Enablers and barriers to public innovation: A case of local government spheres in KwaZulu-Natal, South Africa

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Abstract

The South African democratic dispensation faces challenges due to a lack of public innovation. After 30 years of democracy, the overall impact is under scrutiny. This study contributes to ongoing debates regarding the role of public administrators in post-apartheid public transformation, particularly in the context of public innovation. Guided by the multi-level perspective technology, organisation, actors, institutions, and systems (TOADS) theory and qualitative data collection methods, the study explored the enablers and barriers to digital transformation in eThekwini Municipality. Seven senior city officials and three community members were purposely sampled and interviewed in depth. Thematic analysis of the qualitative data identified the enablers of and barriers to public innovation. Technological infrastructure emerged as a policy enabler, while barriers included flawed bureaucratic systems, poorly implemented public innovation plans, unmonitored policies, delayed decision-making processes, resistance to change, and risk aversion. These barriers threaten the realisation of Section 151 of the Constitution of the Republic of South Africa Act 108 of 1994 and undermine good governance and the effectiveness of local municipalities. The study proposed an improvement plan that eThekwini Municipality should adopt to expedite public innovation for its citizens. The study asserted that the strength of South Africa's democratic dispensation hinges on public innovation aimed at accelerating service delivery for all citizens. In this context, public innovation is crucial for enhancing the quality of public services and strengthening the government's problem-solving capabilities, including accelerating electronic government (e-government) to expedite service delivery.

Keywords: Public innovation, legislative framework, barriers, accountability, digital transformation

Introduction

This paper describes a study that examined the enablers and barriers to public innovation in local government municipalities, in KwaZulu-Natal, South Africa. The study aimed to identify the challenges and opportunities the municipalities face in implementing innovative practices, particularly in the context of digital transformation and service delivery. The paper outlines the study's background, research aims and objectives, literature review, theoretical framework, and the methodology, followed by a discussion of key findings. These findings highlighted the factors that support public innovation and the obstacles that hinder its realisation, offering valuable insights for enhancing public service delivery and promoting effective local governance.

Background

Local government is vital for delivering services that directly impact citizen's daily lives, and a vision of becoming paperless is imperative for decentralised spheres of government. Furthermore, the local government sphere is a realisation of a democratic dawn. Mabunda Mvunabandi and Chonco (2023, p. 639) highlight that the majority of municipalities previously experienced service delivery delays, and these affected the intentions of the democratic dispensation. Political infighting has negatively impacted decision-making, leading to protests over poor service delivery, primarily caused by financial mismanagement and compromised governance.

As the Auditor-General of South Africa (AGSA 2023), Mathiba (2021), Meyer and Neethling (2023), and Mish, Mbaleki and Mushonga (2023) indicate, South African municipalities have faced significant financial mismanagement, which questions the efficacy of good governance and political oversight. Corruption has drastically lowered South Africans' living standards and undermined public service delivery. Since 2019, the AGSA reports have flagged municipalities for alarming financial mismanagement. Examples include R21 million spent on consultants without value evidence, R125.59 million spent on an incomplete integrated rapid public transport network project with a contract value of R3.48 million, and a lack of proper infrastructure maintenance plans impacting water and electricity supply. Singh (2023) & Mish

et al. (2023) outline that this mismanagement has led to investigations into most Metros, districts and local municipalities for poor governance, financial mismanagement, and city uncleanliness.

Public innovation and digital transformation are key. eThekwini Metro in Durban, KwaZulu-Natal, recently won a Special Achievement in Geographic Information System (SAG) Award at Esri's Annual International User Conference in San Diego, California (held on 15–19 July 2024). The city's Information Management Unit (IMU) received this award for the property management system developed by the IMU Corporate GIS Department. The system maintains the city's property data, feeding into other systems such as valuations, zoning, and billing. This coordinated management ensures a single source of property data for the municipality.

According to Budryte, Rakšnys, Valickas and Vanagas, (2020), public innovation is a process where government organisations address specific social challenges by developing new services, technologies, organisational structures, policies, and governance processes. This definition aligns with the intentions of Section 151 of the Constitution of the Republic of South Africa Act 108 of 1996 (Republic of South Africa 1996). Furthermore, Wegrich (2019) and Lam and Li (2018) explain that public innovation involves implementing new products, processes, and technological innovations that encourage citizen participation in service delivery. This bottom-up approach to decentralise governance promotes participatory involvement, develops trust and accelerates the resolution of social problems.

Institutionalising democracy and decentralising government involve empowering local governments to manage their affairs while upholding constitutional principles. Section 151 of the Constitution empowers municipalities to make by-laws and govern community affairs within national and provincial legislation bounds. This local autonomy is essential for fostering a democratic environment where community needs are addressed effectively. Provincial governments are crucial in monitoring and supporting municipalities, ensuring they fulfil their constitutional responsibilities as outlined in Schedules 4 and 5.

This governance framework creates an environment respecting individual rights and economic freedoms. Section 22 of the Constitution, which states that “Everyone has a right to freedom of trade, occupation and profession” (Republic of South Africa 1996, p. 14), underscores the broader democratic values that local governance aims to support.

Local government is responsible for service delivery, operates independently and is not subordinate to national or provincial governments. Instead, it functions as an autonomous

sphere of government with its own set of powers and responsibilities, as Section 151 of the Constitution outlines. According to this regulation, local government has the right to govern its affairs, subject only to national and provincial legislation as provided in the Constitution. While local government must work within this legislative framework, it retains the authority to make decisions, manage community affairs, and implement policies tailored to the specific needs of its community. This autonomy ensures that local governments can effectively address local issues, prioritise service delivery, and respond directly to the unique challenges of their constituencies without undue interference from higher levels of government.

Good governance involves the executive arm of government being accountable to the electorate by explaining and justifying its decisions and actions. This accountability is crucial for fostering public trust and creating an environment where innovation can thrive. Mhlanga, Thusi and Moloi (2023) argue that public innovation is pivotal in refining the quality of public services and enhancing the government's problem-solving capacities. By permitting and encouraging innovation, governments can accelerate development, improve efficiency and effectiveness, and better respond to citizens' needs.

The digitalisation of public administration is increasingly vital in achieving good governance as society demands more transparent and accessible public services through information and communication technologies. Nel-Sanders and Thomas (2022) argue that the Fourth Industrial Revolution (4IR) brings significant implications for both the public and private sectors, including digitisation, data reform, ethical considerations, and policymaking. Thusi, Mahlatshe and Matyana (2023) note that public innovation and digitalisation enhance the efficiency and responsiveness of government services and play a crucial role in addressing broader sustainability and development challenges.

Ndebele and Enaifoghe (2024) and Syukur and Muin (2023) describe public innovation as the ‘new normal’ in rendering public services. This term refers to a situation or state of affairs that has become standard or expected, particularly after a significant change or disruption. In this context, it implies that public innovation is no longer an exception but a standard approach to delivering public services. This recently established standard challenges conventional wisdom and disrupts established practices within specific contexts, promoting digitalisation opportunities. The agenda includes enhanced public administration, technical and business management, and human and social sciences. Thus, as the current paradigm, public innovation

requires fundamental changes in public servants' mindsets and how public institutions operate to accelerate service delivery.

Sirait, Rosalina and Sari (2023) argues that digital technologies create opportunities for integrating knowledge management, leadership, and innovation. Leadership in the digital era involves leveraging digital tools to manage knowledge strategically. Pawar and Dhumal (2024) state that digital innovation promotes sophisticated technologies to improve processes and reduce costs. Digital transformation can potentially drive improvements in public institutions, although the public sector often struggles with innovation adaptation compared to the private sector. Therefore, research exploring enabling technologies for public sector digital transformation is crucial.

In 2023 the eThekwini Municipality launched its e-governance initiative to go paperless, using digital tools to facilitate seamless interaction between the city and residents. An application (app) was tailored to meet the needs of all municipal units, with plans to introduce more features gradually. This tool, developed by the Sizakala Customer Services Unit, is set to introduce new features later this year, including bus, waste collection, and tanker schedules. This mobile app has been hailed as a game-changer. The City's mobile app has been shortlisted for the prestigious Centre for Public Service Innovation finals (CPSI) awards, a government programme designed to incentivise and promote innovation in the South African public sector, which recognises innovations that have significantly improved service delivery.

However, despite this digital innovation in the public sector, local government municipalities face persistent service delivery delays, political infighting, financial mismanagement, and compromised governance. Pillay and Mutereko (2022) argue that local government municipalities have failed to ensure service delivery, address corruption, and reduce unemployment. These issues have led to poor service delivery and undermined the municipalities' ability to fulfil their constitutional responsibilities, creating a pressing need to explore how public innovation can address these challenges.

Although some municipalities have made some strides, such as launching e-governance initiatives and winning awards for technological achievements, these efforts have not yet resolved the underlying issues of mismanagement and flawed governance. Therefore, this study endeavoured to identify the enablers and barriers to public innovation in local government municipalities to suggest policy recommendations. It sought to determine what has inhibited

public innovation from supporting decentralised governance and acknowledging citizens' voices in local government municipalities.

Research aim and objectives

Research aim

The study aimed to determine the enablers and barriers to public innovation in local government municipalities in KwaZulu-Natal, South Africa.

Research objectives

To achieve the research aim, the following objectives were formulated:

1. Identify enablers of public innovation within the municipality.
2. Examine barriers hindering public innovation.
3. Evaluate the impact of innovation on service delivery.
4. Propose policy recommendations to enhance public innovation.

Literature review

Digital innovation in public administration

Zervoudi (2019) explains that technological innovations have become accepted as the prevailing approach in recent decades. While these innovations are generally welcomed for their potential to improve human life, they have also raised concerns about the future, particularly regarding how underdeveloped countries will keep pace. Another concern is the rise of artificial intelligence (AI), which has been misinterpreted as a threat that could lead to unemployment. Such fears are not new – the 19th and 20th centuries saw major waves of technological progress accompanied by similar concerns. These technological advancements have historically created jobs, fully compensating for those displaced by job-saving technologies.

Mhlanga et al (2021) argue that stimulating public sector innovation through digital technology has implications for all parts of government, including operational agencies, regulatory authorities, and oversight bodies. Moreover, hybrid approaches, such as combining traditional in-person services with digital platforms and e-government solutions, must reflect citizens'

needs and aspirations. Furthermore, these approaches provide multiple channels for accessing public services, ensuring that all individuals, including those with limited digital literacy or access to technology, can benefit from government initiatives.

By integrating online services with physical support centres, governments can create inclusive systems adaptable to various community needs, enhancing overall accessibility, responsiveness, and user satisfaction. This dual approach would ensure that public service delivery is efficient and equitable, catering to the diverse preferences and circumstances of the population (Mhlanga et al. 2021).

National digital strategies can bridge digital divides and ensure respect for human rights, providing equal access to digital technologies and services for all citizens, regardless of socio-economic status, geographic location, or educational background. Investing in digital infrastructure, enhancing digital literacy programs, and ensuring affordable internet access would bridge the gap between those with access to digital resources and those without (Mhlanga et al. 2021).

These authors also state that national digital strategies can safeguard human rights by implementing policies that protect privacy, freedom of expression, and data security in the digital realm. They can establish frameworks to prevent the misuse of technology, such as surveillance, data breaches, and cyber harassment. Promoting ethical standards and regulations would ensure that technological advancements do not infringe upon individuals' rights but empower citizens and enhance their participation in a democratic society (Mhlanga et al. 2021).

Mhlanga et al. (2021) further claim that rapid developments have significantly influenced the past three decades of information and communication technology (ICT). The advent of the internet, alongside new hardware devices and software applications, has dramatically changed processes and lifestyles for citizens and organisations. Additionally, the emergence of technologies such as AI, cloud computing, and big data (large-scale data analysis) has created new societal demands on governments while offering new opportunities to meet these expectations more efficiently.

Digitalisation in public administration is crucial because everyone, at some point, needs to interact with public services. Addressing digital capacity deficits among public servants and political leaders is essential, although they need not be digital technology experts. International and local research institutes have explored the necessity and possibility of digitally transforming public administration. Dunleavy, Margetts, Bastow and Tinkòer (2009)

emphasise that “a range of connected and information technology-centred changes will be critical for the current and next wave of change”, leading public administration to shift towards digital-era governance.

National digital strategies should prioritise developing and procuring domestic technologies and software to empower countries and enhance their digital sovereignty. However, a challenge arises in middle- and low-income countries, where the digital brain drain – loss of skilled tech professionals to more developed regions – remains a significant concern. To address this, Dunleavy et al. (2009) argue for the need to support and accelerate the deployment of end-to-end technologies, which are comprehensive solutions covering all aspects of digital processes, from development to final implementation. By ensuring seamless integration and efficient operation across all stages, these technologies can drive structural changes in the economy, foster the creation of new industries and businesses, and advance the production and services within the ICT sector. By focusing on developing local technologies and retaining skilled professionals, national strategies can more effectively build robust digital economies.

Innovation transformation

Innovation transformation in public services involves navigating a complex landscape of enablers and barriers to adopting new technologies and methods. The literature identifies “supportive, flexible management”, “trust in the project team”, and “agile approaches” as three significant enablers of knowledge sharing at the organisational level; however, technological barriers often hinder this process (Lutwana, Dlulane, Pillay, Hassan and Grobbelaar: 2024). Attewell (1992) and Ardichvili (2008) highlight poor technological knowledge and resistance to technology adoption as key obstacles that prevent effective knowledge sharing within the public sector.

Kallio, Lappalainen and Tammela (2013) delve into innovation in public services by examining two interlinked dimensions: the target and the radicalness of the innovation. They develop co-innovation models from a user-driven perspective, focusing on two distinct processes: planning-oriented and rapid experimenting. In the planning-oriented process, a collaborative environment is fostered, where learning occurs with the users, emphasising mutual dialogue and respect for each other's competencies and experiences.

This approach necessitates a learning process in which users and service providers engage, leading to better understanding and innovation. Conversely, the rapid experimenting process empowers users by allowing the city to learn directly from their novel ways of innovating and

delivering services. This approach involves active engagement with users adopting innovative practices into service production and delivery (Kallio et al. 2013).

These co-innovation processes underscore the transformative potential of innovation in public services, demonstrating how mutual respect, collaboration, and continuous learning can serve as powerful enablers. At the same time, they highlight the need to address barriers such as technological resistance and knowledge gaps to realise the potential of innovation fully.

To provide an understanding of these dynamics, Figure 1 illustrates the enablers of and barriers to innovation in public services as indicated by the literature. The figure summarises how supportive management, trust, agile approaches, and user-driven co-innovation processes are enablers, while poor technological knowledge and resistance serve as barriers. Furthermore, the figure illustrates the enablers and barriers to public innovation across three main categories: individual, organisational, and technological.

Figure 1 therefore presents a detailed view of the factors that can enable or inhibit innovation within an organisation, showing that successful innovation depends on a combination of individual, organisational, and technological factors.

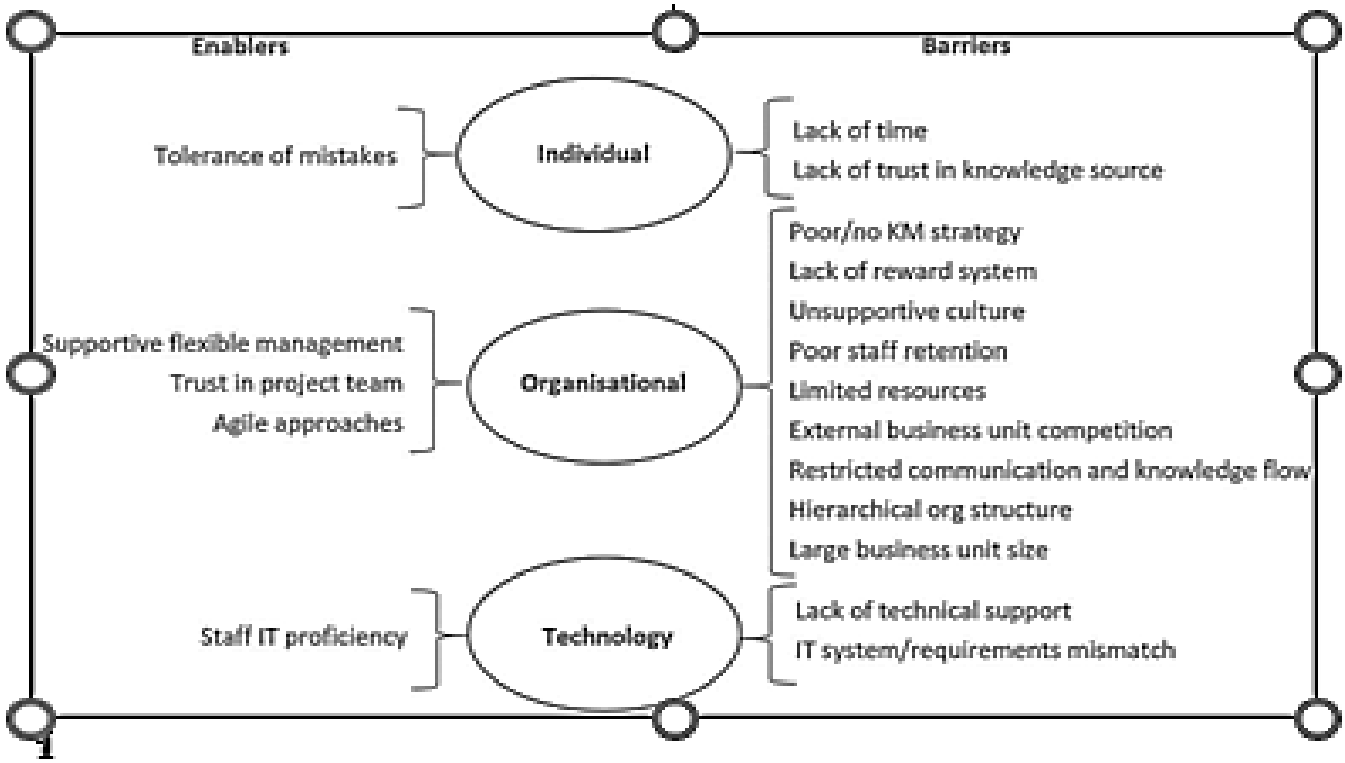

Figure 1: Enablers and barriers to knowledge sharing in public sector ICT project development (from Riege 2005)

The figure shows that at the individual level, tolerance of mistakes is seen as a critical enabler, suggesting that creating an environment where errors are accepted as part of the learning process can drive innovation. Conversely, barriers such as a lack of time and trust in knowledge sources can hinder the adoption of innovative practices. When individuals feel rushed or sceptical about the information they receive, they are less likely to engage in or support innovative efforts.

Factors such as supportive, flexible management, trust in the project team, and agile approaches are significant organisational enablers. Management that adapts to change and supports innovation initiatives can create a culture where new ideas thrive. Trust in the project team allows for more effective collaboration, while agile methodologies offer flexibility, helping organisations adapt to challenges and evolve their processes. However, several barriers can impede innovation at this level, including the lack of a coherent knowledge management strategy, a reward system, and an unsupportive organisational culture. Poor staff retention and limited resources exacerbate these issues, while competition between business units can obstruct collaborative efforts. Restricted communication channels, hierarchical structures, and

large business unit sizes contribute to the fragmentation of knowledge and slow the implementation of new ideas, stifling the organisation's ability to innovate effectively.

From a technological perspective, the proficiency of information technology (IT) staff plays a crucial role as an enabler. When employees are skilled in using technology, they can more effectively implement and leverage new systems to foster innovation. However, the lack of technical support and a mismatch between IT systems and the requirements of new initiatives serve as significant barriers. When technical support is inadequate or existing IT infrastructure fails to meet the needs of innovative projects, it can lead to failures and prevent the successful adoption of new technologies (see Ndebele and Enaifoghe 2024; Schmidt 2023). The figure underscores the complex interplay between individual attitudes, organisational culture, and technological capabilities to facilitate or obstruct public innovation.

Transformation in the public sphere

The public sector has numerous roles and functions, including building and maintaining trust in government, drafting rules and laws, ensuring social security, creating favourable institutional frameworks, providing quality services, and responding to “the needs of citizens and businesses” (European Commission 2013, p. 6). Innovation plays a crucial role in development and is fundamental to achieving competitive advantage. It serves as a key differentiator for firms, countries, and regions. Public service innovation is, therefore, vital, as it can foster greater government effectiveness and create a conducive environment for business innovation. Furthermore, it can lead to shaping national innovation policies that support business innovation and enhance innovation through public procurement requirements (European Commission 2013).

The literature indicates that while new technologies increasingly transform society, especially in the past decade, researchers and governments have fully recognised the need to digitalise key public services. However, alongside governmental efforts there is a need for societal involvement in designing and using these services to fully benefit from the advantages of digital government (Choi 2016). Policy making supported by machine learning can simulate and identify the most effective approaches, leading to improved policies through self-correction. It can also facilitate digital platforms for crowdsourced and distributed policy making, enabling citizens to contribute their expertise and experience. The digital transformation of public administration and services points towards changing societal values

and needs, which are driven by technological forces and are already manifesting in various ways within certain societal groups (Choi 2016).

Policy recommendations suggest a focus on increasing government effectiveness and regulatory quality. This focus involves promoting organisational product and process innovation, supporting programmes encouraging collaboration and network development, and establishing mechanisms to reduce uncertainty and perceived risks in innovation. Policies should also promote education and competency development to foster positive attitudes and the capacity to create more innovative initiatives (Choi 2016).

Knowledge barriers

Barriers to knowledge sharing have been identified in various contexts (Damodaran and Olphert 2000; Fullwood et al. 2013; Kukko 2013; Paroutis and Al Saleh 2009; Ranjbarfard et al. 2014), including project-based organisations (Wiewiora et al. 2009). However, research on ICT and project environment barriers is limited. Recent studies have examined knowledge sharing risks in agile software development teams (Ghobadi 2015).

A high reliance on in-house services and process innovation highlights the need to develop innovation capabilities within the public sector. Outsourcing innovation processes may be inefficient in promoting public sector innovation, since such practices cannot be easily adapted to continuous processes. There is a clear need to maximise resources and external knowledge to foster higher levels of innovation and accelerate innovation processes in the public sector (Ghobadi 2015).

The literature identifies poor technological knowledge (Attewell 1992) and resistance to technology adoption (Ardichvili, 2008) as key knowledge-sharing barriers. Riege (2005, p. 29) notes that a “lack of technical support (internal or external) and immediate maintenance of integrated IT systems obstructs work routines and communication flows”. Public sector innovation can improve government agencies' efficiency, effectiveness, performance, and legitimacy. The digital transformation of government involves further modernisation of public administration, seamless cross-border mobility, and enhanced digital interactions. Developing techniques to boost public sector innovation is crucial for prioritising service delivery and can serve as a catalyst to overcome barriers to public innovation. Machine learning can simulate and identify the most effective approaches, leading to improved policies through self-correction. It can also facilitate digital platforms for crowdsourced and distributed policy making, enabling citizens to contribute their expertise and experience. The digital

transformation of public administration and services points towards changing societal values and needs, which are driven by technological forces and are already manifesting in various ways within certain societal groups (Portion et al. 2023; Choi 2016).

De Vries, **Bekkers and Tummers** (2015) identify several types of innovation in the public sector: (i) process innovation, focusing on either the technological or administrative core of an organisation, (ii) product or service innovation, (iii) governance innovation, and (iv) conceptual and communication innovation. Innovation capacity is thus linked to innovation drivers and barriers, including structures, processes, contextual factors, external networking, and leadership quality (Lewis et al. 2018). Torfing, **Peters, Pierre and Sørensen** (2019) argue that institutional design, public leadership, and systematic change can either stimulate or impede innovation processes. In contrast, Timeus and Gascó (2018) suggest that a popular method to improve innovation capacity in the public sector involves higher-level governments creating innovation labs within the city government's organisational structure.

Digital technology for employment independence

Thusi et al. (2023) argue that digital technologies' development and accelerated deployment are crucial due to their impact on structural changes in the economy, new industries and businesses, and the advancement of technologically sophisticated ICT production and services. Accelerating digital innovations is essential, particularly in South Africa's high unemployment rate, where many citizens depend on government services. Digital technology can significantly enhance communication and service delivery, addressing the government's inability to reach every citizen efficiently and effectively. South Africa experiences the highest level of inequality and a significant gap between the rich and the poor, making efficient service provision vital for bridging this gap (Thusi et al. 2023).

A lifecycle approach to regulating technologies should be considered. Enhancing public digital literacy across all age groups, including young citizens, is vital. The government must develop strategies to promote innovation in the public sector, prioritising service delivery to address the many challenges faced by the South African public sector (Thusi et al. 2023).

Digital innovation for overcoming barriers

Bloch and Bugge (2013) examine how public sector innovation can be captured and the extent to which its measurement can be based on frameworks developed initially for the private sector. They present a theoretical framework and indicators for measuring innovation in the public

sector. Djellal, Gallouj and Larouche (2013) highlight the specificities of services and their impact on innovation, examining the nature of public services perceived as non-market and non-competitive, influencing inherent innovation processes. They conclude by emphasising the principles of public service that impact innovation, such as equality, fairness, and continuity (Bloch and Bugge 2013).

Given governments' increasing adoption of digital tools globally, community learning centres should offer courses to build knowledge on digital technology and its direct and indirect impacts, including ethics and human rights. Schools of public administration and government training institutes are well positioned to support continuous digital learning. The demand for innovation in public sectors worldwide arises from challenges such as an ageing populations, rising debt, and the need for improved, cost-effective services. Scholars widely believe that innovation can enhance the quality of public services and the problem-solving capabilities of governmental organisations in addressing social challenges. Politicians, business leaders, social organisations, and individuals increasingly prioritise innovation in the public sector to solve social problems (Bloch and Bugge 2013).

Sirait et al. (2023) avows that South Africa has implemented various innovative approaches to improve service delivery. However, these efforts are not integrated into the broader public sector or its efforts to enhance service delivery innovation. The acceptance of public innovation is often derailed by a lack of political will and flawed bureaucratic systems that govern many public sectors. Political interference is cited as a contributing factor to delays in decision-making. Implementation success is further compromised by nepotism and cadre deployment, resulting in unskilled individuals occupying specialised and high-paying roles. This issue is particularly prevalent in lower spheres of government, such as local municipalities and metropolitan areas.

Studies by Cinar, Akkoyunlu and Ergun (2019) and Smith and Sandberg (2018) confirm that barriers affect innovation processes. They identify corruption as the most significant barrier, which undermines administrative processes and stakeholder collaboration, crucial for defining the scope of innovation. The democratic dispensation initially aimed to foster public-private stakeholder collaborations to learn from best practices. However, corruption has discouraged active private sector engagement in the public sector. Nzimakwe (2015) contends that overcoming these barriers depends on national digital strategies and end-to-end technologies

that embrace holistic and integrated approaches, focusing on tangible results, closing digital divides, and enhancing the lives and well-being of South African citizens.

These innovations should be fit for purpose, balancing opportunities and risks while promoting a people-centric approach and respect for human rights. The success of public innovations largely depends on intentional consultations and engagement with the public to understand their needs regarding digital public service delivery. Enhancing data-related skills among data providers and users is essential. These skills include general digital literacy and specific knowledge about data formats and standards, appropriate licences, data protection requirements, and tools for analysis and visualisation. A shared understanding of the value of open data, combined with relevant skills, is a winning combination that can trigger further changes and remove obstacles. Similar awareness and skills are also needed for co-creation, helping to address the dormant culture that leads to inefficient attitudes and practices in the public sector.

Toots, McBride, Kalvet and Krimmer (2017) argue that, aside from street-level bureaucrats' ineffective attitudes and practices, the availability of relevant, high-quality, and easily usable open data is the primary hurdle that must be addressed to enable data-driven service creation. Guidelines are often inaccessible. Furthermore, while South African policies are well-crafted on paper, they are not easy to implement. Implementation is also hindered by the non-allocation of resources, including specialists and a costed budget. Public policies supporting public innovations should be promulgated as a corrective measure with increased awareness of open data and its benefits. Suppose the value and potential uses of open data are poorly understood: this creates a vicious cycle where governments delay the release of credible data and citizens do not demand it or hold the government accountable.

In the new South African democratic dispensation, awareness and skills are also needed to realise public innovation objectives. The current culture, attitudes, and practices in public sector organisations do not necessarily support the engagement of citizens, businesses, and other stakeholders in creating public services. Any change in the service creation process requires all stakeholders to see clear value in co-creation and to possess the necessary skills for engagement, participation, and collaborative service design. Sceptical or hostile attitudes can easily give way to distrust.

Data-driven co-creation is only possible when a certain level of trust exists between stakeholders and public administrators and is governed by ethical conduct. Ethical conduct

leads to sound decision-making and service co-creation. Access to validated data becomes a shared resource, maximising the active involvement of key stakeholders and fostering mutual relations between the public and private sectors. Good relations also create safe spaces between sectors for horizontal and vertical engagements, limiting confounding barriers. All sectors benefit from creating new, sustainable business models that citizens own (Popa 2018).

Theoretical framework

TOADS framework

The study was guided by the technology, organisation, actors, institutions, and systems (TOADS) framework developed by Charles Benda and Nutt (2016, p. 432). In the TOADS framework technology includes tools and infrastructure, organisation refers to structure and culture, actors incorporate stakeholders and leadership, and institutions encompass policy and regulations. Benda and Nutt (2016) opine that the framework explains how public organisations adapt to changing environments. Considering the interactions between the framework's components provides an understanding of the complex factors that shape the public sector. The study used the framework to determine how its components interact and influence public sector innovation.

Multi-level perspective theory

The multi-level perspective (MLP) theory, proposed by Frank Geels (2002), was employed to analyse innovation as a transformative process, encompassing the complex interactions between organisational, institutional, and contextual factors. The MLP theory is especially useful in examining how changes occur within socio-technical systems by distinguishing three levels: niche, regime, and landscape. The niche level represents small-scale innovations, such as emerging technologies or novel practices that have the potential to disrupt the status quo. The regime level consists of established practices, rules, policies, and cultural norms that dominate a particular sector. The landscape level includes broader societal influences like cultural values, political trends, and economic forces that shape and constrain both niche and regime dynamics.

The study applied the MLP theory to understand how these three levels interact and co-evolve, influencing the adoption and implementation of innovations in the public sector. For instance, the study investigated how niche innovations, such as digital tools and practices, interact with the existing regime of public administration, which is often characterised by established

bureaucratic structures and traditional service delivery methods. At the landscape level, the study examined how broader societal factors, such as public demand for transparency and efficiency, affect the development of niche innovations and the regime's stability.

The theory was used to identify the enablers and barriers of public innovation in this multi-layered context. By considering how niche innovations might challenge or integrate into the existing regime and how the landscape might support or resist these changes, the study endeavoured to provide an understanding of the factors that facilitate or hinder the transformation of public services. In addition, this approach helped to explore the conditions under which niche innovations can scale up and effect change at the regime level, contributing to insights into how public sector innovation can be driven or impeded by interactions across different levels.

Method

Research design and sampling

The study employed a qualitative research design, utilising in-depth interviews to gain comprehensive insights into the phenomenon of digital transformation within the public sector. A purposive sampling method selected ten participants, comprising IT workers, municipal managers, and citizens from the local government sector. Islam and Aldaihani (2022) and Creswell (2012) assert that qualitative studies are typically conducted with small samples to provide in-depth insights into specific phenomena, even though the findings cannot be generalised to the broader population.

Data collection

Qualitative in-depth interviews were conducted using open-ended questions to explore both the benefits and challenges of digital transformation. This approach was selected to capture the participants' perspectives in a rich and detailed manner, allowing for a more nuanced understanding of the factors influencing digital transformation. The interview process delved deeply into the participants' experiences, focusing on how digital transformation affects service delivery and the potential for organisational learning and adaptation within the public sector.

Data analysis

The qualitative data gathered from the interviews were subjected to thematic analysis. This involved systematically identifying themes in the responses to uncover insights into the factors that enable or hinder digital transformation in the context of public sector innovation. The thematic analysis provided a structured framework for interpreting the data, offering a nuanced view of the organisational and societal factors impacting digital transformation.

Credibility and ethical considerations

The credibility of the data was vetted by the participants recruited for the study, ensuring that the findings accurately reflected their perspectives and experiences. To maintain the integrity of the research, all ethical considerations were rigorously observed. These considerations included obtaining informed consent from all participants, ensuring confidentiality, and safeguarding their well-being throughout the research process. These ethical protocols are critical when conducting human research, especially in studies that profoundly probe participants' experiences and perspectives.

Findings

The study's findings are discussed under two main themes: enablers and barriers to public innovation. These findings answer the aim of the research to explore the enablers and barriers to public innovation in the local government sector in KwaZulu-Natal, South Africa. Furthermore, the findings address the research objectives by identifying enablers and barriers to public innovation and evaluating their impact on service delivery.

The enablers support the development and implementation of new ideas and technologies, ultimately leading to enhanced governance, citizen engagement, and improved service delivery. The barriers hinder the progress of public innovation in the municipality. The enablers' positive impact includes fostering transparency, efficiency, and citizen engagement. Conversely, the negative impact of the barriers generally points to ineffective policy implementation, communication breakdowns, and stagnation of innovation initiatives.

This section links the findings to the literature, providing a context for understanding how the observed enablers and barriers fit within existing knowledge on public sector innovation.

Enablers of public innovation

Enablers of public innovation support and facilitate the development and implementation of new ideas, products, services, or processes in the public sector. These enablers significantly improve the local government municipalities as an essential tourism attraction and economic hub of KwaZulu-Natal.

Endorsement of public innovation policies

The KwaZulu-Natal Municipalities Council's endorsement of public innovation policies was recognised as a key enabler in the study. By aligning with Section 151 of the Constitution (Republic of South Africa 1996), which empowers local governments to manage their affairs effectively, these policies create a foundation for public innovation. According to Mhlanga et al. (2021), adopting digital technologies in governance frameworks is crucial for bridging digital divides and promoting citizen engagement. This endorsement lays the groundwork for an environment where innovation can flourish, fostering an atmosphere of adaptability and proactive problem solving.

Launch of the data nerve centre

The establishment of a data nerve centre was found to be an enabler of public innovation, serving as a committed governance structure. As a repository of valuable data and an information hub, the nerve centre guides service delivery decisions, influencing the acceleration of services and enabling stakeholder engagement. Syukur and Muin (2023, p. 34) describe technological infrastructures as the "new normal" in rendering public services. They argue that coordinated data management systems are essential for ensuring transparency, enhancing decision-making, and facilitating cross-sector collaboration. By centralising information, the nerve centre provides an accurate status of the municipality, fostering informed and responsive governance.

Approval of the mobile app

As an extension of the data nerve centre, the approval of a municipal mobile app serves as a community resource, allowing residents to interact with the municipality without waiting in long queues for service delivery. This technological innovation brings the municipality closer to the people, aligning with the ideas of Lam and Li (2018), who emphasise the importance of citizen participation in service delivery through digital platforms. By offering a user-friendly

interface for accessing municipal services, the app helps bridge the gap between the municipality and its citizens, promoting inclusivity and efficiency.

Conceptualisation of tools and resources

The conceptualisation and implementation of public innovation tools and resources reframed the efficacy of local government spheres in KwaZulu-Natal. This reframing enhanced efficiency, accountability, transparency, decision-making, adaptability, and sustained service delivery. According to Wegrich (2019), such an integrated approach to innovation fosters public value creation, citizen involvement in decision-making, and the development of new skills and capabilities. The municipality can address complex societal issues and improve governance by leveraging technology and innovation.

Barriers to public innovation

Despite the presence of enablers, the study also uncovered significant barriers that hindered the effective implementation of public innovation in local municipalities.

Failure to implement policy objectives

The policy objectives for public innovation have not materialised due to a lack of clear explanation and understanding among implementers. This gap has led to ineffective implementation, echoing the concerns of Bloice and Burnett (2016), who argue that communication barriers often prevent the realisation of public policies. In the case of local government spheres in KwaZulu-Natal, the failure to articulate and disseminate policy objectives resulted in missed opportunities for innovation and progress.

Absence of good governance

A lack of effective governance has hindered stakeholder engagement, as political actors have not taken full ownership of the policy. The endorsement process for public innovation policies has been reduced to a tick-box exercise, with no specific committee taking accountability for policy implementation. Mueller (2015) highlights that the absence of a transparent organisational culture and governance framework distorts policy intentions, leading to fragmented efforts and a lack of accountability. The local spheres of government municipality's experiences mirror these findings, as the absence of good governance has created a significant barrier to innovation.

Poor reception by internal staff

Internal staff, who are supposed to implement the policies, receive them poorly, hindering their success. The reluctance of internal stakeholders to embrace innovation aligns with the observations of Ardichvili (2008), who notes that resistance to technology adoption is a key barrier to public sector innovation. Without buy-in from the staff responsible for implementation, innovative initiatives are unlikely to achieve their intended outcomes.

Silo mentality

Silo mentality is a mindset in an organisation where different departments or groups are reluctant to share information, resources or collaborate with others outside their immediate team. This mindset can lead to a lack of coordination, inefficient communication, and a fragmented approach to problem solving. In the context of local government municipalities, the silo mentality has impeded horizontal (between departments) and vertical (across hierarchical levels) communication.

As Riege (2005) describes, this mentality is a barrier to knowledge sharing and collaboration. The result is inadequate data management and isolated decision-making, hindering the development of integrated and cohesive solutions for public innovation. This mentality has directly impacted service delivery by preventing the municipality from operating as a unified entity and stalling efforts to improve public services.

Unserviced tools and resources

The tools and resources designated for public innovation have been neglected and have failed due to budget cuts. Once a critical resource, the data nerve centre became obsolete without proper servicing and updates. Ismail, Ghani and Hamid (2009) emphasise that poor IT infrastructure maintenance seriously disrupts public innovation. The neglect of these tools undermined the municipality's capacity to support ongoing innovation and sustain the benefits of previous investments.

External challenges

The municipality also faces external barriers, such as inclement weather and chronic floods, compromising the tools and resources to expedite public innovation. However, the risk directorate has failed to identify these factors as internal threats that require resolution. External challenges disrupt the municipality's ability to provide consistent public services. These events

can damage essential infrastructure, interrupting tools like the data nerve centre and the mobile app that are vital for efficient service delivery.

The risk directorate's failure to identify and mitigate these threats exacerbates the situation, resulting in delays in services such as emergency response and public safety measures. This failure underlines the need for a resilient approach to service delivery that includes proactive risk management, as highlighted by Thusi et al. (2023). Public innovation efforts are undermined without addressing these external factors, reducing citizens' reliability and quality of services.

Table 1 presents a summary of the findings on public innovations.

Table 1: Findings – enablers, barriers, and their impact on service delivery

Variable Details Impact on Service Delivery
Enablers
– Technological infrastructure enhances efficiency, accountability, transparency, and decision-making
– Public innovation policies promote responsive governance
– Data nerve centre and mobile app improve service delivery and citizen engagement
– Improve responsiveness and streamlined processes
– Increase citizen engagement and satisfaction
– Enhance decision-making and service efficiency
Barriers
– Flawed bureaucratic systems slow implementation and service delivery
– Poor policy implementation leads to missed opportunities
– Silo mentality impedes communication and coordination
– External challenges, such as inclement weather, affect infrastructure and digital tools
– Lead to implementation gaps, inefficiencies, and service delivery delays
– Reduce effectiveness and responsiveness in service provision
– Disrupt communication and infrastructure, impacting service quality

Recommendations

Based on the findings concerning enablers of and barriers to public innovation and their impact on service delivery, the study proposed recommendations for public innovation for public innovation in KwaZulu-Natal. These recommendations might ensure implementation and collaboration among government agencies, private stakeholders, and the public.

Enhancing public services through innovation

To improve public innovation, the municipality should create more responsive services that directly address citizens' needs. By adopting innovative approaches, the government can enhance efficiency and effectiveness, increase satisfaction among service users, and build a more trustworthy and effective public sector.

Fostering collaborative problem solving

Improving public innovation requires collaboration across various sectors, including government, private stakeholders, and citizens. Establishing clear communication channels and promoting cross-sector partnerships will enable more agile responses to societal issues, allowing the municipality to tackle challenges promptly and effectively.

Promoting good governance

The local spheres of government in KwaZulu-Natal must ensure transparency and accountability in its processes to drive public innovation. By fostering an open environment, the government can build trust with citizens, which is crucial for implementing innovative practices that align with democratic values and enhance public service delivery.

Developing strong leadership and strategic vision

Public innovation relies on strong leadership and a clear strategic vision. Leaders should actively engage stakeholders and set a direction that prioritises innovation within local spheres of government. This approach will help align innovation efforts with the municipality's goals and facilitate stakeholder involvement in the innovation process.

Cultivating a supportive organisational culture

A supportive organisational culture that encourages creativity and risk-taking is essential for public innovation. By fostering an environment where experimentation is valued, the local

spheres of government can develop innovative solutions that address public needs more effectively. These solutions include promoting openness to change and embracing new ideas.

Securing adequate resources and sustainable funding

Public innovation efforts require sufficient resources and sustainable funding. The local spheres of government should prioritise maintaining and improving tools and resources while securing long-term funding for ongoing initiatives. This approach ensures that innovative projects are not hindered by resource constraints, enabling continuous improvement in public services.

Strengthening collaboration and partnerships

Collaboration with public and private stakeholders is crucial for advancing innovative practices and improving service delivery. Building mutual trust and cooperation involves fostering partnerships that leverage diverse expertise and resources to support innovation.

Streamlining policies and regulatory frameworks

Public innovation requires a supportive policy and regulatory environment. The local spheres of government should streamline policies and regulations to remove unnecessary barriers to innovation. By ensuring policies are flexible and conducive to innovation, the local government can create an environment that encourages developing and implementing new ideas and practices.

Reducing bureaucratic hurdles

Bureaucratic procedures can stifle innovation by slowing down decision-making processes. Local government should reduce excessive bureaucracy to foster a more innovation-friendly environment. Simplifying processes and accelerating decision-making can facilitate the implementation of innovative solutions more effectively.

Encouraging risk-taking and innovation

Risk aversion can hinder innovation efforts. Local government should create a culture that encourages risk-taking and supports new initiatives. By promoting an innovative mindset, this could yield progress and transformation, leading to more effective public service delivery.

Allocating resources effectively

To enhance public innovation, local government must ensure adequate resources are allocated to support innovation efforts. This allocation includes investing in new technologies and infrastructure that enable more effective public services, empowering the local government to pursue ambitious and impactful initiatives.

Overcoming resistance to change

Addressing organisational inertia is essential for fostering public innovation. Local government should encourage change and be open to new methods and practices. The local government can also drive transformative change within the public sector by cultivating a culture that embraces innovation.

Modernising policy and regulatory barriers

Public innovation requires an adaptable policy environment. Local government should review and modernise existing policies and regulations to ensure they support, rather than hinder, innovative efforts. By fostering a more flexible regulatory environment, the government can facilitate the adoption of new practices and technologies.

Promoting a culture of innovation

To drive public innovation, local government should recognise and reward creativity and risk-taking within the organisation. By promoting a culture that values innovation, local government can inspire a forward-thinking approach to addressing public sector challenges, ultimately improving service delivery.

Investing in capacity building and skills development

Capacity building is crucial for sustaining public innovation. Local government should invest in training and development opportunities to build innovation management and problem-solving skills. By developing human capital local government can ensure the long-term success and expansion of its innovation efforts.

Ensuring sustainable funding and partnerships

Securing sustainable funding is key to supporting long-term innovation initiatives. Local government should explore alternative funding models, such as public-private partnerships, to ensure innovative projects have the necessary financial backing. This approach will facilitate the continuous improvement and sustainability of public innovations.

Table 2 presents strategies to foster public innovation.

Table 2: Strategies to foster public innovation

Strategies	Details
Promotion of an innovation culture	Encourages creativity and risk-taking
	Recognises and rewards innovative efforts
Investing in capacity building	Provides training and development in innovation management
	Enhances problem-solving skills
Enhancing collaboration and networking	Builds partnerships across sectors
	Facilitates knowledge sharing and cooperation
Streamlining processes	Simplifies procedures and regulations
	Accelerates decision-making processes
Securing sustainable funding	Allocates resources for innovations
	Explores public-private partnerships for funding

Table 3 presents the expected benefits of following the recommended strategies for public innovation.

Table 3: Expected benefits of public innovation strategies

Benefits	Details
Improved public services	Responsiveness to citizens' needs
	Efficiency and effectiveness in service delivery

Benefits	Details
	Satisfaction among service users
	Promotes cross-sector collaboration
Enhanced problem solving	Establishes clear communication streams
	Enables agile governmental responses
	Increases transparency and accountability
Good governance	Improves trust between government and citizens

Conclusion

This paper described a study on the enablers of and barriers to public innovation in local spheres of government in South Africa, focusing on digital transformation and service delivery. The study explored the municipality's challenges and opportunities in adopting innovative practices and identified factors influencing public innovation. The study employed the MLP theory and the TOADS framework to understand the complexities of public sector innovation.

The study identified several enablers and barriers through qualitative, in-depth interviews with senior city officials and community members. Technological infrastructure, the endorsement of public innovation policies, the launch of a data nerve centre, and the approval of a municipal mobile app were found to be enablers. These elements enhanced efficiency, accountability, transparency, decision-making, and sustained service delivery, fostering an adaptable and responsive governance structure. The literature aligns with these findings, suggesting that technological advancements, policy support, and digital tools enhance public sector efficiency and foster transparent, accountable governance.

Conversely, barriers such as flawed bureaucratic systems, poor policy implementation, silo mentality, and external challenges like inclement weather were identified. These barriers negatively impacted service delivery, undermining local government ability to fulfil its constitutional responsibilities effectively. The findings aligned with existing literature, which indicates that challenges such as poor technological knowledge, resistance to change, and lack of good governance can hinder public innovation.

The study emphasised that technology offers significant opportunities for the public sector to enhance interactions between governments and citizens, contributing to open governance and increased public trust. It further accentuated the importance of harnessing technology and innovation to advance and respond to public development and service delivery sustainability. The research underscored the importance of public-private sector collaboration and good governance to champion technological advances and strengthen democratic principles. Furthermore, the study highlighted the necessity of fostering a culture of experimentation, providing funding, and ensuring flexible regulatory frameworks to accommodate new approaches.

To improve public innovation in the local government sector the study recommended enhancing public services through, for example, innovation, fostering collaborative problem solving, promoting good governance, developing strong leadership, and cultivating a supportive organisational culture. By addressing these recommendations, the local government sector could meet the complex challenges of modern governance, ensuring improved creativity and readiness for advanced technologies such as the Fourth and Fifth Industrial Revolutions (4IR and 5IR)

The 4IR is characterised by the fusion of technologies like AI (machine learning and decision-making), the Internet of Things (IoT) (interconnected devices and sensors), and big data (large-scale data analysis), which can significantly enhance public service delivery through more efficient and data-driven decision-making.

The 5IR focuses on the harmonious integration of human-centric technology, emphasising collaboration between humans and machines. By adopting and integrating these advanced technological paradigms, municipalities can strengthen their public innovation efforts, enabling them to address complex societal challenges and improve the quality of life for citizens.

Public innovation is crucial for delivering effective and efficient services that meet citizens' needs and strengthen democracy, human rights, and socio-economic well-being. By addressing the barriers and leveraging the enablers, municipalities could create a responsive and innovative governance structure.

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