



International Journal of Development and Sustainability

ISSN: 2186-8662 – www.isdsnet.com/ijds

Volume 13 Number 5 (2024): Pages 346-366

ISDS Article ID: IJDS2404150



Evaluating the impact of digital governance in improving service delivery in Eastern Cape Municipalities

Beauty Zindi *

School of Public Management Governance & Public Policy, University of Johannesburg, Republic of South Africa

Abstract

This article investigates the impact of digital governance on service delivery within Eastern Cape municipalities. With the increasing integration of digital technologies in governance structures worldwide, understanding its effects on service delivery is crucial. The Eastern Cape province in South Africa presents a unique context characterized by socio-economic challenges and diverse governance dynamics. Through a document analysis, this research evaluates the implementation of digital governance initiatives and their influence on service delivery outcomes. Key areas of focus include transparency, citizen engagement, efficiency, and the use of digital platforms for service provision. Findings reveal both opportunities and challenges associated with digital governance adoption, highlighting the importance of context-specific strategies and stakeholder engagement. The article contributes to the growing literature on digital governance by offering insights into its practical implications for improving service delivery in the Eastern Cape municipalities and informing policy and practice in similar contexts globally.

Keywords: Municipalities; Digital Governance; Technology; Digitalization; Service Delivery

Published by ISDS LLC, Japan | Copyright © 2024 by the Author(s) | This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Cite this article as: Zindi, B. (2024), "Evaluating the impact of digital governance in improving service delivery in Eastern Cape Municipalities", *International Journal of Development and Sustainability*, Vol. 13 No. 5, pp. 346-366.

* Corresponding author. *E-mail address:* letwinbee@gmail.com

1. Introduction

In recent years, the landscape of governance has undergone a profound transformation with the advent and proliferation of digital technologies. The Eastern Cape, a province of South Africa, is no exception to this global trend. As municipalities across the region grapple with the challenge of enhancing service delivery to meet the diverse needs of their citizens, digital governance emerges as a promising avenue for innovation and improvement (Nokele and Mukonza, 2021). In the quest for efficient governance and improved service delivery, municipalities worldwide are increasingly turning to digital solutions. Recognizing the need for innovative solutions, Eastern Cape municipalities have embraced digital governance initiatives. These initiatives use a range of strategies and technologies to improve service delivery, citizen engagement and administrative processes. Municipalities are utilizing digital technologies, such as e-governance systems, data analytics tools and mobile applications to surmount conventional obstacles to efficient governance (Udovita, 2020:9). The Eastern Cape province, known for its diversified population and geographical challenges, has been actively investigating how digital governance might be used to solve issues with service delivery.

Digital governance, encompassing the use of information and communication technologies (ICTs) to facilitate and optimize governance processes, represents a paradigm shift in the way governments interact with their constituents and manage public resources (Ngcamu, 2019). From online platforms for service delivery to data-driven decision-making frameworks, digital governance holds the potential to streamline operations, increase transparency, and foster greater accountability within municipal administrations. In the Eastern Cape, where socio-economic disparities and infrastructural challenges present formidable obstacles to effective governance, harnessing the power of digital technologies becomes imperative for driving meaningful change and advancing the well-being of communities.

2. Historical developments of digital governance in the South African municipalities

The historical development of digital governance in South African municipalities has been shaped by various factors, including advancements in technology, changes in governance structures and evolving citizen expectations (Malomane, 2021). In the late 1990s and early 2000s, some South African municipalities began adopting information systems to streamline administrative processes and improve service delivery. Basic applications, such as financial management systems and database software, were implemented to digitize manual tasks. For instance, the City of Johannesburg implemented an electronic procurement system in the early 2000s to automate purchasing processes and enhance transparency in procurement transactions (Ngcamu, 2019).

With the advent of the internet and e-government frameworks in the early 2000s, South African municipalities started launching online platforms to provide citizens with access to government services and information (Apleni and Smuts, 2020; Kashaija, 2022). These initiatives aimed to increase transparency, efficiency, and citizen participation in governance processes. The eThekweni Municipality launched its eThekweni Online platform, offering a range of services such as payment of rates and taxes, submission of service requests, and access to municipal documents and reports (Jakoet-Salie, 2020).

In addition, the South African municipalities began integrating Geographical Information Systems (GIS) technology into their operations to improve spatial planning, infrastructure management, and service delivery.

The GIS systems allowed municipalities to map and analyze geographic data, enabling more informed decision-making. The City of Cape Town implemented a GIS-based asset management system to track and maintain infrastructure assets such as roads, water pipes, and public facilities (Ali and Anwar, 2021). With the proliferation of mobile devices and increased internet penetration, South African municipalities expanded their digital service delivery offerings to include mobile applications and SMS-based services. These initiatives aimed to make government services more accessible and responsive to citizens' needs. Mensah et al. (2022) confirm that the Tshwane Municipality launched the Tshwane Mobile App, allowing residents to report service faults, pay bills, and access information about municipal services directly from their smartphones.

South African municipalities have increasingly embraced open data and civic technology initiatives to promote transparency, accountability, and citizen engagement. Open data portals have been launched to provide access to government datasets, while civic tech platforms facilitate collaboration between government and civil society. Ngcamu (2019) noted that the Code for South Africa partnered with the City of Cape Town to develop the Open Data Portal, which provides access to a wide range of municipal datasets for analysis and used by developers, researchers, and citizens.

In recent years, South African municipalities have explored smart city concepts and Internet of Things (IoT) technologies to improve urban management and service delivery. Smart initiatives include the deployment of sensor networks for traffic management, waste monitoring, and environmental monitoring. The eThekweni Municipality launched the Durban Operations Centre, which integrates data from various sources, including CCTV cameras, weather sensors, and traffic signals, to monitor and respond to city-wide events and emergencies in real-time (Nokele and Mukonza, 2021).

With the advent of technology, Eastern Cape municipalities began adopting basic information systems to streamline administrative processes and improve service delivery. These systems often focused on functions such as financial management, human resources, and asset tracking. The Nelson Mandela Bay Metropolitan Municipality implemented an electronic billing system in the early 2000s to streamline the processing of utility bills and improve revenue collection processes (Udovita, 2020).

As internet usage increased in the early 2000s, Eastern Cape municipalities started launching e-government initiatives to provide online access to government services and information. These initiatives aimed to enhance transparency, efficiency, and citizen engagement. The Buffalo City Metropolitan Municipality launched the "My Municipality" portal, allowing residents to access various municipal services, make payments, and submit service requests online (Shava, 2022). As times goes by, Eastern Cape municipalities began integrating GIS technology into their operations to improve spatial planning, infrastructure management, and decision-making. GIS systems enabled municipalities to map and analyze geographic data for better service delivery. According to Nel and Masilela (2020) the Chris Hani District Municipality implemented a GIS-based land information system to manage land parcels, zoning regulations, and property ownership information more effectively.

With the rise of mobile technology, Eastern Cape municipalities expanded their digital service delivery offerings to include mobile applications and SMS-based services. These initiatives aimed to make government services more accessible and responsive to citizens' needs. The OR Tambo District Municipality launched a mobile app for reporting service faults, accessing municipal information, and receiving alerts about community events and initiatives (Nokele and Mukonza, 2021).

Eastern Cape municipalities have increasingly embraced open data and civic tech initiatives to promote transparency, accountability, and citizen engagement. Open data portals and civic tech platforms have been established to facilitate collaboration between government and civil society. The Alfred Nzo District Municipality partnered with local NGOs to develop a civic tech platform that enables residents to monitor service delivery, report grievances, and engage with municipal officials on community development projects (Mkosana, 2022).

In recent years, the Eastern Cape municipalities have explored smart city concepts and Internet of Things technologies to improve urban management and service delivery. Smart initiatives include the deployment of sensor networks for traffic management, waste monitoring, and environmental monitoring. The Nelson Mandela Bay Metropolitan Municipality implemented a smart parking system in collaboration with private partners, using IoT sensors to optimize parking availability and reduce traffic congestion in the city center (Vyas-Doorgapersad, 2022).

Although municipalities in the Eastern Cape are increasingly adopting digital governance, evaluation of the efficacy and impact of these initiatives on service delivery results is still necessary. Though digital technologies can simplify procedures and increase transparency, there are obstacles to their adoption, including insufficient funding, lack of digital knowledge and infrastructure limitations (Mkosana, 2022). Furthermore, it is still unclear and needs further research to determine whether digital governance initiatives translate into tangible improvements in service delivery remains to be fully understood and evaluated. The article aims to achieve the following objectives:

- Assess the extent of digital governance adoption across Eastern Cape municipalities, including the types of technologies and initiatives implemented.
- Identify the key challenges and barriers faced by municipalities in implementing digital governance initiatives in Eastern Cape municipalities.

3. Theoretical and empirical perspectives on digital governance

3.1. Digital governance theory

The article is informed by the digital governance theory. Digital Governance theory emphasizes the use of digital technologies such as e-governance platforms, mobile applications, and data analytics tools to improve administrative efficiency, transparency, and citizen engagement (Marche and McNiven, 2003). This theory can be used to comprehend how digital solutions are being used in Eastern Cape municipalities to improve citizen participation in governance, boost transparency in decision-making, and streamline administrative operations. Fraga (2002) noted that municipalities may drastically cut down on processing times and bureaucratic delays by digitizing documents, automating repetitive processes and putting in place electronic workflows. To speed up service delivery procedures and make it simpler for citizens and business to access municipal services, digital platforms might be implemented for online permit applications or electronic billing systems.

Faloyi and Ajoyi (2021) emphasizes that digital governance theory promotes transparency and accountability by providing greater visibility into government operations and decision-making processes. Municipalities can provide easy public access to budget, spending, and project update information by utilizing online portals and dashboards. In the end, improved service delivery results from this transparency between

citizens and government institutions. Eastern Cape municipalities can introduce open data programmes that give citizens access to and analysis of public data, enabling them to keep track on the effectiveness of service delivery and hold public servants responsible for their actions.

The digital governance theory facilitates greater citizen engagement and participation in governance processes. Municipalities can ask people for feedback, include them in decision-making, and work with them to co-create solutions to local problems by using online platforms, social media channels, and mobile applications (Collins, 2009). Municipalities in the Eastern Cape can crowdsource ideas for better service delivery, hold virtual town hall meetings, and get feedback on projects by using digital platforms.

More significantly, digital governance theory makes data-driven decision-making possible by gathering, evaluating, and using data to guide the formulation of policies and strategies for providing service delivery. According to Anttiroiko (2007), municipalities may more efficiently allocate resources, recognize trends, and anticipate service requests by utilizing data analytics tools and predictive modeling approaches. This theory is relevant to the article because it enables municipalities in the Eastern Cape to prioritize investments in areas with the highest need and improve service delivery outcomes by analyzing data on population demographics, infrastructure usage, and service requests.

The theory promotes inclusivity and accessibility by ensuring that municipal services are available to all residents, including those in remote or underserved areas. Grigalashvili (2022) posits that municipalities can provide equitable access to government information and services by overcoming geographical barriers through the provision of internet services and mobile applications. In line with this study, municipalities in the Eastern Cape may create mobile applications that let locals, wherever they are, report problems with the infrastructure, ask for services, and get real-time updates on projects being worked on by the municipality.

3.2. Conceptualising digital governance

Digital governance involves understanding how digital technology can be used to improve service delivery, strengthen governance procedures, and encourage public engagement and participation (Grigalashvili, 2022). Digital governance involves the use of digital platforms, tools, and techniques to support collaboration, communication, and decision-making both inside government departments and between the government and the public (Shava, 2022). In the South African context, digital governance refers to the application of digital technology, data-driven methodologies and innovative strategies to enhance the effectiveness, inclusivity, and transparency of governance processes at all governmental levels (Vyas-Doorgapersad, 2022:3).

South Africa has been actively investing in e-government initiatives to provide citizens with convenient access to government services online. This includes websites like eHealth, which provides access to medical records and services, eHome Affairs, which allows users to apply for passports and IDs and eFiling, which allows users to file taxes. These programmes seek to lessen paperwork, cut down on inefficiencies in the bureaucracy and raise public satisfaction with government services. Digital technology expansion has increased data and information exchange opportunities, but it has also brought new governance concerns. Enaifoghe et al. (2023) mention that Analog governance mechanisms like contracts and relational conventions are being pushed to their limits by digital exchanges like platform-based transactions and online communities, commonly take place in huge networks with multiple simultaneous interactions.

3.3. The application of digital governance in the South African public service

Public service reforms in South Africa commenced in 1995 when the White Paper on Transformation of Public Service (WPTPS) was circulated. This document served as a foundational framework for the initiation and execution of novel policies in public service delivery. Subsequently, the Batho Pele White Paper was revealed in 1997, serving as an additional guide for the revolution of public service delivery (Kanyemba, 2017). In the aftermath of apartheid, South Africa has implemented various e-government initiatives with the aim of enhancing service delivery and rectifying historical disparities established during the previous regime. In South Africa, there has been strong support for the adoption of electronic platforms, including the internet, to facilitate the delivery of government services since the early 2000s. The country's inaugural e-government policy document, introduced in 2001, outlines a detailed framework and specific criteria established by the government for the incorporation of Information and Communication Technologies (Nokele and Mukonza, 2021). There is no doubt that developments have been achieved in the past few decades to make government services available electronically through e-government initiatives and m-government portals. Presently, every major national and provincial government department, along with most municipal governments, maintains an online presence to deliver a comprehensive range of information to the public (Murenzi and Olivier, 2017; Kanyembe, 2017). Many government department websites provide information documents such as legislative information, annual reports, speeches by government officials, media releases, green and white papers, and policy documents (Nokele and Mukonza, 2021).

Government departments like the Department of Public Service and Administration (DPSA) and the State Information Technology Agency (SITA) conducted stakeholder briefing sessions for the Gateway Project. The objective of this initiative was to provide round-the-clock government service delivery to citizens, regardless of their geographical location (Nokele and Mukonza, 2021). Apart from acquiring information from government departments, citizens have the option to access various government forms on the internet. These forms encompass applications for identity cards, passports, marriage certificates, and government employment opportunities. Some departments even facilitate online application services, simplifying the submission process for citizens and eliminating the need to visit physical offices. The Department of Labour enables citizens to register their domestic workers for the Unemployment Insurance Fund through online channels. Additionally, citizens can verify the progress of different applications online, such as checking the status of identity documents or passport applications with the Department of Home Affairs (Mbambo, 2019). In South Africa, despite the implementation of significant interventions to encourage the growth of e-government, various challenges have been encountered. One of these challenges is the linguistic and cultural diversity of the South African population and the digital divide (Hoag, 2014; Kanyemba, 2017; Nokele and Mukonza, 2021). While e-government and m-government present opportunities for governments, the capacity of South Africa being a developing country to fully harness these advantages is restricted and significantly hindered by political, social and economic obstacles (Murenzi and Olivier, 2017). As a result, in the South African context effective service delivery remains an elusive goal for many (Mkosana, 2022).

3.4. The adoption of digital governance in Eastern Cape Municipalities

The Nelson Mandela Bay Metropolitan Municipality (NMBMM), located in the Eastern Cape province, has embraced digital governance strategies to enhance service delivery and citizen engagement. Geographic Information Systems (GIS), mobile applications, and online service portals are three of NMBMM's primary

projects (Ndebele and Enaifoghe, 2023). Online service portals have been put in place by the NMBMM to give its citizens easy access to a range of municipal services. These portals act as centralized hubs for interactions between the public and the municipality that do not require in-person meetings. Nel and Masilela (2020) emphasized that residents can conduct several things via the online service portals, such as paying utility bills, requesting permits and licenses, filing complaints or service requests, and gaining access to pertinent data and documents. Municipal services are always available to the public and locations, outside of regular business hours. Shava and Vyas-Doorgapersad (2022) pointed out that online portals expedite administrative procedures, saving time and resources for both residents and municipal employees. By making information and services available online, the municipality improves accountability and openness in its operations. Through a single digital platform, the NMBMM Online Service Portal enables locals to pay property taxes, submit utility meter readings, apply for building permits, report potholes or broken streetlights, and access municipal papers and reports (Sokolow, 2020).

The NMBMM has created mobile applications in response to the increasing use of mobile devices, allowing citizens to interact with the municipality effectively and conveniently via their cellphones or tablets (Benyera, 2022). Locals can make requests, check the progress of their submissions, report problems with services, and get real-time updates from the municipality. Residents who would rather communicate with the municipality when they're on the go or from far-off places where desktop connection can be restricted might use mobile applications. Residents are guaranteed to receive timely notices and updates regarding the status of their requests or complaints. Appio et al. (2019) mention that mobile applications promote increased citizen engagement and participation in municipal affairs by offering a user-friendly and interactive platform. Using the "MyNMB" smartphone app, locals may submit images and provide location information straight from their mobile devices to report problems with service delivery, such as potholes, water leaks, or unlawful dumping (Grigalashvili, 2022).

Additionally, the Buffalo City Metropolitan Municipality (BCMM) has put in place a number of digital governance initiatives with the goals of boosting citizen involvement, streamlining resource management, and increasing service delivery. Digital payment systems, smart metering, and social media involvement are three of BCMM's primary projects. Payment systems allow citizens to make payments online or through specialized mobile applications, decreasing dependency on customary in-person transactions (Muthoni and Mkhonto, 2019). Residents can use a variety of electronic payment methods, including as credit/debit cards, online banking, or mobile wallets, to safely pay their utility bills, including those for water, electricity, and other municipal services, through digital payment systems (Enaifoghe and Ndebele, 2023). To provide people with a variety of payment choices, the municipality collaborates with banks, payment gateways, and mobile network carriers. In order to improve service delivery, update utility infrastructure, and encourage sustainable resource management techniques, the BCMM has implemented smart metering solutions for both water and electricity (Benyera, 2022). With the use of cutting-edge technology, smart meters allow for the real-time monitoring of power and water usage at specific homes or locations. Through real-time monitoring of power and water use patterns made possible by smart metering, BCMM is able to proactively detect leaks, abnormal usage and sabotage.

The Intsika Yethu Municipality also introduced digital payment systems to offer residents the convenience of settling their bills from the comfort of their homes or on-the-go, eliminating the need to visit physical payment centers. Digital payment systems simplify billing and collection operations by automating payment

processes and minimizing human participation (Scholtz and van der Hoogen, 2022). This results in quicker processing times and better revenue management. Thus, regardless of a resident's location or banking status, digital payment systems encourage financial inclusion by giving everyone access to electronic payment channels.

Through a variety of social media channels, the Amathole District Municipality (ADM) regularly engages with the public to promote communication, offer updates on municipal services, respond to questions and concerns, and get input on the municipality's operations (Sokolow, 2020; Shava, 2022). Popular social media sites like Facebook, Twitter and Instagram are home to official ADM profiles that let locals follow the municipality, communicate with officials, and keep up to date on news and activities. ADM can notify locals in a timely manner about things like road closures, service interruptions, public notices, and community projects through social media channels. Van der Hoogen et al. (2024) affirm that social media gives people a way to communicate with ADM directly, report problems, ask questions, and offer feedback to all of which promote accountability and transparency. By encouraging connections, publicizing local events, and highlighting accomplishments within the community, social media involvement aids ADM in creating a feeling of community and belonging among its members. ADM responds to questions and concerns from the public, posts updates on service delivery initiatives, shares instructional materials on energy and water conservation, and requests feedback on municipal policies and projects (Bibri and Krogstie, 2020).

The Chris Hani District Municipality (CHDM) has used digital governance initiatives with great success, aiming to increase administrative efficiency, foster transparency, and improve service delivery. CHDM has acknowledged that a strong ICT infrastructure is necessary to successfully execute digital governance programs. To guarantee dependable and fast access throughout its administrative divisions and service delivery locations, the municipality has made investments in modernizing its ICT infrastructure, including broadband connectivity, network systems, and hardware/software resources (Nel and Masilela, 2020). The current networking hardware, servers, storage systems, and communication technologies that are being deployed as part of the ICT infrastructure upgrades will enable the staff, stakeholders, and inhabitants of CHDM to utilize a variety of digital services, apps, and platforms. In order to provide personnel and stakeholders with dependable connectivity and high-speed internet access, the CHDM has made investments in growing its fiber optic network infrastructure to link its administrative offices, municipal facilities, and service delivery sites (Hund et al., 2021). To accommodate its expanding offering of digital services, the municipality has also modernized its data centers with cutting-edge servers, storage arrays and virtualization technologies.

The OR Tambo District Municipality has started e-government projects to increase citizen engagement, optimize service delivery efficiency, and digitize and streamline administrative procedures. These initiatives use digital technology to streamline repetitive chores, enhance online communication, and offer easy access to public services and data (Beltagui et al., 2020). A variety of digital services and apps are included in the e-government efforts, catering to the requirements of enterprises, government organizations, and individuals alike. Online permit applications for building projects, online vendor procurement platforms, electronic document management systems, and citizen service portals are a few instances of online services. Mbambo (2019) acknowledges that the e-government programs save time and effort by eliminating the need for in-person trips to government offices by providing businesses and citizens with easy online access to government services and information.

The Joe Gqabi District Municipality has established open data in an effort to encourage accountability, openness, and public involvement in governance. These platforms allow people, researchers, and corporations to openly access and analyze municipal data and information in machine-readable formats that are standardized (Benyera, 2022). By providing public access to government data, open data platforms promote accountability and trust in government decision-making and operations. By allowing developers, academics, and entrepreneurs to examine and expand upon municipal datasets to provide new apps, services, and insights that benefit the community, open data fosters creativity and collaboration (Enaifoghe and Ndebele, 2023). The public data platform of the Joe Gqabi District Municipality offers access to datasets including economic statistics, environmental indicators, infrastructure assets, population demographics, and service delivery performance (Shava and Vyas-Doorgapersad, 2023). This data can be used by businesses, researchers, and citizens to examine patterns, spot possibilities, and support efforts aimed at promoting civic involvement and evidence-based decision-making.

4. Methodology

This article is based on a qualitative secondary literature review. Both grey and academic literature identified using 'digital governance' as the key word in Eastern Cape Municipalities and South African Municipalities were reviewed. Literature review was combined with abstraction since some of the issues raised in the article require in-depth analysis and not mere empirical evidence that is in the form of numbers as in quantitative studies or direct quotations of qualitative studies. The documents selected were widely published on digital governance issues, fourth industrial revolution, e-government and digital innovation informed the writing of this article. There was no rigid criterion used to identify the texts that were used in this article. Instead, the author relied on texts that provided detailed information on particular digital governance in Eastern Cape as well in South African municipalities that are summarised in this study. This loose research approach, however, presents a particular limitation. It is the author's conviction that future researchers will be motivated to engage in writing more articles on the implementation of digital governance in the South African public sector.

5. Discussions of findings

As municipalities integrate advanced technologies, they encounter both significant improvements and notable challenges, which are essential for guiding future strategies in public administration. The findings below outline the core aspects of digital governance's impact on enhancing service delivery mechanisms, with an emphasis on the efficiency and responsiveness of municipal operations. These findings also shed light on the strategic areas where digital tools have been most effective and where they have fallen short. Table 1 summarises these key impacts and challenges, providing a clear juxtaposition of the benefits against the hurdles faced during implementation. The table serves as a critical reference point for understanding the specific outcomes associated with the adoption of digital governance strategies within the context of Eastern Cape municipalities.

5.1. The impact of digital governance on service delivery

The adoption of digital governance across municipalities has led to improved service delivery and citizen satisfaction. The municipality launched an online platform where residents can report various service issues,

such as potholes, faulty streetlights, and illegal dumping. This initiative has led to faster response times and more efficient allocation of resources to address maintenance and infrastructure issues. Nel and Masilela (2020) assert that Nelson Mandela Bay Municipality revamped its website to provide comprehensive information about municipal services, projects, and budgets. By enhancing transparency, the municipality has improved accountability and fostered greater trust among residents. Through the implementation of data analytics tools, the municipality has been able to identify patterns and trends in service requests, allowing for targeted interventions in areas with the greatest needs (Nokele and Mukonza, 2021). For example, data analysis revealed a high demand for public transportation in certain neighborhoods, prompting the municipality to adjust bus routes and schedules accordingly.

Table 1. The table below shows a summary of the findings emanating from the study

Impact of digital governance on service delivery	Challenges associated with digital governance
Effective, efficient and foster transparency service delivery.	Lack adequate ICT infrastructure
Faster response times and more efficient allocation of resources in municipalities	Resource constraints and funding limitations
Improved financial management in municipalities	Lack the necessary skills and capacity
Interact with the municipality effectively and conveniently via their cellphones or tablets.	Socio-economic disparities
Empowers rural communities to engage more actively with municipal governance processes	Resistance to change and organizational culture
Easy access to a range of municipal services eg paying utility bills, requesting permits and licenses	Digital divide and inequitable Access
Digital payment systems to offer residents the convenience of settling their bills from the comfort of their homes	Data privacy and security concerns

5.2. The impact of digital governance on service delivery

The adoption of digital governance across municipalities has led to improved service delivery and citizen satisfaction. The municipality launched an online platform where residents can report various service issues, such as potholes, faulty streetlights, and illegal dumping. This initiative has led to faster response times and more efficient allocation of resources to address maintenance and infrastructure issues. Nel and Masilela (2020) assert that Nelson Mandela Bay Municipality revamped its website to provide comprehensive information about municipal services, projects, and budgets. By enhancing transparency, the municipality has improved accountability and fostered greater trust among residents. Through the implementation of data analytics tools, the municipality has been able to identify patterns and trends in service requests, allowing for targeted interventions in areas with the greatest needs (Nokele and Mukonza, 2021). For example, data analysis revealed a high demand for public transportation in certain neighborhoods, prompting the municipality to adjust bus routes and schedules accordingly.

According to Mkosana (2022) the Buffalo City Metropolitan Municipality digitized its billing and payment systems, allowing residents to pay utility bills online. This has streamlined the billing process, reducing errors

and delays in revenue collection. As a result, the municipality has improved its financial management and can allocate resources more effectively to service delivery initiatives. The municipality established a mobile app where residents can submit feedback and complaints about municipal services. This direct line of communication has enabled the municipality to address issues promptly and proactively engage with the community to identify areas for improvement (Mbambo, 2019). The Buffalo City Metropolitan Municipality has implemented smart sensors in key infrastructure assets, such as water pipes and streetlights, to monitor performance and detect maintenance needs in real-time (Mbambo, 2019). By leveraging technology to proactively manage infrastructure, the municipality has reduced downtime and minimized service disruptions for residents.

Furthermore, the Chris Hani District Municipality launched a project to improve internet connectivity in rural areas, providing residents with access to online services and information. This initiative has bridged the digital divide and empowered rural communities to engage more actively with municipal governance processes (Muthoni and Mkhonto, 2019). The municipality introduced e-government services, allowing residents to access government forms, permits, and applications online. This has simplified administrative procedures and reduced the need for residents to travel long distances to access government offices, particularly benefiting those in remote areas (Fan et al., 2022). Recognizing the importance of digital literacy, Chris Hani District Municipality initiated training programs to equip residents with the necessary skills to utilize digital services effectively. By investing in human capital development, the municipality has ensured that its digital governance initiatives are accessible and inclusive for all residents.

5.3. Challenges of digital governance

Implementing digital governance initiatives in Eastern Cape municipalities faces several challenges and barriers, which can hinder the effective adoption and utilization of digital technologies for improved service delivery and governance.

5.3.1. Lack adequate ICT infrastructure and reliable internet connectivity

The Eastern Cape region has a large number of municipalities that, especially in rural and underprivileged regions, lack adequate ICT infrastructure and consistent internet connectivity. This makes it more difficult to carry out digital governance programs that depend on internet-based technologies. Ndebele and Enaifoghe (2024) acknowledged that infrastructure limitations hinder the effective implementation of digital governance initiatives and limit citizens' access to online services. It is challenging to implement online platforms and e-government solutions for citizen engagement and service delivery in municipalities. In the Alfred Nzo District Municipality, rural areas often experience limited internet connectivity due to a lack of infrastructure investment. This hampers the effectiveness of digital governance initiatives such as online service requests and citizen engagement platforms, as residents face difficulties accessing these resources (Velsberg et al., 2020). The municipality faces difficulties in putting digital governance programmes into action because remote regions do not have broadband infrastructure or internet connectivity. Implementing online service portals or e-government platforms to allow individuals to access municipal services becomes difficult when a sizable percentage of the population lacks access to the internet or dependable connectivity (Enaifoghe et al., 2023). This makes it more difficult to encourage digital inclusiveness and public participation in government processes.

Furthermore, the OR Tambo District Municipality includes peri-urban and rural areas with poor ICT connectivity and infrastructure, which is made worse by geographical barriers including isolated communities and steep terrain (OR Tambo District Municipality Annual Report, 2022/23). The implementation of digital governance projects is impeded by the municipality's challenges in establishing dependable ICT infrastructure and internet connectivity in remote locations. The OR Tambo District Municipality is having trouble putting digital payment methods for service fees or online communication platforms for public involvement in place. Due to connectivity problems, people living in rural areas have little to no access to internet platforms, which makes it difficult for them to interact with government operations and municipal services (Shava, 2022).

In addition to financial difficulties, Mbizana Local Municipality is distinguished by rural populations with restricted access to ICT infrastructure and connection. The lack of dependable internet access in Mbizana Local Municipality makes it difficult to implement digital platforms for online service delivery or public interaction (Nel and Masilela, 2020). Locals' participation in public consultations, internet services, and municipal information access are restricted, which limits their ability to participate in local governance processes.

5.3.2. Resource constraints and funding limitations

Municipalities frequently encounter budgetary difficulties and resource shortages that limit their capacity to make investments in the software, hardware, and human capital needed for the effective implementation of digital governance (Lyytinen et al., 2016). Enaifoghe and Ndebele (2023) mention that the implementation of digital projects is hampered by municipalities like Raymond Mhlaba and Umzimvubu that lack the funds to create bespoke software, acquire and maintain ICT equipment, or train employees in digital skills. Financial limitations prevent the municipality from investing in the software, hardware, and human resources required for digital governance projects (Muthoni and Mkhonto, 2019). Due to financial constraints, Engcobo Municipality finds it difficult to purchase and maintain contemporary ICT equipment, such as computers, servers, and networking devices. Furthermore, the municipality faces financial limitations that impede its capacity to offer staff training programs aimed at enhancing their digital abilities, which are essential for the effective execution of digital governance initiatives (Lyytinen et al., 2016).

Mhlontlo Local Municipality is another rural municipality in the Eastern Cape with limited financial resources. The municipality is unable to invest in software solutions and technology infrastructure for digital governance due to budgetary constraints. The Mhlontlo municipality faces challenges in allocating funding for the purchase and upgrade of software products that are essential for putting digital governance efforts into action, including online service portals or e-government platforms (Soga and Vyas-Doorgapersad, 2022). Budgetary restrictions also make it difficult for the municipality to hire and retain IT specialists, which limits its use of in-house knowledge for digital projects.

In the Eastern Cape, the Mbashe Local Municipality is primarily a rural municipality with little potential for income production. Due to its limited resources, the municipality finds it difficult to fund the acquisition of qualified staff and technological infrastructure necessary for digital administration. Funding for capital ICT infrastructure improvements, including network infrastructure upgrades or cybersecurity measures, is difficult for Mbashe Municipality to come by (Shava, 2022). Furthermore, the municipality encounters challenges in funding continuous operating expenditures linked to upholding digital systems and recruiting competent IT personnel, hence impeding its capacity to continue digital governance programs in the long run

(Sokolow, 2020). The implementation of digital governance initiatives is significantly impeded by the budget and resource limits that Eastern Cape municipalities face.

5.3.3. Lack of technological capacity and skills

Municipal officials and citizens lack the necessary skills and capacity to effectively utilize digital tools and platforms for governance purposes. Shava (2022) affirm that without sufficient training, employees encounter difficulties in using digital systems for tasks such as data analysis or online service delivery, impacting service quality and efficiency. In the Buffalo City Metropolitan Municipality, there is a need for comprehensive training programs to enhance digital literacy among municipal staff (Shava and Vyas-Doorgapersad, 2022). Municipalities are not equipped with the necessary technological know-how to efficiently develop, carry out, and manage digital governance initiatives. This includes expertise in fields like cybersecurity, data analytics, software development, and ICT management. Due to financial limitations and rivalry from the business sector, small municipalities such as Great Kei local municipality find it difficult to attract and retain IT experts with the requisite experience (Velsberg et al., 2020). Consequently, the municipality encounters difficulties in efficiently overseeing and maintaining digital governance programmes. Rodriguez-Roman (2021) opines that the Great Kei local municipality is devoid of individuals with the necessary skills to create and maintain software applications for e-government platforms or to apply cybersecurity measures to safeguard critical municipal data.

The Intsika Yethu Local Municipality is another small rural municipality in the Eastern Cape with limited technical capacity. In crucial areas of digital governance, like data analytics and ICT management, the municipality lacks qualified staff (Bibri and Krogstie, 2020). Intsika Yethu Municipality finds it difficult to hire IT specialists with data analytics experience so that they can make defensible decisions using insights from data. The municipality faces difficulties in maximizing service delivery, identifying areas for improvement, and successfully meeting citizen requirements in the absence of qualified staff to study and interpret data (van der Hoogen et al., 2024). Furthermore, the municipality lacks the ICT management personnel needed to supervise the execution of digital initiatives and guarantee their smooth running.

The Sengu local municipality located in the Joe Gqabi District Municipality is primarily agricultural and has little technological capabilities. According to Mohanty and Mishra (2020) the municipality is deficient in software development and cybersecurity knowledge, which are essential for carrying out digital governance projects. Because there are not enough qualified software developers, Sengu municipality finds it difficult to create custom software for online service portals or e-government platforms. The lack of cybersecurity professionals also presents difficulties for the municipality in maintaining the security of digital systems and shielding private citizen data from online attacks. Majchrzak and Griffith (2020) point out that the municipality finds it difficult to fully utilize digital technology for enhanced governance and service delivery in the absence of the requisite technical competence and expertise.

5.3.4. Digital divide and inequitable access

The digital divide persists in the Eastern Cape, with disparities in access to digital technologies and skills between urban and rural areas, as well as socio-economic groups. Limited access to devices, internet connectivity, and digital literacy skills exacerbates inequalities in accessing and benefiting from digital

governance services (Sokolow, 2020). The disparities already in place are made worse by differences in access to and use of digital technology, especially in rural and underprivileged communities. The implementation of inclusive digital governance projects that address the demands of all people is impeded by the digital divide. Due to limited access to digital devices, low rates of digital literacy, and language barriers, municipalities like Ntabankulu, Umzimvubu, and Matatiele in the Alfred Nzou District Municipality struggle to provide digital services to remote communities, which results in exclusion and unfair service delivery (Oqhuvhu et al., 2022). Access to and use of digital technologies in these municipalities varies greatly, especially in outlying villages and underprivileged areas. According to Mohanty and Mishra (2020), people living in isolated areas could not have access to computers, cellphones, tablets, or other digital devices, nor to dependable internet.

The Inxuba Yethemba Local Municipality is another rural municipality in the Eastern Cape with limited infrastructure and resources. There are gaps in the municipality's access to digital technology, especially in rural areas with spotty internet service. Using internet-based technology to undertake digital governance projects presents problems for the Inxuba Yethemba Local Municipality. It is challenging for members of marginalized communities to interact with online platforms and use digital services since they have restricted access to digital devices and face low rates of digital literacy (Enaifoghe and Ndebele, 2023). The lack of access to digital resources makes social inequality worse and makes it more difficult for locals to engage in political processes.

The Chris Hani District Municipality encompasses vast rural areas with no access to digital infrastructure. It will be difficult for the district municipality to close the digital divide and guarantee that everyone under its control has fair access to digital technology (Appio et al., 2019). It may be difficult for residents in remote communities and informal settlements to access online resources for government information or services, which makes it more difficult for them to participate in local governance and decision-making processes (Bibri and Krogstie, 2020). More so, in the OR Tambo District Municipality, marginalized communities in remote rural areas often lack access to basic digital resources such as computers and smartphones (Vyas-Doorgapersad, 2022). As a result, initiatives like online citizen feedback mechanisms or e-government services may exclude these communities, widening the digital divide.

5.3.5. Resistance to change and organizational culture

The implementation of digital governance efforts in municipalities may be hindered by entrenched organizational cultures and resistance to change. Development is hampered by bureaucratic inertia, a lack of support from stakeholders, and opposition to new technologies. Employees used to traditional paper-based processes and dubious of digital transformation initiatives struggle to cooperate with municipalities such as Ndlambe, Raymond Mhlaba, and Nelson Mandela Bay Metropolitan Municipality (Benyera, 2022). Furthermore, Raymond Mhlaba Local Municipality is a local municipality under Amathole District Municipality struggles with bureaucratic processes and a traditional organizational culture.

More so, Sakhisizwe Local Municipality is another small municipality with a conservative organizational culture. Leadership and employees of the municipality are resistant to change because they see digital governance projects as sources of extra labour or as a danger to their jobs (Muthoni and Mkhonto, 2019). Due to worries about job displacement or an increase in administrative load, the Sakhisizwe Municipality finds it difficult to secure support from stakeholders for digital governance initiatives. The municipality finds it

difficult to overcome opposition to change and successfully adopt digital initiatives to enhance governance and service delivery in the absence of leadership support and worker participation (Majchrzak and Griffith, 2020).

Another municipality that is deeply ingrained in hierarchical organizational culture and bureaucratic processes is Amahlathi Local Municipality. Middle and senior management at the municipality is resistant to change since they don't want to give up control and adopt new procedures (Nel and Masilela, 2020). Additionally, the department heads and senior managers of the Ingquza Hill Local Municipality are reluctant to decentralize decision-making or empower frontline staff, which makes it difficult for the municipality to lead digital governance efforts. The municipality finds it difficult to overcome bureaucratic inertia and implement digital solutions that improve service delivery and streamline operations in the absence of leadership alignment and an innovative culture (Hund et al., 2021).

5.3.6. Data privacy and security concerns

Data privacy and security concerns are paramount in digital governance initiatives, especially considering the sensitive nature of the information collected and processed. Inadequate safeguards can lead to severe consequences such as data breaches, identity theft, and loss of public trust. Digital governance initiatives involve the collection, storage, and processing of vast amounts of personal and sensitive data, including citizen information, financial records, and transactional data (Muthoni and Mkhonto, 2019; Mkosana, 2022). This data is often stored in online databases and accessed through various digital platforms, posing inherent risks to privacy and security. Ndebele and Enaifoghe (2024) pointed out that without robust security measures, digital systems are vulnerable to cyber-attacks and data breaches. Unauthorized access to sensitive information can result in financial loss, reputational damage, and legal liabilities. Personal information stored in digital databases can be exploited by cybercriminals for identification of theft and fraud (Mbambo, 2019). This poses a significant risk to citizens' financial security and privacy. Public trust in government institutions can be eroded if citizens perceive their personal information to be insecure or misused (Scholtz and van der Hoogen, 2022). A breach of trust can undermine the adoption and effectiveness of digital governance initiatives.

In the Nelson Mandela Bay Municipality, concerns have been raised about the security of citizens' personal information stored in online databases. For example, the municipality collects and stores data related to residents' utility bills, property taxes, and service requests through its digital platforms (Mensah et al., 2022). However, without robust data protection measures in place, such as encryption, access controls, and regular security audits, there is a risk of data breaches or unauthorized access to this sensitive information. In the event of a breach, citizens' personal and financial data could be compromised, leading to identity theft, financial fraud, and other malicious activities.

5.3.7. Socio-economic disparities

Socio-economic disparities within the Eastern Cape province contribute to uneven access to digital technologies and resources. Vulnerable populations, including low-income households and marginalized communities, face greater barriers to accessing and benefiting from digital governance services (Nokele and Mukonza, 2021). In the Chris Hani District Municipality, impoverished communities in informal settlements often lack access to basic amenities such as electricity and running water, let alone digital infrastructure (Ali

and Anwar, 2021). Implementing digital governance initiatives in these areas requires targeted interventions to address underlying socio-economic inequalities and ensure inclusivity.

Socio-economic disparities also affect levels of digital literacy and skills within communities. Bibri and Krogstie (2020) emphasize that affluent individuals and households are more likely to have access to education and training opportunities, enabling them to navigate digital platforms effectively. In the OR Tambo District Municipality, efforts to implement digital literacy programs in partnership with local schools and community centers face challenges due to limited resources and infrastructure (Scholtz and van der Hoogen, 2022). As a result, residents in rural areas may have lower levels of digital literacy compared to their urban counterparts.

6. Recommendations

To adapt and thrive in the digital era, Eastern Cape municipalities can overcome the challenges associated with digital governance and unlock the full potential of technology to improve service delivery and governance outcomes for all residents can consider implementing the following recommendations.

6.1. Infrastructure development

Municipalities are recommended to conduct comprehensive assessments of existing IT infrastructure in each municipality to identify gaps and prioritize investment in critical areas such as broadband connectivity and data centers. They need to collaborate with telecommunications providers and government agencies to expand broadband coverage in underserved areas, focusing on rural communities and informal settlements. Municipalities are encouraged to establish partnerships with private sector entities to leverage their expertise and resources for infrastructure development projects, such as deploying fiber-optic networks and upgrading data storage facilities.

6.2. Digital inclusion and accessibility

To ensure equitable access to digital services, municipalities must implement strategies to bridge this divide, such as expanding internet connectivity infrastructure and providing training and support to marginalized communities. Municipalities are recommended to develop targeted programs to bridge the digital divide and promote digital literacy among marginalized communities. They should establish community-based digital centers or mobile internet hubs to provide access to digital resources and training in remote areas. Municipalities must implement inclusive design principles in digital governance platforms to ensure accessibility for people with disabilities, including features such as screen readers, voice commands, and alternative input methods.

6.3. Capacity building and training initiatives

Municipalities need to invest in building the technical expertise of staff, developing digital literacy programs, and fostering partnerships with external stakeholders, such as academic institutions and private sector organizations. Municipalities are recommended to collaborate with educational institutions and industry partners to offer specialized training in areas such as data analytics, cybersecurity, and digital project

management. This can be done through the establishment of a centralized training hub or online learning platform to provide ongoing support and resources for staff development, including webinars, tutorials, and certification programs. Furthermore, there is need to foster a culture of innovation and knowledge sharing within municipalities by incentivizing staff participation in digital projects, hackathons, and cross-departmental collaborations.

6.4. Data privacy and security

Municipalities are encouraged to develop robust data protection policies and procedures to safeguard citizens' personal information and ensure compliance with data privacy regulations. Municipalities must implement robust data protection measures, including encryption, access controls, and multi-factor authentication, to safeguard citizens' personal data and mitigate the risk of data breaches. Moreover, municipalities are recommended to raise awareness among citizens about their rights and responsibilities regarding data privacy and security. Municipalities must develop and enforce clear policies and procedures for data handling, storage, and disposal, ensuring compliance with relevant regulations such as the Protection of Personal Information Act (POPIA).

6.5. Socio-economic empowerment

Municipalities are encouraged to address underlying socio-economic disparities through targeted development interventions, including access to basic services, education, and economic opportunities. Municipalities are encouraged to engage with community stakeholders and civil society organizations to identify and prioritize the needs of vulnerable populations in digital governance initiatives. More importantly there is a need to promote inclusive decision-making processes that involve diverse stakeholders, including marginalized communities, in the design and implementation of digital projects. The municipalities should empower communities to co-create and co-manage digital solutions that address their specific needs and priorities, fostering a sense of ownership and sustainability.

6.6. Monitoring and Evaluation of digital devices

Municipalities are encouraged to establish mechanisms for monitoring and evaluating the impact of digital governance initiatives on service delivery outcomes. It is imperative that municipalities collect data and feedback from citizens to assess the effectiveness of digital platforms and identify areas for improvement. Regularly review and update digital governance strategies based on lessons learned and emerging best practices.

7. Conclusion

Digital governance holds immense potential for transforming service delivery and governance practices in Eastern Cape municipalities. By leveraging digital technologies, municipalities can enhance efficiency, transparency, and citizen engagement, ultimately improving the quality of life for residents across the province. Digital solutions such as e-governance platforms, mobile applications, and data analytics tools enable

municipalities to streamline administrative processes, reduce bureaucratic hurdles and deliver services more promptly to residents. Moreover, the transparency facilitated by digital governance empowers citizens by providing them with access to government information and decision-making processes, fostering trust and accountability between government institutions and the public.

While digital governance holds promise for enhancing the accessibility, efficiency, and transparency of service delivery processes, its implementation is not without challenges. Infrastructure deficits, digital literacy gaps, and resource constraints continue to impede the full realization of digital governance's benefits across Eastern Cape municipalities. Moreover, concerns regarding data privacy, cybersecurity, and digital exclusion underscore the importance of adopting inclusive and rights-based approaches to digital transformation.

The journey towards realizing the full potential of digital governance in improving service delivery within Eastern Cape municipalities is ongoing. By harnessing the power of technology while remaining attentive to the unique socio-economic and cultural contexts of local communities, municipalities can pave the way for more responsive, equitable, and citizen-centric governance systems. As municipalities navigate the complexities of the digital age, municipalities should remain committed to harnessing technology as a force for positive change and collective empowerment in the pursuit of a better future for all residents of the Eastern Cape.

Acknowledgements

The author acknowledges the University of Johannesburg for its affiliation support.

References

- Ali, B. and Anwar, G. (2021), "Factors Influencing the Citizens' Acceptance of Electronic Government", *International Journal of Engineering, Business and Management*, Vol. 5 No. 1, pp. 48-60.
- Anttiroiko, A. (2007), "Democratic E-Governance: Basic Concepts, Issues and Future Trends", *Journal of E-Government Policy and Regulation*, Vol. 30. No. 3, pp. 83-90.
- Apleni, A. and Smuts, H. (2020), "An e-government implementation framework: A developing country case study", *International Federation for Information Processing*, Vol. 1 No. 2, pp. 15-27.
- Appio, F.P., Lima, M. and Paroutis, S. (2019), "Understanding Smart Cities: Innovation ecosystems, technological advancements, and societal challenges", *Journal of Techno Forecast. Social Change*, Vol. 14 No. 2, pp. 1-14.
- Beltagui, A., Rosli, A. and Candi, M. (2020), "Exaptation in a digital innovation ecosystem: The disruptive impacts of 3D printing", *Research Policy*, Vol. 4 No. 9, pp. 1-16.
- Benyera, E. (2022), "The colonial state is the problem in Africa", In: Benyera E (ed), *Reimagining justice, human rights and leadership in Africa: challenging discourse and searching for alternative paths*. Springer, Cham, pp. 21-38.
- Bibri, S. and Krogstie, J. (2020), "The emerging data-driven Smart City and its innovative applied solutions for sustainability: The cases of London and Barcelona", *Energy Inform*, Vol. 3 No. 1, pp. 2-42.

- Collins, A.E. (2009), *Disaster and Development Perspectives in Development Series*, Routledge, London.
- Enaifoghe, A. and Ndebele, N.C. (2023), "Examining the barriers to the adoption and integration of information communication technologies as e-Government in Africa", *International Journal of Research in Business and Social Science*, Vol. 12 No. 7, pp. 383-393.
- Enaifoghe, A., Dlamini, N.P., Jili, N.N. and Mthethwa, R. (2023), "The Role of E-Government as Enabler of Good Governance for Socio-Economic Development in South Africa", *International Journal of Social Science Research and Review*, Vol. 6 No. 1, pp. 493-508.
- Faloyi, S. and Ajoyi, N. (2021). "Understanding the impact of the digital divide on South African students in higher educational institutions", *African Journal of Science, Technology, Innovation and Development*, Vol. 3 No. 1, pp. 1-11.
- Fan, M., Epadile, M., Qalati, S.A. and Qureshi, N.A. (2022), "The effects of e-government efficiency on subjective wellbeing", *Frontiers in Psychology*, Vol. 1 No. 3, pp. 1-15.
- Fraga, C.G. and Oteiza, P.I. (2002), "Iron toxicity and antioxidant nutrients", *Toxicology*, Vol. 1 No. 8, pp. 23-32.
- Grigalashvili, V. (2022), "Conceptual Dimensions of Electronic Government And Electronic Governance in The Domain Of Digital Democracy", *International Journal of Scientific and Management Research*, Vol. 5 No. 1, pp. 1-15.
- Hoag, C. (2014), "Dereliction at the South African department of home affairs: Time for anthropology of bureaucracy", *Critique of Anthropology*, Vol. 34 No. 4, pp. 410-428.
- Hund, A., Wagner, H., Beimborn, D. and Weitzel, T. (2021). "Digital Innovation: Review and novel perspective", *The Journal of Strategic Information Systems*, Vol. 30 No. 4, pp. 1-39.
- Jakoet-Salie, A. (2020), "E-government Strategies in South Africa: A plausible attempt at effective delivery of services", *Administratio Publica*, Vol. 28 No. 3, pp. 1-22.
- Kanyemba, D. (2017), "E-government innovations for effective service delivery. A case of the Gauteng Department of Education online application", Unpublished Masters dissertation, North West University, South Africa.
- Kashaija, L.S. (2022), "E-records Management Readiness for Implementation of E-Government in Local Authorities of Singida Municipal Council", *Journal of the South African Society of Archivists*, Vol. 5 No. 5, pp. 41-55.
- Lyytinen, K., Yoo, Y. and Boland, R.J. (2016), "Digital product innovation within four classes of innovation networks", *Information Systems Journal*, Vol. 26 No. 1, pp. 47-75.
- Majchrzak, A. and Griffith, T.L. (2020), "The new wave of digital innovation: The need for a theory of sociotechnical self-orchestration", in: Nambisan, S., Lyytinen, K. and Youngjin, Y. (eds), *Handbook of Digital Innovation*. Elger, pp. 11-40.
- Malomane, A.P. (2021), "The role of e-governance as an alternative services delivery mechanism in local government", Unpublished MPA mini dissertation, University of Johannesburg.
- Marche, S. and McNiven, J.D. (2003), "E-Government and E-Governance: The Future Isn't What it used to Be", *Canadian Journal of Administrative Sciences*, Vol. 20 No. 1, pp. 74-86.

- Mbambo, M.E. (2019), "Analysis of clients perceptions of service delivery in the Department of Home Affairs, Welkom Regional office, South Africa: A TQM Perspective", Unpublished MPA mini dissertation, Central University of Technology, Bloemfontein, South Africa.
- Mensah, I.K., Zeng, G. and Mwakapesa, D.S. (2022), "Understanding the drivers of the public value of e-government: Validation of a public value e-government adoption model", *Frontiers in psychology*, Vol. 1 No. 3, pp. 1-16.
- Mkosana, V. (2022), "A critical assessment of the inter-government relations clusters system in the South African Local government context: The case of Raymond Mhlaba municipality by infrastructure", Unpublished MPA mini dissertation, University of Fort Hare, Bisho, South Africa.
- Mohanty, S. and Mishra, P.C. (2020), "Framework for understanding Internet of Things in human resource management", *Revista ESPACIOS*, Vol. 41 No. 12, pp. 1-12.
- Murenzi, P. and Olivier, B. (2019), "E-government challenges faced by selected district municipalities in South Africa and Rwanda", *Administratio Publica*, Vol. 25 No. 1, pp. 141-172.
- Muthoni, M. and Mkhonto, A. (2019), "The critical success factors for e-government implementation in South Africa's local government: Factoring in Apartheid Digital Divide", in: *IEEE 2nd International Conference on Information and Computer Technologies*, 13 June 2019, pp. 220-228.
- Ndebele, N.C. and Enaifoghe, A. (2024), "The Adoption of Innovative Strategies for Enhanced Service Delivery in the South Africa Public Sector", *Social Sciences and Education Research Review*, Vol. 10 No. 2, pp. 114-121.
- Nel, D. and Masilela, L. (2020), "Open Governance for Improved Service Delivery Innovation in South Africa", *International Journal of eBusiness and eGovernment Studies*, Vol. 12 No. 1, pp. 33-47.
- Ngcamu, B.S. (2019), "Exploring service delivery protests in Post-Apartheid South African Municipalities: A literature review", *The Journal for Transdisciplinary Research in Southern Africa*, Vol. 1 No. 5, pp. 1-16.
- Nokele, K.S. and Mukonza, R.M. (2021), "The adoption of e-government in the department of Home Affairs: Unpacking the underlying factor affecting adoption of e-government within the selected service centres in Limpopo province South Africa", *African Journal of Governance and Development*, Vol. 10 No. 1, pp. 98-116
- Oqhuvhu, E.A., Gherevbie, D.E. and Oni, S.O. (2022). "E-governance in Nigeria: Challenges and prospects", *RUDN Journal of Public Administration*, Vol. 9 No. 2, pp. 189-199.
- OR Tambo District Municipality Annual Report (2022/23), OR Tambo District Municipality. Eastern Cape. South Africa.
- Rodriquez-Roman, R. (2021), "Digital government in local governments in Latin America", *Koinonia Interdisciplinary Refereed Journal*, Vol. 6 No. 11, pp. 163-179.
- Scholtz, B. and van der Hoogen, A. (2022), "Access to Technology and Data in Smart Cities for South African Digital Citizens", In: *Proceedings of the African Conference on Information Systems and Technology, September 17-19*. Thyolo, Malawi, pp. 43-50.
- Shava, E. (2022), "Survival of African Governments in the Fourth Industrial Revolution," *Advances in African Economic, Social and Political Development*, in: Everisto Benyera (ed.), *Africa and the Fourth Industrial Revolution*, pp. 125-144, Springer, Cham.

- Shava, E. and Vyas-Doorgapersad, S. (2022), "Fostering digital innovations to accelerate service delivery in South African Local Government", *International Journal of Research in Business and Social Science*, Vol.11 No. 2, pp. 83-91.
- Shava, E. and Vyas-Doorgapersad, S. (2023), "Inclusive participation in information and communication technologies (ICT) processes for smart services in the city of Johannesburg", *Insights into Regional Development*, Vol. 5 No. 1, pp. 26-40.
- Soga, B. and Vyas-Doorgapersad, S. (2022), "The use of e-government services by small businesses in municipalities", *EUREKA: Social and Humanities*, Vol. 6 No. 92, pp. 104.
- Sokolow, A. (2020), South Africa's Fourth Industrial Revolution limited by lack of computer literacy, access. MEDILL Reports Chicago. Retrieved from: <https://news.medill.northwestern.edu/chicago/south-africas-fourth-industrialrevolution-limited-by-lack-of-computer-literacy-access> (Accessed on 16 February 2024).
- Udovita, P. (2020), "Conceptual review on dimensions of digital transformation in modern era", *International Journal of Scientific and Research Publications*, Vol. 10 No. 2, pp. 520-529.
- van der Hoogen, A., Fashoro, I., Calitz, A.P. and Luke, L.A. (2024), "Digital Transformation Framework for Smart Municipalities", *Sustainability*, Vol. 1 No. 6, pp. 13-20.
- Velsberg, O., Westergren, U.H. and Jonsson, K. (2020), "Exploring smartness in public sector innovation – creating smart public services with the Internet of Things", *European Journal of Information Systems*, Vol. 29 No. 4, pp. 350-368.
- Vyas-Doorgapersad, S. (2022), "The use of digitalization (ICTs) in achieving sustainable development goals", *Global Journal of Emerging Market Economies*, Vol. 2 No. 3, pp. 1-4.