

## Contextual Drawbacks to Implementing Digital Systems in Selected Countries in the Southern African Public Sector: An Integrative Review

Christopher Dick-Sagoe\*, Daniel Odoom†

### Abstract

Digital transformation holds considerable promise for improving public service delivery across Africa. However, despite regional and international initiatives to advance digital governance, implementing digital systems in Southern Africa's public sector has faced persistent challenges. This study presents an integrative review of the literature on the contextual drawbacks to the adoption of digital systems in the Southern African region. The study is guided by the Technology-Organisation-Environment (TOE) framework and supported by complementary theoretical lenses. A systematic literature search, screening, and synthesis process was conducted on relevant peer-reviewed publications. Our findings show that the key technological impediments include outdated infrastructure, cybersecurity vulnerabilities, and insufficient information and communication technology (ICT) capacity. Institutional challenges stem from bureaucratic inertia, limited managerial support, digital hesitancy, and leadership instability, while environmental constraints are shaped by poor interdepartmental coordination, low citizen participation, and digital inequality. We argue that these challenges are interdependent and mutually reinforcing and therefore require a multidimensional policy response, such as targeted digital investments in underserved areas, capacity-building for public servants, user-centric system design, and institutional reforms that foster inter-agency collaboration and inclusive digital governance.

**Keywords:** Digital Systems, Digital Transformation, Implementation Challenges, Public Sector Digitalisation, Southern Africa.

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\* University of South Africa, Pretoria, South Africa; [dicksagoe@gmail.com](mailto:dicksagoe@gmail.com)

† Institute of Journalism, University of Media, Arts and Communication, Ghana; [ankahodoom@gmail.com](mailto:ankahodoom@gmail.com)

## Introduction

The Fourth Industrial Revolution has transformed the world into a digital and technology-driven society that seeks to boost governance and public administration. Because of this revolution, countries have embraced digital transformation in their public service with a view to improving the efficiency and effectiveness of public service delivery. Digital transformation has enabled developing countries to modernise public service delivery by increasing its efficiency, effectiveness, and the responsiveness of public sector employees to citizens' needs (Dick-Sagoe et al., 2021). As a concept, digital transformation defies a single established definition (Kraus et al., 2021). For instance, Martin (2008) defines digital transformation as the use of information and communication technologies (ICTs), not when minor automations are performed, but in cases where dramatically new capabilities are created in business, public government, and in the lives of people and society. This suggests that digital transformation requires the adoption of ICTs to stimulate fundamentally new skills and proficiencies in all societal and economic domains. Ebert and Duarte (2018) perceived digital transformation as the process of adopting disruptive technologies in order to improve productivity, value addition, and social welfare. The definition by Ebert and Duarte (2018) seems to align with Martin's (2008) because both definitions affirm that digital transformation will lead to massive alterations in ways of doing things and ultimately improve society.

Many countries have embraced digital transformation as key to promoting efficiency in their public service. In Africa, countries have made consistent efforts to embrace digital transformation in their public sector. For example, Kenya's "eCitizen - Gateway to All Government Services" makes it easy for citizens to access public services like immigration, transport, and business registration with ease (Kwanya, 2018). Likewise, through the "SmartBots" strategy, Botswana's government has embraced digital transformation to digitise public service provision and promote skill development and education (Mbae et al., 2025). The joint Organisation for Economic Cooperation and Development (OECD) and the African Union report on digital transformation in Africa identified several factors, including the regulatory environment, knowledge of digital skills among the population, availability of digital infrastructure and the level of investment in digital technologies by the government and businesses, that influence the use and adoption of digital technologies (AUC/OECD, 2021). Besides these challenges associated with the smooth roll-out of digitalisation in Africa, concerns such as widening existing inequalities and displacement of people from work also follow digitalisation efforts (Parfait, 2023). Technological infrastructure gaps and funding for digitalisation projects also remain a challenge. All these challenges undermine the digitalisation drive in Africa (Kelbessa, 2018; Parfait, 2023).

In the southern African region, digital transformation is not new, as it has been in implementation for over two decades in the sub-region, reaching an unprecedented degree of sophistication (Alexandru et al., 2019). It significantly helps to simplify human existence and turn humans into digital citizens (Alexandru et al., 2019). However, these technologies are still new concepts in the public sector of southern Africa. This is because most services within the sub-region are still rendered manually (Shibambu, 2024). It is envisaged that digital transformation in Southern Africa will significantly foster benefits like new employment creation, economic growth, and increased global competitiveness. Thus, both public and private organisations are encouraged to adopt digital technologies as a critical pathway to economic and social development of the region (Rakgoale et al., 2024). Scholars have argued that neglecting digital transformation may derail the growth and competitiveness of organisations in the region and ultimately impede the economic and social development of countries in the region (Gaffley & Pelsner, 2021; Rakgoale et al., 2024).

In a regional context, the Southern African Development Community (SADC) also leveraged on digital technology through the Digital SADC 2027, SADC ICT Implementing Agencies, SADC ICT Landscape and Review, Stakeholder Engagement, and EGEE-ICT Program (Thew, 2022). Several factors serve as drawbacks to digital transformation in the southern African public sector. The main challenges include financial obstacles, inadequate resource allocation priorities, and poor inter-departmental coordination (Grover & Kohli, cited in Komna & Mpungose, 2024 a). These drawbacks to digital transformation hinder the efficient implementation of digital transformation initiatives in Southern Africa (Grover & Kohli, cited in Komna & Mpungose, 2024 a).

This article, therefore, explores the contextual drawbacks to implementing digital systems in the southern African public sector. It follows a systematic review of literature to comprehensively bring out the challenges associated by digitalisation. The article provides an analysis of the policies and programmes implemented by Southern African countries in leveraging digital technology and the challenges encountered thereupon. The study explores the failed and successful digitalisation policies and programs in Africa, before cascading to Southern Africa.

## Theoretical Underpinnings

This study is underpinned by several theories and models. First, the study is grounded in the technology acceptance model (TAM), which explicates the acceptance of information technologies by people, organisations, and countries. The model posits that accepting and using information technologies provides diverse instant and long-term benefits to people, organisations,

and countries. The benefits may include improved performance, financial and time efficiency, and convenience (Odoom et al., 2024; Sharda et al., 1988). Inherent in the model is the fact that the acceptance or otherwise of a given technology depends on the users' behavioural intention, perceptions about the usefulness of the technology when undertaking the task, and the perceived ease with which they can use the technology (Davis, 1989; Odoom et al., 2024; Marikyan & Papagiannidis, 2023). In essence, the following critical factors influence the acceptance of a given technology: perceived usefulness, perceived ease of use, attitude, and behavioural intentions of its users.

Secondly, the study is guided by the design-reality gap or mismatch model, which was developed by Richard Heeks to explain the reasons behind the failure of nicely designed digital system policies in developing countries (Heeks, 2002). This model has been used to explain the implementation challenges of several digital systems, such as healthcare and land administration projects in several African countries. Such gaps in the implementation, as identified by Heeks (2002), emanate from local administrative realities (such as poor internet access and limited digital literacy) which make digital systems, which are usually donor-led and funded, difficult to use. Another important reality revealed by Heeks' "design-reality mismatches" is the adoption of digital system solutions without adequate localisation. Further, this model assesses the environmental realities within which digital systems are implemented against the deployment of digital system infrastructure itself, as a way of checking the alignment between the two.

Thirdly, institutional theory also guides this study. The theory is meant to explain how elements such as systems, processes, structures, and professions are formed and distributed within and between organisations (Greve, 2003). Institutional theory explains how power dynamics, routines and rules influence the adoption of digital systems in the public sector of developing countries (Roszkowska-Menkes, 2023; Suddaby, 2013). The theory helps in explaining the institutional mandates for the successful implementation of digital systems in developing countries. It explains the resistance from institutions, such as bureaucratic norms, institutional silos, fear of change management, and fear associated with job displacement by technology (Roszkowska-Menkes, 2023; Suddaby, 2013). Inherent in the institutional theory is the need for reforms in the public sector for digital systems and technology to thrive in the public sector. This is because the theory affirms how organisational structures, culture, and norms influence the adoption of new digital systems in the public sector. Factors like inadequate policy frameworks, fragmented coordination and weak leadership are common institutional challenges that can undermine the success of digital systems in the public sector.

Fourthly, the study is also anchored in the socio-technical systems theory, which argues for the interdependence and interplay between technical and social aspects within an organisation. The theory states that organisations employ people with capabilities, who work to achieve goals, follow laid down processes, employ technology, operate within a physical infrastructure, and share certain cultural beliefs, norms and assumptions (Abbas & Michael, 2025; Baxter & Sommerville, 2011). The theory shows how people are affected by technology and stresses the need to align digital systems projects with local social dynamics and human capacity (Abbas & Michael, 2025; Mumford, 2006). Failure to align such digital systems with local people, through the active engagement of citizens, leads to failed implementation of digital systems in the public sector. This fosters the need for policymakers to balance investment in digital systems with investment in processes and people. Social challenges associated with digital systems, like resistance from service providers and cultural misalignments, are the common types of challenges associated with sociotechnical systems theory.

Fifthly, the study draws insights from the digital divide framework, which states that digital-access divide which refers to the inequality in accessing information technology (IT) derails the adoption of IT in any social system (Dewan & Riggins, 2005). Across the Southern African region, disparities in access are experienced in rural and urban areas, youth-elderly divides and gendered gaps are experienced in the ownership of mobile phones. These divides (rural-urban, youth-elderly, and gendered gaps in mobile phone ownership) affect the digital systems in the public sector. These factors are important in that they highlight concerns related to social equity and enhance an inclusive environment. Disparities in access to digital systems in Africa are the reason for the challenges in achieving equity and improved performance in public service delivery like healthcare, education and agriculture in places such as Zambia and Botswana (Mbae et al., 2025; Milukutu & Siachisa, 2023).

Lastly, the study is guided by the technology-organisation-environment (TOE) framework, which was developed by Tornatzky and Fleischer (1990), to explain how organisational environment, technological setting, and environmental context influence the introduction of technology in the public sector. The theory argues that adoption of digital systems in the public sector is affected by three distinct institutional elements, namely technology, organisation, and environment (Defitri, Bahari, Handra & Febrianto, 2020) and provides an understanding of factors that affect the process of innovation in technology. Technological factors, according to this theory, include information and communication infrastructure and its accompanying systems and applications for rolling out digital systems in the public sector. On the other hand, organisational factors refer to internal institutional elements relevant for managing digital systems, such as the

relevant skills and competencies in using the technology, digital literacy, support from management, and funding (Anthopoulos et al. cited in Mbae et al., 2025; Das et al., 2016; Krishnan & Teo, 2012). The environmental factors represent the external factors and pressures from the business world, users/community, and government agencies (Defitri et al., 2020). The TOE theory has been adopted as the overarching theoretical framework to guide the analysis for this study, as it provides a holistic view of the internal and external forces which militate against the smooth roll-out of digital systems in the public sector of the Southern African block.

### **Digitalisation in Africa and the Southern African Region**

Digitalisation has promoted fluidity and flexibility in the working environment, which brings several opportunities for African economies. Digitalisation encourages staff to collaborate and communicate easily (Parfait, 2023). Many organisations in Africa are digitalising to enhance efficiency and create more jobs. The mobile money revolution presents a typical example of how digitalisation has drastically changed the business ecosystem in Africa, having recorded 300 million subscribers and millions of direct jobs as mobile money agents in 2018. Expanding such innovations into governance, healthcare and banking positively influences job creation, inclusive governance, healthcare and finance (Parfait, 2023).

Furthermore, digitalisation has led to job creation in the continent. Examples of new jobs that young Africans could benefit from include social media managers, cybersecurity experts, engineers, big data analysts, and virtual reality designers (Parfait, 2023). An even bigger opportunity for Africa is that an increasing number of its youthful population is gaining better and more practical education that will facilitate easy adaptation into the digital age. In Cameroon, for instance, mobile money services offer employment as agents to thousands of youths, especially to women and the vulnerable (Parfait, 2023). In Kenya and across Africa, mobile money transfers (through M-Pesa, Airtel Money or T-Kash) have spurred the creation of new jobs, and mobile banking/finance has become the go-to example of leapfrogging development: while populations in the Global North went from storing cash at home to creating bank accounts to online banking and might start adopting mobile banking in the future, Kenyans directly went from cash to mobile banking (Kwanya, 2018).

Moreover, the proliferation of mobile money services pushed several banks to roll out mobile and internet banking services in most parts of the continent (AUC/OECD, 2021; Parfait., 2023). Also, e-commerce has seen massive demand and increase in Kenya (e.g., via Kilimall or MA Soko), and land title registration online has also gained popularity (Kwanya, 2018). Internet shopping is gaining relevance throughout Africa and consumers

enjoy online websites (Kiiza, 2018). Information and Communication Technologies (ICTs) are also vital to agriculture, as digital soil maps or mobile applications (e.g., M-Farm in Kenya) help improve cultivating, harvesting, and selling agricultural products (Kelbessa, 2018).

Digitalisation in Africa has also spurred social mobilisation. One example is the documentation of human rights violations during or after Kenya's 2013 election, Kwanya, 2018). Government service provision ICT, i.e., e-government, is popular in many African countries. Also, in remote areas, telecommunications centres try to ensure the connection of citizens to national administrations (Kelbessa, 2018).

There have been various attempts at promoting digital transformation in Southern Africa. There is an effort to digitalise operations in the region despite obvious challenges with ICT implementation. For example, in South Africa, there is the smart city program dubbed "MyCiTi", which aims at achieving a greener and more equal environment and reducing socio-economic segregation, insecurity, and unemployment in the country (Pfeffer & Verrest, 2018). Although Southern Africa has made progress in its digital transformation, the region is faced with several drawbacks of digitalisation. For example, digital transformation efforts in South Africa are met with financial obstacles that impede efficient public service (Komna & Mpungose, 2024 a). The country's digital transformation postponement is often due to financial constraints and resource allocation priorities (Komna & Mpungose, 2024 a).

## Methodology

The study uses an integrative review methodology. This integrative review was based on the updated guidelines for integrative review by Whittermore and Knafl (2005). The updated guidelines were used for their ability to synthesise theoretical and empirical evidence from various methodologies to answer the research questions set for the study. Further, the multifaceted and complex nature of the study under investigation, contextual drawbacks to implementing digital systems in the Southern African public sector, necessitated the employment of a methodology such as an integrative review to investigate the different digital systems employed by the various governments in the Southern African block and the challenges associated with the use and installation of such digital systems.

The study had this research question: what are the contextual drawbacks to implementing digital systems in the Southern African public sector? This question was used to search the Elicit systematic review software, which conducted deep research of related articles from over 126 million academic research articles from the Google Scholar, Scopus, ScienceDirect, Web

of Science, and Semantic Scholar corpus. These databases were searched systematically to construct a thorough understanding of the implementation of digital systems in the public sector and the challenges associated with the implementation of digital systems. From the search, 58 related and most relevant articles were retrieved. The strategy employed the following search query for retrieval of manuscripts from the databases: "digital innovation" OR "information and communication technology" OR "open government" OR "e-government" OR "digital transformation" OR "digital systems") AND ("state institutions" OR "public institutions" OR "government" OR "public sector") AND (obstacles OR issues OR constraints OR limitation OR challenges OR drawbacks OR barriers) AND ("Eswatini" OR "Malawi" OR "Mozambique" OR "Angola" OR "Zambia" OR "Zimbabwe" OR "South Africa" OR "Namibia" OR "Lesotho" OR "Botswana" OR "Southern Africa").

To select the most suitable sources, the study set specific inclusion and exclusion criteria focusing on geographical location (Southern African countries), implementation status (focusing only on implemented digital projects in the public sector), challenges (focusing on publications that discuss the challenges associated with implementation, analyses that focus on publications that go beyond description of digital systems in the public sector), and publications that make use of the English language. To ensure a strong focus on digital systems in the public sector is achieved, publications that touched briefly on digital systems in the public sector were excluded. The inclusion criteria were used based on the selected 58 publications, and 17 publications were finally selected that met the following inclusion criteria: Geographical and sectoral focus: articles that focused on the public sector organisations of Southern African countries (one or more), such as Zimbabwe, Zambia, South Africa, Namibia, Mozambique, Malawi, Lesotho, Eswatini, Botswana, and Angola were selected.

Implementation status: articles that focused on public sector digital systems or government technology or government digital systems or state-institutional digital systems, digital transformation initiatives, or e-government that have been implemented were used. By this, the study focuses on actual digital system projects that are implemented in the public sector of Southern African countries. This excluded publications that reported on proposed or planned digital system projects within the public sector of Southern African countries.

Context and challenges: publications that discuss the drawbacks, barriers, challenges, constraints, negative outcomes or limitations along with technical, cultural, organisational, or policy-related contextual factors.

Implementation analysis: publications which go beyond just the technical description and specifications to include analysis that unearths the implementation contextual considerations and outcomes.

The authors of this article applied the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram (Moher et al., 2009) (see Figure 1) to select the 17 publications. Screening was done to remove duplicates, reducing the final number of publications from 58 to 17. At the end of the screening process, which was done by two reviewers based on the abstracts and the titles, only 17 publications were included in the study. The second level of screening continued with the full-text evaluation of each of the 17 selected publications. The same two reviewers used for the first stage were involved in the full-text review. This time, the screening of the full text was done using the inclusion and exclusion criteria. Conflicting evaluations were discussed by the two reviewers, and a consensus was arrived at. After the evaluation, all 17 publications were selected for data extraction and synthesis for the study.

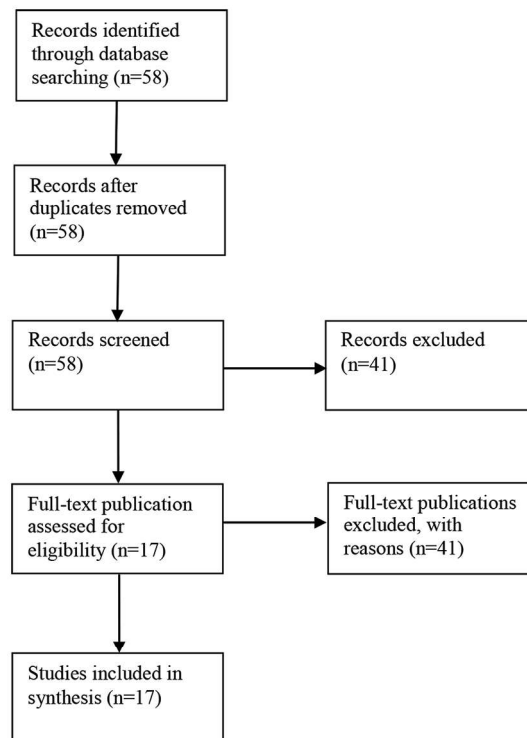


**Figure 1:** PRISMA 2009 Flow Diagram (Integrative Review)

Source: Authors' construction.

The analysis stage was undertaken in three steps. The two reviewers analysed the final 17 publications selected and extracted information that addressed the research questions set for the study. The results extracted from the 17 publications were used to answer the research question and

checked for consistency. Reliability and validity of the findings of the studies included were assessed using three different tools to test the quality of the publications. These tools are the Critical Appraisal Skills Program, Mixed Methods Appraisal Tools, and the Authority, Coverage, Objective, Data, Significance (AACODS) checklist. The quality of the qualitative studies was appraised using the Critical Appraisal Skills Program. Mixed Methods and qualitative studies were appraised using Mixed Methods Appraisal tools (Hong et al., 2018). Lastly, evaluation of the grey literature sources was done using the AACODS checklist (Tyndall, 2010). Though the scores of these tests are not reported in this article, the results aided in the interpretation and synthesis of the results of the studies (Tod, Booth & Smith, 2022), thereby ensuring that the findings of this article were informed by high-quality evidence.

Before we proceed further, we would like to note a few limitations. We used the Google Scholar, Scopus, ScienceDirect, Web of Science and Semantic Scholar databases, thus limiting the number of databases used for the study. The focus on the Southern African region led the study to ignore other relevant studies outside the regional block. The use of academic databases excluded other relevant sources such as mass media sources, reports from international organisations, NGOs, government officials, and other relevant sources which could provide ample and reliable sources of rich information to improve the quality of the study.

## Results

This section discusses the challenges that impede the smooth roll-out of digital systems in Southern African countries. To ease analysis and ensure that the analysis was well structured, the study was guided by the analytical framework (Figure 2), which groups the challenges under three captions: Technological, Organisational, and Environmental.

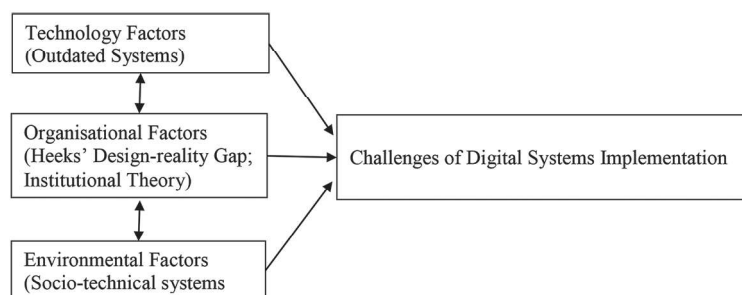


**Figure 2:** Analytical Framework for Analysing Digital System Implementation Challenges

Source: Adapted from Tornatzky and Fleischer (1990).

## External Environmental Obstacles

The public sector in Southern Africa works in silos and this entrenches excessive red tape (Komna & Mpungose, (2024 b). The environment is highly political, and with the presence of already stated red tape, approval processes continue to be delayed. Mbae et al. (2025) reported institutional silos in Botswana, as interoperability is lacking, coupled with an apparent lack of proper coordination among the various public departments, ministries, and parastatals. Another pertinent challenge identified by Mbae et al. (2025) is limited citizen participation and involvement in the roll-out of digital systems in Botswana's public sector. The authors argue that citizens are key stakeholders in any digital drive and must be involved in the process. As citizens are the beneficiaries of such public services delivered through the digital system, their involvement is considered key to the sustainability of such systems. The previous government of Botswana (Ex-president Masisi) specifically stated in his State of the Nation's Address that "citizens should be aware of digital services and the available channels of accessibility available to them (citizens) through a greater involvement in a democratic and transparent process" (Government of Botswana, 2023).

Bureaucratic procedures and institutional silos, where each government ministry operates independently from the others, were identified by the authors as an external resistance factor to the rolling out of digital systems in Botswana's Ministry of Agriculture. In addition, Komna and Mpungose (2024 a, b) identified bureaucratic procedures as a challenge to the adoption of digital service delivery in South Africa's public sector.

Related to the challenge of citizen participation in digital systems faced by the Botswana public sector (Mbae et al., 2025) is the issue of what is termed in this study as "organisational culture." Organisational culture refers to the change in the mindset of public sector workers towards embracing e-service delivery (Mothusi, 2008). In a similar manner, Almendingen et al. (2021) and Barrot et al. (2021) identified challenges like regulatory hurdles and high costs of digital systems as hampering effective digital transformation in the public sector. Likewise, Bjerke-Busch and Aspelund (2021) identified factors such as the lack of proper bureaucratic frameworks as a significant external challenge to the adoption of digital systems in public sector organisations including those in Southern Africa.

## Institutional Challenges

Institutional challenges from public organisations serve as a challenge in most African countries and this story is not different in the Southern African region. For example, Komna and Mpungose (2024, 2024 b) cited bureaucratic procedures in the public sector as a challenge to the adoption of digital service delivery in South Africa's public sector. Scholars reiterated

that such bureaucracy is deeply linked to the lack of support from the top management of such public organisations. To them top management in the Southern African region does not accept the adoption of digital systems as a priority in the delivery of public services to their citizens (Komna & Mpungose, 2024; 2024 b).

The lack of interest in the adoption of digital systems in the delivery of public services can also be linked to the lack of adequate digital skills of the public servants to use the most advanced digital tools and applications, and the fear of being kicked out of their job (Milukutu & Siachisa, 2023). This is because public servants see digital systems as a major competitor which has the potential of replacing them at the workplace and thus making the public servants redundant. Fear, from another dimension, was raised by Shava and Vyas-Doorgapersad (2022) in their concept of “digital hesitancy,” which they picked from Howlett (2012), where they contended that risk-averse behaviours in ministers in charge of public sector organisations prevent them from initiating digital system innovation due to fear of being judged on their abilities to innovate. Lack of adequate digital and computer skills also surfaced in Zambia’s healthcare sector (Milukutu & Siachisa, 2023). Furthermore, Milukutu and Siachisa (2023) found that resistance characterised digital transformation in Zambia’s healthcare sector. It is established that personnel in Southern Africa appear unprepared to adapt to changes in their organisations and keep pace with evolving digital transformation (Rakgoale et al., 2024).

Komna and Mpungose (2024 b) again pointed at financial constraints, use of outdated infrastructure, high costs to service digital systems, skills shortages, and constant leadership changes in the public sector as challenges to smooth digital transformation. Mbae et al. (2025) also identified the presence of challenges such as financial, lack of support and commitment from the top management, and limited digital skills and expertise in Botswana’s Ministry of Agriculture. Lack of support from the top management mostly emanates from the fear management expresses of being replaced and becoming redundant in the face of the rolling out of digital systems. Further, Shava and Vyas-Doorgapersad (2022) observed the challenge of no specific funding allocation devoted for digital systems in the local governments in Southern Africa. They further stated that the lack of funding in light of expensive digital infrastructure and software to support the operation of this digital infrastructure complicates the challenge. Shava and Vyas-Doorgapersad (2022) identified a lack of adequate digital skills and digital hesitancy as another challenge which impeded the adoption of digital systems in the local governments of South Africa.

### Technological Challenges

Technologically, digital transformation initiatives in the public sector of South Africa face challenges of cybersecurity threats (Komna & Mpungose, 2024). Understanding of new technology associated with digital systems, as well as reliance on legacy systems poses significant environmental challenges (Komna & Mpungose, 2024 b). Shava and Vyas-Doorgapersad (2022) report the presence of outdated digital technologies as a challenge to the smooth roll-out of digital systems. In addition, Mbae et al. (2025) identified factors such as poor ICT infrastructure, outdated computers which have not able to run modern digital system software, cybersecurity attacks and the use of inexperienced ICT project managers as significant technical challenges fighting against the roll-out of digital systems in Botswana's Ministry of Agriculture. Challenges from technology point of view were identified by Caliskan et al. (2021), and Depaoliet al. (2020). These authors talk about the presence of poor internet connectivity and inadequate infrastructure.

### The Digital Divide Conundrum

As a common challenge in most African countries, the presence of digital divide is experienced in Southern Africa's rural and urban areas making creating equity challenges in assessing public services. Komna and Mpungose (2024) support this claim as rural populace in South Africa are not able to access digital public services due to outdated digital infrastructure in rural areas, which causes access to such services to be very slow and in some instances, no access to such digital infrastructure making access to such services practically impossible for rural dwellers. Shava and Vyas-Doorgapersad (2022) also observed the presence of digital divide as a major challenge to local public service delivery by local governments in South Africa.

While mobile phones are prevalent throughout the continent, bandwidth is scarce and costs for internet access constitute a significant percentage of a user's income. Many people still rely on subsidised content, but subsidised data is often limited or not available in certain areas (Majama, 2018). Infrastructure and affordability therefore remain important issues on the agenda of Africa's digitalisation. Users protest the high costs under the hashtag #datamustfall on X/Twitter. The reality is also that most Africans have no access to the internet (Kiiza, 2018). Often, basic needs such as

shelter, food, health, and education trump interest in technology adoption. While there are concerns about basic social and economic supplies, as well as concerns about human rights abuses, the focus on digitalisation appears unreasonable to many (Majama, 2018). Moreover, with illiteracy persisting among indigenous populations in Africa, imported ICT systems cannot be used as intended, and people slowly adopt and appropriate ICT (Sègla, 2018). Even if users understand the language and can read and write, they may lack other skills, such as basic electronic data processing knowledge needed to independently use ICT. This is especially true for women and girls (Toffa, 2018).

In addition, Mbae et al. (2025) raised digital divide as a challenge in the rural areas of Botswana. The authors explained further by stating that most of the agricultural activities in Botswana, just like any other African countries, take place in the rural areas of Botswana. The services rendered by the Ministry of Agriculture benefits the rural dwellers more than the urban areas in Botswana, however with the presence of digital divide, coupled with challenges of expensive cost of data and slow internet speed make it difficult for rural dwellers in dire need of the services of the Ministry of Agriculture to bypass digital systems and use face to face services (manual processes). Further, there are concerns about limited internet infrastructure and poor internet connectivity in rural areas of southern Africa, which further worsens the challenge of digital divide (Mamba & Isabirye, 2015). Digital divide was also a challenge to Zambia's digital healthcare service delivery (Milukutu & Siachisa, 2023).

## Discussion and Conclusion

These results have brought to light diverse drawbacks to the smooth roll-out of digital systems in the public sector of southern African countries. The review has shown that these drawbacks are multifaceted. This means that a proper solution to these drawbacks requires a holistic approach which is grounded on proper accountability, skills development investment, and reforms aimed at restructuring the governance structure towards collaboration among the various ministries, departments, and agencies. It also requires adequate support from leadership. This section discusses the results and recommendations to improve digital transformation in the public sector of southern Africa.

To begin with, the review revealed that resistance to digital transformation, which stems from multifaceted factors, is a major drawback to digital systems in the public sector within the region. This revelation has been recognised by scholars including Piva (2018) and McKenna-Plumley et al. (2021) who argued that resistance hinders digital transformation initiatives in most developing countries. In support of this, Hess et al. (2016) argued

that incorporating digital systems into already established public institutions creates challenges of resistance. This is because public organisations prefer to work using manual systems instead of digital systems (Sibanda, 2019). In the best-case scenario, public sector organisations prefer to run digital systems side by side with manual systems instead of embracing digital systems fully. Though this occurrence is a risk mitigation strategy to save employees in the public sector from being fully replaced by digital systems (Sibanda, 2019), it finds validation in the socio-technical systems theory (Abbas & Michael, 2025; Mumford, 2006).

To deepen the discussion on institutional challenges to digital systems, Bjerke-Busch and Aspelund (2021) identified factors like inadequate digital skills, bureaucracy, and the presence of outdated infrastructure as inhibiting digital systems within the public sector in Southern African region. Financial challenges, resistance to change, slow adoption of new technology and organisational silos were also identified and discussed by Haug et al. (2024). Singler and Guenduez (2024) further explained the reason behind the bureaucratic and persistent financial constraints of public sector organisations, particularly in developing countries. They believed that the structural characteristics of the public sector, which is rooted in procedural adherence and rigid hierarchies make room for resistance to innovative change and for red tape, which seems to be a common thing in the public sector within the southern part of Africa. According to the institutional theory, resistance from institutions may occur through bureaucratic norms, organisational silos and fear due to job displacement by technology (Roszkowska-Menkes, 2023; Suddaby, 2013).

Resistance, as observed by us, is multifaceted in nature within digital transformation initiatives in Southern Africa. Addressing the different forms of resistance to digital transformation initiatives in the region, requires targeted change management strategies (Piva, 2018; McKenna-Plumley et al., 2021). However, Vial (2019) conceded that implementing these change management strategies is time-consuming. Moreover, Sibanda (2019) stated that outdated support structures hinder digital system implementation. Heavin and Power (2018) have supported calls for stakeholders to adopt modern support systems to manage digital systems in the public sector. They identified fear of job displacement and cultural inertia as challenges to digital transformation.

The theoretical framework and the review have shown that ensuring a successful digital transformation regime in the public sector of southern Africa requires an adequate understanding of both internal and external factors which affect digital systems. For instance, according to the Technology Acceptance Model, digital transformation will offer several benefits to Southern Africa's public sector including improved performance,

financial and time efficiency, and convenience (Odoom et al., 2024; Sharda et al., 1988). However, for the benefits to occur will depend on Southern Africa's public sector's acceptance and use of digital transformation information. Technological factors such as perceived usefulness of digital transformation, perceived ease of use of digital transformation, attitude, and behavioural intentions of public sector users of digital transformation will affect the success or otherwise of digital transformation (Davis, 1989; Odoom et al., 2024; Marikyan & Papagiannidis, 2023). From the review, technological drawbacks such as poor internet connectivity and inadequate digital infrastructure in southern Africa undermine the effectiveness of digital transformation in the public sector.

Research on the challenges to digital transformation raised concerns such as inadequate digital infrastructure, especially in rural areas of southern Africa, which acts as a hindrance to the use of digital services. Thus, investment in digital services, especially in rural areas of southern Africa with poor internet accessibility, will increase the use of digital services in the public sector. Similarly, from the socio-technical theory, it is clear that outdated digital technologies, poor ICT infrastructure, and cybersecurity attacks will impede digital transformation in southern Africa's public sector. Indeed, in Botswana digital drawbacks, including poor ICT infrastructure, outdated computers and cybersecurity attacks, undermine efficiency in the public sector (Mbae et al., 2025).

Similarly, organisational and environmental factors are crucial to the success or otherwise of digital transformation in the public sector of southern Africa. From the viewpoints of the institutional theory, resistance from public sector institutions including organisational structures, bureaucratic norms, institutional silos, fear for change management, fear associated with job displacement by technology, and unfavourable power dynamics will affect the adoption and impact of digital systems in the public sector of southern Africa. The impact of these organisational and environmental factors is compounded by wide disparities in digital access, as explained by the digital divide framework.

It is vital for stakeholders in southern Africa to institute reforms in the public sector for digital systems to thrive in the public sector, including the important of having dependable internet access to support digital transformation efforts (Sibanda, 2019). Equipping leadership with skills and adequate training (Kotter, 2021) is needed to drive digital initiatives and cultivate innovative culture.

To effectively handle resistance to digital system implementation in Southern Africa's public sector, continuous training and clear communication

are needed (Kotter, 2021). Reskilling and upskilling of public sector workers are key to make the public servant relevant in the face of such a transition from manual to fully digital systems. In this case, public sector workers will still be relevant in the face of digital transformation initiatives in the public sector. There is a need for Southern Africa to change its digital platforms to a user-friendly one and to modernise its digital infrastructure. Also important is the need for the region to change old computers that do not support the running of modern technology software.

This review demonstrates how technological, organisational, and environmental barriers interact in the Southern African region-specific ways that shape the implementation of digital systems in public sector. Digital transformation in Southern Africa is strongly conditioned by the coexistence of relatively advanced policy ambitions and uneven implementation capacity. Several countries in the region have adopted national digital transformation strategies, e-government programmes, smart city initiatives, and regional digital infrastructure agendas. However, these ambitions often exist alongside weak institutional coordination, fragmented implementation structures, limited technical capacity, and persistent reliance on manual administrative processes. This creates a pronounced design–reality gap in which digital policies are formally articulated, but the administrative, infrastructural, and human resource conditions required for effective implementation remain underdeveloped.

Further, deep spatial inequalities are seen in the Southern African region, which shape digital adoption in ways that are particularly significant for public service delivery. Rural–urban disparities in internet connectivity, digital literacy, affordability of data, and access to reliable infrastructure remain central obstacles. This is especially important because many public services in the region, including agriculture, health, social protection, land administration, and local government services, are heavily demanded by rural populations. Consequently, digital transformation initiatives risk excluding precisely those citizens who are most dependent on public services. In this respect, the digital divide in Southern Africa is not merely a technological access problem; it is a public administration and social equity problem.

The region's public sector digital transformation is shaped by historically entrenched bureaucratic systems and administrative silos. Many Southern African states inherited highly centralised administrative structures, which continue to influence contemporary governance arrangements. These structures often produce slow decision-making, duplication of digital platforms, poor interoperability, and limited interdepartmental collaboration. While bureaucratic resistance exists in many developing countries, the Southern African experience is distinctive because digital

transformation is frequently pursued within public institutions that remain procedurally rigid, hierarchical, and weakly integrated across ministries, departments, agencies, and local governments.

On the other hand, citizen participation in digital transformation remains relatively weak across the region. Many digital systems are designed and implemented through top-down administrative processes, with limited involvement of citizens, civil society organisations, frontline public servants, and local communities. This weakens system legitimacy, reduces usability, and contributes to low adoption. In Southern Africa, where public trust, service delivery protests, administrative responsiveness, and participatory governance remain important governance concerns, citizen-centred digitalisation is particularly important. Digital transformation must therefore move beyond efficiency-driven automation and become a mechanism for strengthening democratic participation, inclusion, and accountability.

Put together, these dynamics show that the Southern African context differs from the broader developing-country context through the specific interaction of ambitious digital policy agendas, uneven infrastructural capacity, spatial inequality, centralised bureaucratic traditions, fragmented institutional coordination, fiscal constraints, and limited citizen participation. The main analytical contribution of this review is therefore in its demonstration that digital transformation barriers in Southern Africa are not simply generic obstacles, but mutually reinforcing constraints embedded in the region's governance, administrative, and socio-economic realities. Addressing them requires context-sensitive reforms that integrate digital infrastructure investment with institutional restructuring, leadership development, intergovernmental coordination, and inclusive public participation.

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