities but also on the broader institutional environment within which leadership is exercised.

3.3.2. Transformational Leadership

Transformational leadership has become important as a framework for understanding how leaders drive organisational change, innovation, and performance in dynamic environments (Bass & Riggio, 2006). The theory emphasises visionary leadership, motivation, intellectual stimulation, and individualised consideration as key mechanisms through which leaders influence followers and achieve organisational goals. According to Jawoosh et al. (2021), transformational leadership theory emphasises the human connection between leaders and followers. In other words, it is concerned with establishing trust and

rapport between a leader and their subordinates. Transformational leadership is focused on the relationships between leaders and followers (Lamb, 2013). According to Robbins and Judge (2016:3), transformational leaders are “leaders that inspire followers to go beyond their self-interests and are capable of exerting a large and exceptional effect on followers”. In essence, transformational theory blends idealised influence, intellectual stimulation, motivation, and personal care (McCleskey, 2014). Asbari et al. (2020) assert that transformational leadership involves leaders and followers working collaboratively to promote the organisation’s overall performance. These leaders encourage their subordinates to prioritise the organisation’s objectives above their own. Under these circumstances, it is vital to enhance the needs of followers (Akbari et al., 2019). In essence, transformational leadership philosophy combines idealistic influence, intellectual stimulation, motivating desire, and individual attention. This style of leadership demonstrates core leadership characteristics, such as charm, customised concern, and intellectual stimulation.

In the context of local government, transformational leadership is often presented as a desirable approach due to its potential to inspire change, improve employee performance, and enhance service delivery. However, its applicability within the public sector remains subject to debate. Unlike private organisations, municipalities operate under significant constraints, including limited financial resources, bureaucratic regulations, and political oversight (Moynihan, Herd & Harvey, 2014).

The South African local government context presents additional challenges that may limit the effectiveness of transformational leadership. These include skills shortages, financial constraints, governance failures, and socio-economic inequalities. Under such conditions, the expectation that transformational leadership alone can drive improved service delivery may be overly optimistic. Instead, a more integrated approach is required, where transformational leadership is adapted to local realities and complemented by strong institutional frameworks.

4. Research Methodology

The study adopted a qualitative research design, which is well-suited for exploring complex social phenomena and generating rich, contextual insights (Flick, 2020). Positioned within the interpretivist paradigm, the research acknowledges that reality is socially constructed, and emphasises understanding participants’ subjective experiences (Saunders, Lewis & Thornhill, 2023). Prior to conducting the study, ethical approval was obtained from the Milpark Business School Research Ethics Committee.

Semi-structured interviews were drawn from the City of Johannesburg (CoJ) Metropolitan Municipality and the South African Local Government Association (SALGA, 2019). Fourteen selected participants included individuals involved in SALGA-led training initiatives, who were willing to participate in the study. To conduct data analysis, the researcher followed Braun and Clarke’s (2006) approach, adopting both inductive and deductive coding strategies for theme identification. The data were imported into ATLAS.ti (Version 8) to support systematic coding and data management. The trustworthiness of the study was enhanced through member checking and triangulation of interview transcripts with field notes to strengthen credibility. Dependability was ensured through the maintenance of a detailed audit trail documenting analytic decisions and theme development processes (Braun & Clarke, 2023).

4.1. Results

4.1. Leadership for Digital Transformation

Participants conceptualised leadership as a multifaceted capability combining strategic, human-centred, and technological competencies. Leaders were described as individuals who guide and influence others through a shared strategic direction. As one participant noted, a leader is “*Someone who influence[s]*

others and guide[s] them in a shared strategy, help[s] employees reach their full potential and inspires employee loyalty." (P1). Another participant noted that *"a leader should be someone who really appreciates information intelligence, so they can take a forward step of taking leading initiatives that bring solutions... one that appreciates both the technology and the human side of things."* Additionally, participants alluded to the transformational nature of leadership. Participants highlighted that Participants associated effective 4IR leadership with the capacity to navigate complexity and ambiguity, innovation, proactiveness: *"Leadership should be innovative and be able to be proactive on introducing new ways of working, handling complexity and ambiguity, strategic planning, oversight, and vision for the future."* (P2).

Furthermore, participants emphasised the ability to combine technological awareness with human sensitivity, indicating that effective leadership in this context extends beyond inspiration to include socio-technical integration. *"A leader should appreciate both technology and the human side to bring solutions"* (P8), echoing the need to balance technology and social realities to enable successful digital transformation. Finally, participants echoed that during periods of change, such as digital transformation.

Collectively, these views echo that in evolving and uncertain and complex landscapes, leadership in the 4IR context should be adaptive, transformational, requiring leadership that is strategically proactive, and possesses the ability to leverage technology with human centredness. These findings align with transformational leadership, which emphasises inspiration, vision, and intellectual stimulation as drivers of organisational change (Bass & Riggio, 2006; Trottier, Van Wart & Wang, 2008). These qualities are amplified by the need for technological literacy, strategic agility, and inclusive decision-making (Dahlström, Desmet & Singer, 2017; Draper et al., 2019). The findings point to a shift towards adaptive and context-responsive leadership, where technological literacy and strategic agility are as critical as relational competencies. This highlights a limitation in conventional leadership models, which often underplay the operational realities of digital transformation in resource-constrained public sector environments.

4.2 Leadership Competencies Required for 4IR

Participants identified several competencies required for 4IR, including communication, vision, innovation, and change management. In response, participants echoed that leadership competencies required are *"[...] someone who would be able to have effective communication. This would assist in conveying very important information of digitisation and making the stakeholders aware of the importance of introducing the new ways of working, which is the Fourth Industrial Revolution [...]"* (P2). These competencies reflect the increasing complexity of leadership roles in digitally transforming organisations. For example, the emphasis on communication extends beyond information sharing to include the ability to translate complex digital concepts into actionable organisational change.

Another stressed, *"Leadership that is capable of transformation and change, that can influence people and follow ways of doing things [...]"*(P7). Whereas (P6) stressed, *"A bold leadership is needed in taking risk; leadership that will paint an image of the future, where we are going. To be able to articulate the vision which is based on current local realities and must understand the context, from which the industrial revolution emerges [...]"* These views align with transformational leadership, comprising vision and inspiration as drivers of organisational change (Bass & Riggio, 2006; Trottier et al., 2008).

Importantly, participants also highlighted that digital awareness competencies are critical to enable leaders to translate technological possibilities into service delivery improvements. Participant 13 echoed

“An individual who will assist people in transforming from the old ways of doing things to new ways of doing things, who is technical, a leader who is able to transform [...]”, and “Leadership that is able to manage new processes efficiently, a leader who is able to innovate [...]” (P14). These views align with Dahlström et al. (2017) and Draper et al. (2019), who highlighted that transformational leaders need to combine strategic agility with operational competence. This suggests a departure from traditional leadership expectations, where technical expertise was often secondary to managerial skills.

These findings challenge conventional leadership theory by demonstrating that digital competence is no longer optional but central to effective leadership practice. The ability to manage uncertainty, mitigate resistance, and enable digital adoption reflects a more practice-oriented and contextually embedded understanding of leadership, particularly within municipal environments characterised by institutional constraints (Van Wart, 2013; Orazi et al., 2013).

4.3. Internal Organisational Challenges to Digital Transformation

The findings reveal that internal constraints that hinder adaptation to 4IR were reflected on by the participants. These challenges point to deeper structural and cultural limitations within municipalities. Participants emphasised the lack of technical skills and an ageing workforce as major barriers: *“Technology challenges, lack of technological skills [...]”* (P2), and *“Ageing workforce, born before technology, and a lack of knowledge of operations of technology”* (P4). Participants further alluded to, in their view, a misunderstanding of 4IR concepts and resistance and hesitance in adopting new methods and innovations. Further slows adoption: *“Misunderstanding of the concept of 4IR and the changes it brings”* (P6), and *“Ageing workforce, born before technology, and lack of knowledge of the operations of technology [...]”*.

Similarly, rigid governance processes, resistance to change, restrictive policies, and information delays were additional barriers identified by the participants. The findings illustrate the tension between bureaucratic compliance and the need for innovation. Participant 7 echoed, *“Policies and processes (legislation) are another challenge which needs to be focused. These have to be followed, especially when changing from one system to another.”* Participant 7 further commented on *“Resistance and hesitance in adopting new methods and innovations [...]”*. These findings reveal that while such structures are necessary for accountability, they can inadvertently limit flexibility and responsiveness, which are essential for digital transformation.

Finance is another major internal issue mentioned by participants, with Participant 12 mentioning *“Financial constraints, such as insufficient budget [...]”, and “In changing or embracing Fchange, even when there is no disruption, there might be an issue of funding, which is needed for implementation of a system or project [...]”* (P7). Participants expressed frustration with information delays, with Participant 8 echoing, *“Most leaders don’t have the luxury of having information at the right time.”* These findings suggest that internal barriers are deeply rooted in organisational culture and structural limitations, echoing literature on capability gaps and bureaucratic rigidity in public sector digital transformation (Van Wart, 2013; Orazi et al., 2013). This supports existing literature on bureaucratic rigidity, but also extends it by demonstrating how these constraints manifest, specifically within 4IR implementation efforts.

4.4. External Environmental Challenges to Digital Transformation

Beyond internal constraints, participants highlighted several external factors that complicate digital transformation, including organised labour and stakeholder resistance. *“Resistance by organised labour (trade unions)”* (P2), and *“Interest groups, citizens, civic groups... concerned about how changes will disrupt systems such as job security”* (P7). While resistance from organised labour and civic groups is

often framed as a barrier, it also reflects legitimate concerns around job security and equitable access to digital services. This suggests that digital transformation is inherently contested and requires careful stakeholder management rather than purely technical solutions.

Infrastructure limitations, particularly unreliable electricity supply and high internet costs, further constrain digital readiness. *“Electricity supply is another external challenge which could make the transformation to the digital age difficult. Another issue is expensive internet connection, which [is expensive and] needs to be reduced so as to enable digital transformation [...].”* (P6). These challenges illustrate the structural inequalities that shape digital transformation outcomes in developing country contexts.

Furthermore, participants expressed concern about global competitiveness creating exclusion: *“Striving for global competitiveness creates exclusion when basics like electricity and internet are lacking for the majority”* (P6). Civic groups and citizens voiced fears about job security. Finally, the absence of enabling policies was noted: *“There needs to be an enabling environment created by the municipality, such as policies and regulations”* (P14).

These external challenges mirror findings in global research on e-government adoption, where socio-economic inequalities and infrastructure gaps constrain digital readiness (Dahlström et al., 2017; Draper et al., 2019). Addressing these barriers requires multi-stakeholder engagement, investment in infrastructure, and inclusive policy frameworks to ensure that digital transformation does not exacerbate existing inequalities.

4.5. The importance of training and capacity-building for digital transformation

While participants widely acknowledged the importance of training and capacity-building, they highlighted significant shortcomings in implementation. Participant 2 echoed, *“No, there is no infrastructure, and the lack of financial resources, as the financial resources are mainly available for basic services, and the huge salaries in the sector are unable to generate additional revenue to fund this initiative due to a lot of jobs lost during the COVID-19 [...].”* Others noted that existing systems are ineffective. Participant 4 noted, *“No, we are not there yet. There is a system, but it is not functional [...].”* This suggests that capacity-building is not being implemented as a strategic priority.

The emphasis on generational gaps further highlights the need for differentiated training approaches. Where training exists, it is often fragmented and targeted at specific demographics, leaving older generations particularly vulnerable: *“Training and support need to be targeted at a particular demographic. There should be a need for older generations to be trained concerning the risks and issues related to components of the 4IR. Such trainings could emphasise security measures relating to internet usage or ICT, especially with the older generations, and younger generations as well, so as not to fall victim to cybercrimes, for instance [...].”* (P6).

Constraints, such as limited funding, inadequate infrastructure, and a lack of trained personnel, further undermine these efforts. Concerns about sustainability and resource constraints were common: *“There is not enough training available, which is originally based on space availability, non-availability of teachers, time and availability of trainees”* (P14). This aligns with literature emphasising that capacity-building is a critical enabler of successful digital transformation in public sector organisations (Dahlström et al., 2017; Draper et al., 2019). Without systematic investment in training programmes, local governments risk perpetuating skills gaps and resistance to change, undermining the potential benefits of 4IR.

These findings suggest that without sustained and systematic investment in capacity-building, municipalities risk perpetuating existing inequalities and resistance to change. This reinforces the argument that training should be embedded within broader organisational transformation strategies rather than treated as a standalone intervention.

5. Discussion

The findings of the study reveal that leadership in the context of digital transformation within local government is both multidimensional and complex, requiring an integration of digital competency and a blend of transformational leadership as critical drivers of organisational change (Bass & Riggio, 2006; Trottier et al., 2008). Participants highlighted that in evolving and in uncertain and complex landscapes, leadership in the 4IR context should be adaptive and transformational, requiring leadership that is strategically proactive. However, the study also underscores that these qualities should be amplified by digital awareness and the need for technological literacy, strategic agility, and inclusive decision-making. This aligns with the growing expectation that public sector leaders act as change orchestrators, capable of translating technological possibilities into actionable strategies for service delivery improvement (Dahlström et al., 2017; Draper et al., 2019).

The study also highlighted internal organisational challenges, such as the lack of technical skills and an ageing workforce, as a major barrier to digital transformation. In addition, rigid governance processes, resistance to change, restrictive policies, and information delays were identified as additional barriers. These findings suggest that internal barriers are deeply rooted in organisational culture and structural limitations, echoing literature on capability gaps and bureaucratic rigidity in public sector digital transformation (Van Wart, 2013; Orazi et al., 2013). Beyond internal constraints, participants reflected on external pressures that complicate 4IR implementation, such as organised labour and stakeholder resistance. These external challenges mirror findings in global research on e-government adoption, where socio-economic inequalities and infrastructure gaps constrain digital readiness (Dahlström et al., 2017; Draper et al., 2019).

Finally, the lack of systematic training initiatives emerged as a critical gap. While participants acknowledged the importance of upskilling, financial constraints, limited resources, and fragmented delivery hinder progress. This finding reinforces the argument that capacity-building is a cornerstone of successful digital transformation, and without it, local governments risk perpetuating resistance and underperformance. This finding reinforces the argument that capacity-building is a cornerstone of successful digital transformation, and without it, local governments risk perpetuating resistance and underperformance. These insights contribute to the literature by contextualising transformational leadership within the realities of 4IR and offering practical recommendations for leadership development, policy reform, and capacity-building strategies.

6. Recommendations

The findings of this study highlight the need for more adaptive, context-sensitive, and digitally competent leadership within South African municipalities. The practical implementation of these changes requires clearer prioritisation and operational strategies within municipal structures.

6.1 Prioritise Digital Skills Development

Municipalities should implement structured and role-specific digital skills development programmes rather than broad, generic training initiatives. This includes embedding continuous professional development programmes focused on 4IR capabilities, partnering with institutions such as SALGA to standardise digital skills frameworks across municipalities and devising competency-based training

aligned to specific job functions such as data management, digital service delivery and e-governance systems. To adapt to the changing workplace, the World Economic Forum (2017) advises that human resource training and retraining be prioritised. The 4IR demands a new generation of talented, imaginative, and tech-savvy people (Manda & Backhouse, 2017:3). Thus, the general public sector should have workers with the ability to match the newest technology revolution to capitalise on opportunities and anticipate 4IR dangers (Naudé, , 2017). Manda and Backhouse (2017:1) suggest that digital preparedness helps the government capitalise on possibilities and overcome digital transformation problems.

6.2 Strengthen Digital Leadership Capacity

Municipalities should formalise digital leadership roles and responsibilities to enable leaders to manage skills deficits, guide workforce transitions, and ensure that digital transformation supports organisational skills. Leadership thus operates as a critical mediating mechanism between technological potential and governance outcomes.

6.3 Adopt Digital Transformation Models

Local government must adapt existing digital governance models to align with local socio-economic and institutional realities, and undertake thorough needs assessments before adopting new technologies, thereby reducing the risk of misalignment between imported systems and local needs. Furthermore, digital transformation efforts must be supported by broader systemic governance reforms. This includes enhancing accountability and transparency mechanisms to mitigate corruption, improving financial management practices to ensure sustainable investment in ICT infrastructure, and strengthening collaboration between national, provincial, and local government structures to enable coordinated and effective implementation of digital initiatives.

7. Conclusion

This study examined leadership challenges in the implementation of digital transformation initiatives within the local government context, focusing specifically on the City of Johannesburg. It explored the leadership competencies required in the Fourth Industrial Revolution (4IR). The study also highlighted internal organisational challenges, such as the lack of technical skills and an ageing workforce, rigid governance processes, resistance to change, restrictive policies, and information delays, which were identified as barriers to digital transformation. In addition, the study highlighted external pressures that complicate the implementation of 4IR initiatives, such as organised labour dynamics and broader stakeholder resistance. Finally, the lack of systematic training initiatives emerged as a critical gap. While participants acknowledged the importance of upskilling, financial constraints, limited resources, and fragmented delivery hinder progress.

Although the potential benefits of 4IR for service delivery are substantial, these findings demonstrate that successful digital transformation is contingent upon transformational leadership, strategic agility, and inclusive capacity-building. By addressing these barriers through targeted leadership development, policy reform, and sustained investment in infrastructure and training, local governments can unlock the transformative potential of digital technologies to improve service delivery outcomes.

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