Journal of Service Science and Management, 2025, 18(6), 500-520
https://www.scirp.org/journal/jssm
ISSN Online: 1940-9907
ISSN Print: 1940-9893

Assessing the Impact of Digital Transformation on Local Government Service Delivery in Rwanda: A Comprehensive Review

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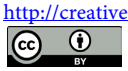
How to cite this paper: Bob, G., & Kebede, S. (2025). Assessing the Impact of Digital Transformation on Local Government Service Delivery in Rwanda: A Comprehensive Review. *Journal of Service Science and Management, 18,* 500-520.
https://doi.org/10.4236/jssm.2025.186031

Received: September 30, 2025
Accepted: November 30, 2025
Published: December 3, 2025



Abstract

In an era where digital transformation is vital for enhancing public services, stimulating economic growth, and ensuring societal resilience, governments are increasingly prioritizing the integration of digital technologies in public administration. This study examines the impact of digital transformation on service delivery in local government entities in Rwanda, a country striving to become a knowledge-based economy. The study addresses three critical questions: the effectiveness of digital transformation in service delivery, the strengths and weaknesses identified in these efforts, and actionable recommendations for improvement. Using a mixed-methods approach of regulatory document review, surveys, and stakeholder engagement, the study provides a comprehensive assessment of how digital technologies are reshaping governance practices and public service delivery in Rwanda. Over the years, Rwanda has made significant strides in digitalizing services at local Government entities. Despite these achievements, challenges remain in improving the digitalization of service delivery, such as a lack of digital infrastructure and inadequate training for officials and staff at local entities. Recently, the Ministry of Local Government in Rwanda conducted an assessment, and after reviewing several related documents and reports, the study suggests the following recommendations. These include enhancing digital Infrastructure, improving E-Government Platforms, increasing Capacity Building and Training, improving Citizen Engagement and Feedback Mechanisms, increasing collaboration with technology partners, and having a strong monitoring and evaluation system. As Rwanda continues its journey toward digital innovation, this study underscores the pivotal role of technology in promoting effective governance and improving the quality of life for its citizens.

Keywords

Local Governments, Digital Transformation, Service Delivery, Rwanda

1. Introduction

Governments are increasingly aware of the need to accelerate digital transformation to enhance public services, stimulate economic growth, and ensure societal resilience in the digital era. The integration of digital technologies in public administration has fundamentally changed how services are delivered, creating both challenges and opportunities. Digital technologies have enhanced public access to information and facilitated the rapid delivery of essential services (Mountasser & Abdellatif, 2023). Consequently, many governments have made Digital Transformation a priority to improve transparency, speed, accessibility, and efficiency, while also aiming to reduce corruption in the public sector (Milukutu & Siachisa, 2023).

The integration of digital tools and ICT in public administration has redefined how government entities operate and interact with each other and with citizens (Christensen & Lægreid, 2022). These technologies have transformed daily governance practices and influenced the work environment of civil servants. Public service delivery has experienced significant changes due to the incorporation of digital technologies. Over the past decade, there has been a notable increase in digital public service initiatives from both public and private sectors; approximately 400 such initiatives were reported globally by 2017 (Aker, 2017). This growth reflects a broader trend towards adopting digital technologies to enhance public service delivery.

Local governments in Rwanda are increasingly adopting digital solutions to improve service delivery, enhance efficiency, and promote transparency. This shift is vital in a nation focused on socio-economic growth, where effective governance and responsive public services are essential. Rwanda's ambition to become a knowledge-based economy is reflected in its national strategies, including Rwanda Vision 2050 and the National Strategy for Transformation (NST 1 and NST 2). These frameworks emphasize the role of digital technology in driving innovation and enhancing public service quality. As a result, local authorities are exploring various digital tools and platforms to streamline operations and engage citizens more effectively.

This study aims to assess the current state of digital transformation, identify key challenges, and recommend targeted strategies for improvement. Specifically, the study focuses on the assessment of the impact of digital transformation on service delivery by addressing three critical, yet underexplored, research questions:

1) How effective is digital transformation, and what is its impact on service delivery in local government entities in Rwanda?

2) What strengths and weaknesses have been identified in digital transfor-

mation efforts to enhance service delivery in Rwanda?

3) What actionable recommendations can be made to improve digital transformation and service delivery in local government entities in Rwanda?

By reviewing relevant reports, conducting surveys, and engaging with key stakeholders, the study seeks to provide a comprehensive understanding of how digital transformation is reshaping public services in Rwanda. Additionally, the study will contribute to existing knowledge by identifying best practices and lessons from local authorities that have successfully undergone digital transformation. As Rwanda strives to become a leader in digital innovation in Africa, the insights from this study will be valuable for policymakers, practitioners, and scholars, guiding the optimization of service delivery through digital means. Ultimately, this research will underscore the crucial role of technology in promoting effective governance and improving the quality of life for Rwandan citizens.

2. Literature Review

While a substantial body of literature exists on the digitalization of the public sector, scholars have identified inconsistencies and fragmentation in both conceptual and operational definitions of digitalization. These issues have hindered theoretical and empirical advancement. The lack of coherence underscores the pressing need for a comprehensive and unified framework to define and operationalize key terms, such as "digital transformation", "public service delivery", and "digital infrastructure", particularly in the context of Rwanda's distinct socio-political and economic environment.

2.1. Digital Transformation

Despite significant global interest in Digital Transformation, a precise, widely accepted definition remains elusive (Kraus et al., 2021). This lack of clear boundaries complicates efforts to define the concept rigorously. The digitalization of public services refers to the integration of data-driven methodologies, technology, and innovative approaches into traditional administrative frameworks and service delivery (Portion et al., 2023). Fischer et al. (2021) differentiate "digitalization" as the adoption of information and communication technologies (ICT) in public administration, while using "digital transformation" as a framework to illustrate the profound changes resulting from this process. Larsson and Teigland (2019) emphasize that both digitalization and digital transformation are critical for understanding the societal impacts of digital technology. These terms reflect a complex evolution of digital tools and processes that fundamentally change interactions among individuals, organizations, and governments.

By distinguishing between digitalization, which involves merely adopting digital technologies in existing processes, and digital transformation, which entails reimagining and restructuring activities to leverage these technologies for innovation and efficiency, scholars and practitioners can better navigate the ongoing digital revolution. This nuanced understanding is essential for maximizing the

benefits of the digital age, enabling societies to adapt to and shape their digital futures.

The importance of these terms in conveying the effects of digital technology on society is stressed. Digital transformation encompasses both technological advancements and their integration into the broader social system, influencing various societal elements and marking a shift from previous views on public sector digitalization.

To address the ongoing ambiguity in terminology within the digital government domain, this study adopts the following definition: "Digital transformation in public service delivery refers to the comprehensive reimagining, restructuring, and enhancement of government operations and services through the strategic integration of digital technologies. It aims to drive organizational change, improve efficiency and accessibility, enhance citizen engagement, and achieve better governance outcomes."

2.2. Digital Infrastructure

Scholars are increasingly focusing on digital technology and infrastructure issues. There are significant disparities in digital infrastructure and services across republics, within republics, and among different demographic groups within nations. These inequalities create substantial barriers to the effective utilization of new technologies for public service delivery, especially in developing countries where demand is most significant (Ojo & Millard, 2017). Economic literature consistently demonstrates a positive correlation between public services and economic development. Numerous studies have examined the impact of various public services, including infrastructure, education, and public safety, revealing that they can have a positive influence on economic development in specific contexts. Among these, transportation and infrastructure services show the strongest positive relationship with economic growth (Aker, 2017).

In modern economies, the importance of digital infrastructure comprising broadband networks, digital platforms, and data analytics is increasingly vital. It enhances the efficiency of traditional public services and acts as a catalyst for innovation and economic growth. Digital infrastructure is a foundational pillar essential for advancing digital transformation in the public sector. It enables equitable participation across all segments of the population in labor markets, wealth generation, and the benefits of economic progress (Ndubuisi et al., 2021). Advantages of digital infrastructure include cost-effectiveness, high efficiency, extensive coverage, and greater inclusivity compared to traditional infrastructure.

Digital infrastructure includes the physical and virtual components that underlie modern information and communication technology (ICT) systems. This encompasses hardware, such as servers, routers, and cables, as well as software applications, platforms, and networks that support the storage, processing, and transmission of digital data. It is crucial for facilitating digital transformation initiatives, enabling organizations and governments to leverage technology for en-

hanced efficiency, innovation, and service delivery.

2.3. E-Government

In the context of digitalization and information and communication technologies (ICT), the term "e-government" is often used interchangeably with other concepts, leading to ambiguity (Christensen & Lægreid, 2022). Central to the study of digitalisation in the public sector, e-government is recognised as a significant reform aimed at improving the efficiency and responsiveness of government services. However, its definitions and applications vary widely, focusing more on outcomes than on the specific technologies used to achieve them. As a result, e-government has become a focal point for extensive research across various contexts (Edelenbos et al., 2021).

E-government, a component of e-governance, represents the technological aspect of governmental operations, ensuring public access to information and services. It enhances interactions between the government and stakeholders, promoting accountability, efficiency, and effectiveness, and serves as a foundation for e-democracy (Mensah & Adams, 2020). According to Terlizzi (2021), e-government is defined as "the process of digitally connecting citizens to their government, enabling access to information and services provided by government agencies." Christensen & Lægreid (2022) argue that e-government primarily focuses on the internal operations of government and the inter-agency delivery of services, often employing digital tools for information dissemination and management. Conversely, e-governance emphasizes broader interactions between government, citizens, and other societal stakeholders, leveraging ICTs to enhance transparency, participation, and collaboration in addressing societal challenges.

E-government initiatives are crucial for driving digital transformation in public service delivery, leveraging digital technologies to enhance efficiency, accessibility, and transparency. E-government encompasses the use of digital tools such as the Internet and mobile devices to deliver government services, share information, and facilitate interactions with citizens, businesses, and other entities. By providing convenient online access to services and information, e-government aims to enhance citizen engagement and satisfaction while streamlining government processes.

However, the definition of e-government is not universally accepted, as it spans multiple fields, including public administration and information systems. The effective delivery of public services through e-government does not guarantee acceptance by citizens. The success of e-government initiatives heavily relies on public acceptance and adoption (Mensah & Adams, 2020). Susanto et al. (2013) emphasizes that understanding the factors influencing e-government acceptance from the citizens' perspective is essential for developing widely adopted, citizen-centric services. Such services prioritise addressing citizens' concerns (Mensah & Adams, 2020).

The global attention on e-government adoption and implementation stems

from its numerous benefits, including easier access to public information, improved service delivery, increased transparency and accountability, and enhanced efficiency of government operations. The implementation of e-government involves various stakeholders, resulting in distinct types of interactions: Government-to-Government (G2G), Government-to-Business (G2B), Government-to-Citizen (G2C), and Government-to-Non-Profit (G2N). Each of these interactions plays a crucial role in enhancing government services and engagement with different sectors of society.

2.4. Public Service Delivery

The effective transformation of public service delivery relies on organizations with clear policies, strong leadership, skilled personnel, and active citizen engagement. By utilizing transparent and relevant ICT services, public agencies can rebuild trust and offer innovative ways for citizens to interact with government at all levels (Milakovich, 2021). According to Kalonda & Govender (2021), service delivery consists of localized actions by agents in public agencies or private enterprises aimed at providing citizens with essential products and services that meet established standards. This process involves collective interactions among policymakers, service providers, and citizens, covering various services and their operational systems, including social services (health and education), infrastructure (electricity, roads, and water), and citizen security (police and justice), which typically fall under state responsibilities (Elayah et al., 2024).

Digital Public Service Delivery (DPSD) refers to the utilization of digital technologies to design, process, and deliver services, thereby enhancing effectiveness and efficiency (Adeola et al., 2022). Public service delivery refers to the manner in which government institutions and agencies provide essential services to citizens, businesses, and other stakeholders across a wide range of sectors, including healthcare, education, infrastructure development, public safety, and social welfare. The modern governance approach has redefined service delivery to align more closely with local community needs, recognizing citizens as key participants in the production process and giving them greater responsibility in delivering public services (Elayah et al., 2024).

Effective public service delivery is crucial for the well-being of society and economic development. It entails the equitable distribution of resources, implementation of policies that address the population's needs, and the establishment of mechanisms for citizen engagement and feedback. The primary goal of digital transformation in the public sector is to enhance service delivery by improving efficiency, transparency, accountability, and citizen engagement.

2.5. Impact of Digital Transformation on Public Service Delivery

Digital transformation is fundamentally changing the way public services are delivered and public sector institutions operate globally. It presents new opportunities to improve efficiency, transparency, and citizen engagement.

Rwanda is recognized as a leader in National ID system development across Africa. In the late 2000s, the government introduced a modern ID system, issuing national ID cards starting in 2008. Concurrently, the technology sector was rapidly expanding, contributing to a robust digitalization effort, which culminated in the launch of Irembo, a public-facing data exchange system, in 2015.

Irembo was created to enhance data access and management within the government, thereby improving service delivery. The name "Irembo", meaning "gateway" in Kinyarwanda, refers to its role as a citizen e-portal for public services. It is accessible via website, mobile app, and USSD for feature phones, and operates as a public-private partnership, distinct from government operations, while still involving significant government investment. Today, Irembo facilitates digital workflows, service delivery, payments, and operations for over 100 services across 20 government institutions, covering areas such as family affairs, immigration, health, and education. The platform has processed over 25 million applications, generating $300 million in revenue, and has saved more than 100 million working hours by reducing paperwork. Users benefit from expedited service delivery, with processing times cut from 5 days to just 24 hours. To promote inclusion, over 7000 agents nationwide assist people in rural areas.

Irembo's success is primarily attributed to Rwanda's progressive policies, which support the country's national digital transformation. In the early 2000s, the government launched "Vision 2020", an economic blueprint aimed at achieving middle-income status within 20 years. This initiative was followed by two Economic Development and Poverty Reduction Strategies (2007-2012 and 2013-2018), both of which emphasized ICT as vital for socio-economic growth. Supporting these strategies were the National Information and Communications Infrastructure Plans (NICI). NICI 1 (2000-2005) focused on establishing legal frameworks for telecommunications liberalization. NICI 2 (2006-2010) aimed to accelerate the rollout of infrastructure and expand network coverage, while NICI 3 (2011-2015) sought to extend connectivity benefits to citizens and businesses. It was during this period that Irembo, initially named Rwanda Online, was launched. The Smart Rwanda Masterplan 2020 was also inaugurated in 2015, outlining a long-term strategy to evolve Rwanda into a digital economy and society, aiming for a comprehensive knowledge-based economy.

Rwanda has made significant strides in digitalizing public services to enhance accessibility and efficiency. Here are some key public services that have been digitalized (Table 1):

- **E-Government Portal**: The Rwanda Online Platform provides access to various government services, including business registration, tax payments, and civil registration.
- **National Identification System**: The use of biometric ID cards facilitates easier access to services and helps in the identification of citizens.
- **Digital Health Services**: The Rwanda Health Management Information System (RHMIS) allows for the tracking of health data, while telemedicine services have expanded access to healthcare.

Table 1. Key service available through IREMBO.

No.	Type of service	Description
1	Family	▪ Certificate for Widow/Widower ▪ Certificate of Residence ▪ Certificate of Genocide Survivors ▪ Certificate of Being Single ▪ Child Recognition Record ▪ Guardianship Record ▪ Certificate of Succession ▪ Certificate of Cohabitation ▪ Birth Services—This may include birth certificates or birth records ▪ Marriage Services ▪ Death Services ▪ Adoption Record
2	Identification Services	▪ Application for National ID Correction ▪ Application for National ID ▪ Registration in the National Population Registry ▪ National ID Replacement ▪ Certificate for Replacement of National Identification ▪ Certificate of Full Identity ▪ Change of name ▪ Certificate of Nationality ▪ Certificate of Divorce ▪ Certificate of Being Alive
3	Land Services	▪ Sporadic Registration ▪ E-payment Services ▪ Authentication of Loan Agreement ▪ Change of Land Use ▪ Title Details Update ▪ Document Replacement ▪ Title Transfer ▪ Land Merging ▪ Subdivision
5	Health Services	▪ Health insurance registration (Mutuelle de Santé)
7	Business Services	▪ Business registration ▪ Tax clearance certificates
8	Notarisation and Gazette Services	▪ Publish in the Official Gazette ▪ Subscribe to the Official Gazette ▪ Purchase for an Official Gazette ▪ Notary services

Source: (IREMBO, 2025).

- **E-Taxation**: The Rwanda Revenue Authority offers online tax filing and payment systems, simplifying the process for businesses and individuals.
- **Land Registration**: The Land Administration and Management System

(LAMS) allows for online land registration and management, improving transparency and efficiency.

- **Public Procurement**: The Rwanda Public Procurement Authority has digitalized procurement processes, enabling suppliers to bid for government contracts online.
- **Education Services**: The Ministry of Education has implemented online systems for student registration and management of examination results.
- **Social Protection Programs**: Digital platforms facilitate the distribution of social protection payments and services to vulnerable populations.
- **Transport Services**: The Rwanda Transport Development Agency offers online vehicle registration and licensing services.
- **Citizen Feedback Mechanisms**: Platforms like "Umushyikirano" allow citizens to provide feedback on government services and initiatives through digital means.

This study highlights several benefits of digital technologies, including increased transparency and accountability, enhanced efficiency and speed of service, reduced service costs, improved accessibility and inclusivity, greater citizen engagement, and innovation in service delivery. However, it also addresses significant challenges, such as low digital literacy and limited institutional capacity.

3. Methodology

3.1. Sample and Sampling Techniques

The study utilized a stratified multi-stage (cluster) probability sampling design to ensure representativeness across Rwanda's diverse administrative and geographical contexts, organized into 13 strata corresponding to 12 Districts (three from each province) and the City of Kigali, treated as a separate stratum due to its unique urban governance structure. The sampling frame was based on household data from the 5th Rwanda Population and Housing Census (2022), provided by the National Institute of Statistics of Rwanda (NISR), encompassing 3,312,743 households spread across 14,837 villages, 2148 Cells, 416 Sectors, 30 Districts, 4 Provinces, and the City of Kigali. To determine the required sample size, the study adopted a formula used by the Rwanda Governance Board (RGB) for the elaboration of Citizen Report Cards (CRCs), which considers the proportion of satisfaction with delivery services, using a baseline satisfaction proportion of 76.5% reported in CRC 2024 for sample calculation.

$$n = Z^2pqN/(e^2(N-1) + Z^2pq)$$

where:

n = the sample size.

N = The total number of households in the whole country.

Z = 1.95 for the confidence interval of 95%.

e = the desired level of precision (i.e. the margin of error).

P = proportion of the population which has the attribute in question ($q = 1p$; population not having that attribute).

For P being 76.5% or 0.765, q is therefore equal to 1 − 0.765 = 0.235, e = 0.02, N = 1726. Spreading them over 117 Cells covered by the survey, they generated 15 households by Cell and were randomly chosen as follows: 6 male-headed, 4 female-headed, 4 youth-headed or represented (gender respected), 1 headed/represented by a person with disability if any.

The survey covered a total of 12 districts and the City of Kigali, selecting 39 sectors (3 per district), 117 cells (3 per sector), and involved 1750 households, with each household providing one respondent for a total of 1750 individuals interviewed.

3.2. Data Collection and Analysis

A review of relevant regulatory, policy, and program documents from various ministries and agencies, such as the Rwanda Information Society Agency (RISA), the Ministry of ICT and Innovation (MINICT), the National ID Agency (NIDA), and IREMBO, was conducted. This included analyzing administrative data and resources from appropriate websites, electronic databases, and web-based libraries. Additionally, conventional literature and publications related to Digital transformation and service Delivery were examined to provide a comprehensive background.

Key Informant Interviews (KIs) were conducted with selected individuals at national and local levels, including current and former leaders, policymakers, senior technocrats, researchers, and independent analysts. Focus-group discussions (FGDs) took place at the cell, Sector, and district levels, involving ordinary citizens, members of local governments, and specific councils, such as those representing women, youth, and individuals with disabilities, as well as representatives from civil society organizations. Furthermore, A structured questionnaire was distributed to ordinary citizens, specifically targeting household heads and youth representatives, to assess the impact of digital transformation on local government service Delivery.

The collected data underwent a thorough cleaning process to eliminate inconsistencies, errors, and incomplete entries, ensuring reliability and accuracy. Once cleaned, the data were systematically processed and organized for analysis using appropriate qualitative and quantitative methods. The analysis aimed to extract meaningful insights aligned with the study objectives, highlighting trends, patterns, and key findings.

3.3. Scope and Limitations

This study surveyed 12 districts across four provinces and Kigali city. Within each district, three sectors were chosen, and within each sector, three cells were randomly selected, totaling 117 cells. Data collection faced challenges as many participants could not attend Focus Group Discussions (FGDs) due to overlapping responsibilities. Scheduling FGDs was complicated by the busy schedules of local officials and competing priorities at various levels.

4. Findings and Discussions

4.1. The Effectiveness of the Local Government Structure on Service Delivery

Following the adoption of decentralisation in 2000, the Government of Rwanda undertook a comprehensive territorial administrative reform aimed at bringing service delivery closer to citizens. It is not just a service delivery; rather, the quality of service delivery is key to building citizens' confidence in public offices, attracting investors, and encouraging spending. The quality-of-service delivery is an ultimate responsibility of the government and private sector, emphasizing accountability and transparency, responsiveness and fairness, as well as participation and inclusion across all sectors.

This reform focused on strengthening local government entities, streamlining administrative structures, and eliminating inefficiencies. The reform aimed to reduce duplication, clarify institutional roles, and enhance cost-effectiveness in public service provision by consolidating overlapping entities, including provinces, districts, and sectors. The following Table 2 indicates the territorial administration reforms conducted in Rwanda from 2001 to the present.

Table 2. Territorial administration and Institutional reforms.

Before 2001	2001-2006	Since 2006
12 prefectures	11 Provinces + Kigali City	4 Provinces + Kigali City
154 communes	106 Districts	30 Districts
1531 Sectors	1545 Sectors	416 Sectors
8987 Cells	9165 Cells	2148 Cells
		14,837 Villages (Imidugudu)

Source: (MINALOC Survey, 2025).

The Local Government structure is organised in a hierarchical, decentralized system designed to bring services closer to citizens and promote participatory governance. Each organ is governed by a Council (elected or nominated) and has a technical team to implement government policies and programmes.

Regarding the resolutions of the Cabinet in its session of July 29th, 2014, regarding the approval of a new organizational structure, salaries, and fringe benefits for employees in High Institutions, Ministries, and Public Institutions.

The rural and urban Districts' organisational structure model has been approved and was submitted to the district. It encompasses the following staff (Table 3):

Table 3. Local government staff distribution.

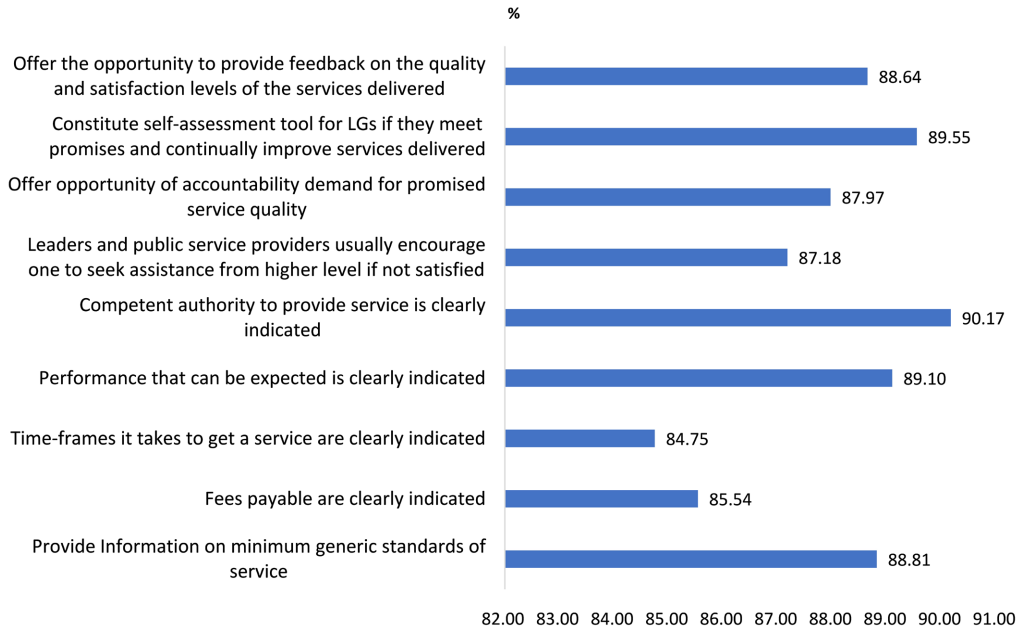
Category	Number of staff				
	CoK	District	Sector	Cell	Total
Rural		85	15	2	102
Urban		96	17	2	115
CoK	213	69	18	2	302

Source: (MINALOC, 2025).

According to Presidential Order N˚. 001/01 of 06/02/2023 concerning Sectors, Cells, and Villages, the Sector is responsible for implementing development programs, while the Cell is tasked with providing basic services, collecting numerical data, and promoting community participation in sustainable development activities. However, these expanded responsibilities have not yet been matched by adjustments in local government organizational structures or staffing levels. Currently, there is an average ratio of 1 staff member at the Cell level to 1.6 staff members at the Sector level, highlighting gaps in functional linkages between central and local governments. Therefore, it is essential to revise the organizational structure and continue investing in human resource development for local government officials to enhance service delivery efficiency.

4.2. Services Charters Openly Communicated and Publicly Displayed

Service charters provide more information and indications that enable citizens to know about different public services. Figure 1 below offers additional support for this.



Source: (MINALOC Survey, 2025).

Figure 1. Roles of service charters.

Citizens appreciate how service charters provide information related to their expectations and needs. Mostly, the competent authority to deliver services is indicated (90.17%), as well as how service providers can assess their performance in meeting their promises to serve people and related outcomes (89.55%). They also indicate minimum requirements and time frames for expected services (84.75%). It was also possible to clearly distinguish their modes of delivery (online, face-to-face) in a public space for every citizen and available at the Cell level.

A large number of respondents (88.8%) appreciated the use of service charters because they provide necessary information and orientation on the most requested services by citizens.

4.3. Digitalization as a Governance Enabler

Rwanda has embraced digitalization as a key strategy to enhance governance and improve citizen services. This initiative is central to the country's decentralization efforts, promoting transparency, enhancing efficiency, and expanding access to public services.

The "Zero Paper, Zero Trip" principle aims to eliminate the need for physical documents and office visits by digitizing government services. Platforms like Irembo have transformed service delivery, allowing citizens to apply for services such as marriage certificates and birth registrations completely online. This shift has improved convenience, reduced bureaucratic delays, and bolstered public trust in the administration (MINALOC Survey, 2025).

Digitalization has also enhanced transparency in public procurement. The Umucyo e-Procurement system allows local governments to manage procurement processes online, making tendering and contract awards more transparent and competitive, thereby reducing corruption. Citizens, businesses, and oversight institutions can now monitor government spending in real-time, from tender announcements to contract execution.

These advancements highlight Rwanda's progressive governance approach, with digitalization serving as a cornerstone of effective decentralization. By integrating ICT tools into its governance structures, Rwanda ensures that decentralized entities deliver timely, transparent, and responsive services in a rapidly evolving digital landscape.

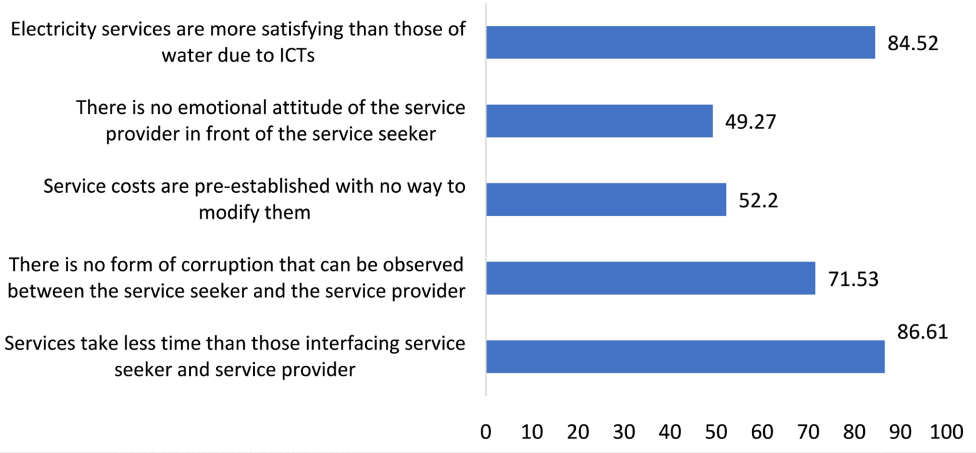
Additionally, Rwanda has utilized ICT to improve service delivery for its citizens abroad. The Rwanda Community Abroad Management Information System (RCA-MIS), developed in 2023, provides Rwandans living overseas with access to vital information and services (MINECOFIN, 2024). This platform enhances communication and support for the diaspora, streamlining member registration through a self-registration portal and a consular card request process.

4.4. The Effectiveness and Impact of Using ICT to Enhance Service Delivery

The question aimed to highlight the differences between traditional service delivery methods and those utilising ICT, to identify the resulting benefits (**Figure 2**).

The modernisation of service delivery using ICTs has improved multiple factors considered critical in service delivery, including reduced time compared to services that interface between seekers and service providers (86.61%), as well as reduced forms of corruption (71.53%). The comparison of utilities like electricity and water in service delivery indicated that electricity services are more satisfying than those of water, due to the actual use of ICT in electricity (buy as you use).

The results on services being cheaper or reliable remain mixed.



Source: (MINALOC Survey, 2025).

Figure 2. Service delivery modernised with the use of Information and communication technologies (ICTs) in LGs.

Technological advancements and digital transformation have been integrated to improve public financial management (PFM):

1) Transparency and Accountability: Integration of banking systems with IFMIS (Integrated Financial Management Information System) and e-banking platforms has promoted cashless transactions, reduced leakages, and improved traceability.

2) Process Automation: Tools like the NBAS (New Budgeting and Accounting System) have enabled automation of financial reporting and performance monitoring.

3) Integrated Education Payments: The School Data Management System (SDMS) is linked with IFMIS, Umwalimu SACCO, and telecom companies (MTN & Airtel) to track salaries, payments, receivables, and payables efficiently; enhancing audit readiness and minimizing costs related to physical paperwork and bank visits.

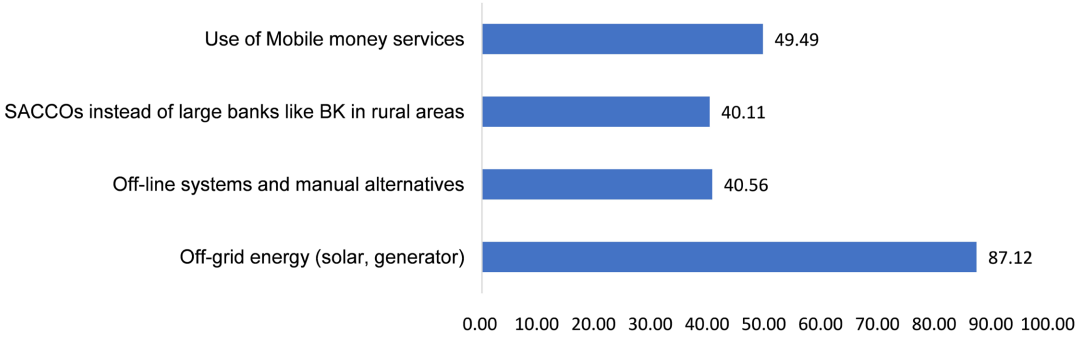
4) Most of its services can be paid at Sector offices using Irembo technology (Center of service delivery as per law), through community structures like Umurenge SACCO using MobiCash technology, or with private operators like Irembo agents (Technology), Mobicash Agent (Technology); or individually through "Byikorere-Self-applications" using a mobile phone by dialling *909# and following instructions.

4.5. Alternatives to Energy, ICT Infrastructures, and Service Intermediaries

In Rwanda's push toward inclusive and decentralised development, access to energy, ICT, and essential services remains a critical challenge, especially in remote and underserved areas. To bridge this gap and promote equity, the government

and development partners have introduced several alternative approaches to deliver energy, digital connectivity, and intermediary services through innovative, low-cost, and decentralised models.

In many rural areas, the absence of critical infrastructure significantly hinders the effective delivery of public services. Basic amenities, such as a reliable energy supply, ICT connectivity, and administrative presence, were either inadequate or entirely lacking, making it difficult for remote populations to access government services. This situation necessitated the development and adoption of alternative solutions, including off-grid energy systems, decentralized ICT platforms, and community-based service intermediaries, to ensure that essential services could continue to be delivered equitably and sustainably across all provinces (Figure 3).



Source: (MINALOC Survey, 2025).

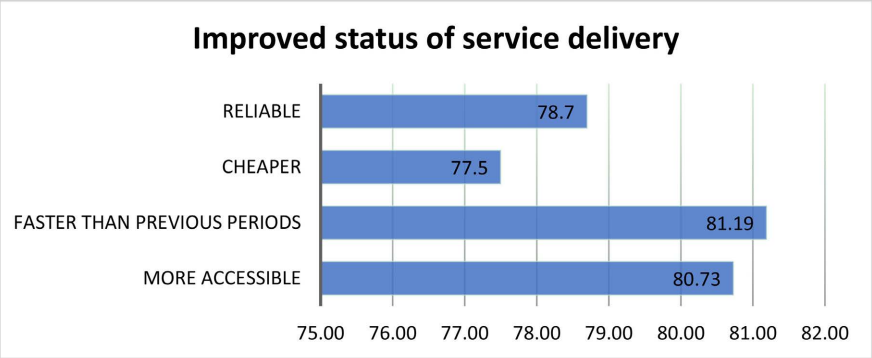
Figure 3. Alternative solutions to energy.

According to the MINALOC Survey, 2025, 87.12% of respondents indicated that off-grid energy (Solar and generator) was a more preferred alternative to other energy alternatives. From the above Table 3, the most significant gap was in electricity, where off-grid energy sources (solar, generator) are proposed. Offline and manual alternatives are proposed when online services are unavailable, while SACCOs and mobile money services can serve as alternatives to traditional banks for payment services. The percentage of respondents in these cases does not matter because only those who are facing the issues responded.

Innovative alternatives to energy, ICT, and service delivery have transformed Rwanda's local development landscape. They have proven essential in bridging gaps left by conventional infrastructure, enhancing service equity, and empowering local governance. Scaling up these solutions in a coordinated, inclusive, and sustainable manner will be key to unlocking socio-economic transformation across all Districts.

4.6. Improved Status of Service Delivery

Citizens compared the accessibility and speed of the service, as well as its status of being cheaper or more reliable. The following Figure 4 provides the results of the appreciation:



Source: (MINALOC Survey, 2025).

Figure 4. Improved status of service delivery.

1) Increase Efficiency and Speed of Services

The Rwandan local government significantly enhanced efficiency and speed in service delivery, achieving a rate of 81.9% (MINALOC, 2025) by adopting automated processes. Digital tools have streamlined operational workflows by automating routine administrative tasks, thereby reducing reliance on traditional paperwork and minimizing the potential for human error.

Online platforms are transforming the way citizens access essential services, such as permits and licenses. Rather than navigating cumbersome processes that often involved in-person visits and extensive paperwork, individuals could now complete applications and transactions in real time online. This shift resulted in significantly reduced waiting times and heightened customer satisfaction, creating a more responsive service environment. Furthermore, users benefited from the transparency of being able to track the status of their applications online, providing them with reassurance and the ability to follow up on their requests efficiently.

2) Increase Accessibility and Inclusivity

Online portals have played a crucial role in enhancing citizens' access to government services, with a rate of 80.73% (MINALOC, 2025), which represents a significant improvement compared to the period before 2000. A digital alternative to in-person visits, eliminating travel barriers and allowing individuals to access services conveniently from home at any time. This accessibility fostered autonomy and empowerment among users.

The rise of mobile applications further revolutionized access to government services. With smartphones widely used across the country, these apps provided a user-friendly interface for on-the-go access, promoting greater engagement through features such as push notifications and real-time communication with government departments. This significantly enhanced efficiency and responsiveness.

Integrating online portals and mobile apps helped create an inclusive environment, ensuring equitable access to resources for all citizens. This digital approach empowered individuals, strengthened community ties, and encouraged civic participation. As technology evolved, maintaining accessibility was crucial for diverse

populations to navigate government services effectively, thereby enhancing the effectiveness of public services and promoting citizen engagement in Rwanda.

3) Transparency and Accountability

The achievements in service delivery resulting from digital transformation have emphasized transparency and accountability (reliability) as fundamental pillars of effective governance and citizen engagement. Open data initiatives played a crucial role, 78.7% (MINALOC, 2025), by making government datasets freely accessible to the public. This practice fostered informed decision-making among citizens, enhancing trust in the government by reducing the potential for corruption and misuse of resources. Moreover, open data encouraged collaboration among government entities, the private sector, and civil society, leading to innovative solutions for public challenges and improved societal outcomes.

Tracking systems further amplified transparency and accountability by providing digital tools that allowed citizens to monitor the status of their applications for permits, licenses, or social services. These systems increased accountability by providing real-time updates, thereby holding public officials accountable for their timelines and decisions. They empowered citizens by reducing uncertainty and frustration in bureaucratic processes, allowing individuals to take an active role in tracking their requests. Additionally, many tracking systems included feedback mechanisms, which facilitated continuous improvement in public services and reinforced the accountability of government operations.

4) Cost Reduction

According to the MINALOC, Survey 2025, the cost of services provided by the Local government is 77.5% cheaper. Traditional service delivery methods in Rwanda often came with high expenses; however, technology streamlined these operations, reducing reliance on manual labor and decreasing the likelihood of human error. For instance, automated systems managed routine tasks such as billing and customer inquiries, which not only cut labor costs but also allowed staff to concentrate on more strategic initiatives. Furthermore, the transition to online services reduced the need for extensive physical infrastructure, resulting in additional savings.

4.7. Improve Citizen Engagement

Digital channels played a crucial role in facilitating feedback from citizens, significantly enhancing the responsiveness of local governments and organizations to community needs. By employing platforms such as social media, online, and dedicated feedback portals, authorities gathered real-time insights and opinions from residents. This immediate and accessible feedback loop enabled quicker adjustments to policies and services, ensuring that the community's voices were heard and taken into consideration. Moreover, the use of analytics tools helped identify trends and areas requiring attention, fostering a more dynamic and responsive governance approach.

Online platforms allowed more citizens to participate, regardless of geograph-

ical constraints or mobility issues. By incorporating this tool, local governments ensured that a wider array of perspectives was represented, leading to more informed and democratic decisions. Additionally, these methods enhanced transparency and trust between citizens and their representatives.

5. Discussions

5.1. Low Digital Literacy, Inadequate Infrastructure Coverage, and Limited Digital Capabilities of Local Governments

Low digital literacy, inadequate infrastructure, and limited digital capabilities among local governments are major obstacles to expanding digital service delivery. Key infrastructure issues include unreliable electricity, high internet costs, and insufficient coverage of basic ICT services in some areas. Furthermore, only 31.5% of the population aged 15 and older is digitally literate, which hampers efforts to achieve universal access to services. Local governments, especially at the cell level, struggle to provide comprehensive digital services due to these constraints.

Despite a high mobile phone penetration rate of 95.3%, low digital literacy (31.5%), and minimal smartphone usage (estimated at 15%) present significant obstacles to accessing digital services. However, high satisfaction rates among users were attributed to several key factors: those with access to digital services often experience substantial benefits, resulting in positive feedback that reflects broader experiences. Additionally, the services available are tailored to meet the needs of more digitally literate individuals, fostering a perception of efficiency and effectiveness. Local governments have also implemented targeted outreach and support initiatives to enhance user experience. Therefore, while the overall digital landscape faces considerable obstacles, these pockets of success and user satisfaction underscore the potential for improvement and the need for continued investment in digital literacy and infrastructure.

5.2. Lack of Training for Local Officials and Staff on New Technologies

The absence of comprehensive training programs for local officials and staff on emerging technologies significantly obstructs the advancement of service delivery through digitalization. In an era where digital tools can enhance efficiency, transparency, and accessibility, failing to equip personnel with the necessary skills creates a substantial gap. This gap not only affects the implementation of new systems but also limits the potential benefits that digitalization can offer. When officials are not adequately trained, they may struggle to utilize new technologies effectively, leading to resistance, errors, and ultimately, a decline in the quality of services provided to the community.

Moreover, this lack of training perpetuates a cycle of inefficiency and frustration within local governments. When staff members feel ill-equipped to handle digital tools, their confidence and motivation diminish, resulting in a workforce

that is less engaged and less likely to embrace innovation. This situation hinders the overall progress of local governance, as the intended advantages of digital transformation, such as streamlined processes, improved communication, and enhanced data management, are not fully realized. Therefore, investing in targeted training initiatives is crucial for empowering local officials and staff, fostering a culture of continuous learning, and ultimately improving service delivery to better meet the needs of the communities they serve.

5.3. Summary of Key Findings

Digitalization has played a pivotal role in reshaping service delivery, exemplified by platforms like Irembo that facilitate online applications, thereby minimizing bureaucratic hurdles and enhancing procurement transparency. The integration of Information and Communication Technology (ICT) has significantly improved both the efficiency and accessibility of services, with reported improvements of 81.9% and 80.73% respectively. Despite the promising advancements in service delivery frameworks, several challenges undermine their effectiveness. A significant barrier is the low level of digital literacy, with only 31.5% of the population proficient in digital skills. Furthermore, infrastructure challenges, including unreliable electricity supply and high internet costs, particularly affect rural communities, limiting their access to essential services. Additionally, training deficiencies among local officials hinder the effective use of emerging technologies, resulting in sustained inefficiencies and subpar service quality.

To overcome these obstacles, targeted measures are essential. Firstly, investing in digital literacy programs is crucial to empower the population and expand service access. By enhancing digital skills among citizens, the potential for utilizing online services can be maximized. Secondly, infrastructure development must be prioritized, focusing on improving electricity reliability and expanding internet coverage to ensure equitable access to services. Finally, implementing comprehensive training initiatives for local officials on new technologies will enhance their capability to leverage digital tools effectively, ultimately improving service delivery outcomes.

6. Conclusion

Digital transformation has emerged as a pivotal opportunity for enhancing service delivery in local authorities across Rwanda. By adopting advanced technologies, local governments have streamlined their operations, improved communication with citizens, and delivered services more efficiently. This shift not only led to better resource management and transparency but also increased community access to information, fostering a more engaged citizenry. Despite these promising advancements, several challenges hindered the full realization of digital initiatives. The existing technological infrastructure is inadequate, necessitating significant investments in reliable internet connectivity to create a solid foundation for digital transformation. Additionally, staff training became essential, as local authority

personnel needed to develop both technical skills and a comprehensive understanding of how to effectively incorporate new technologies into their daily operations.

7. Recommendations

- **Enhance Digital Infrastructure:** Invest in broadband connectivity for reliable access in all areas and utilize cloud computing to improve data storage and information sharing among local entities.
- **Implement E-Government Platforms:** Develop user-friendly online service portals and mobile applications to facilitate access to government services, issue reporting, and information retrieval for citizens.
- **Improve Capacity Building and Training:** Enhance skills through digital literacy programs for public servants and citizens, along with workshops and seminars to share best practices in digital service delivery.
- **Increase Citizen Engagement and Feedback Mechanisms:** Utilize surveys and polls for continuous citizen feedback on public services and adopt participatory approaches to involve citizens in decision-making for digital service implementation.
- **Increase Collaboration with Technology Partners**: Engage in public-private partnerships with tech companies and establish innovation hubs to enhance digital initiatives through collaboration with startups, government, and academia.
- **Create a Strong Monitoring and Evaluation system**: Establish clear key performance indicators (KPIs) for digital transformation effectiveness and continuously adapt strategies using performance data and citizen feedback.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Adeola, O., Edeh, J. N., Hinson, R. E., & Netswera, F. (2022). *Digital Service Delivery in Africa: Platforms and Practices.* Springer Nature.

Aker, J. C. (2017). Using Digital Technology for Public Service Provision in Developing Countries. In S. Gupta, M. Keen, A. Shah, & G. Verdier (Eds.), *Digital Revolutions in Public Finance* (p. 201).

Christensen, T., & Lægreid, P. (2022). Taking Stock: New Public Management (NPM) and Post-NPM Reforms-Trends and Challenges. In A. Ladner, & F. Sager (Eds.), *Handbook on the Politics of Public Administration* (pp. 38-49). Edward Elgar Publishing. https://doi.org/10.4337/9781839109447.00010

Edelenbos, J., Molenveld, A., Mojanchevska, K., Ensenado, E., Ballinas, M. B., Esteban, A. et al. (2021). Community-Based Initiatives in the Urban Realm What Conditions Their Performance? *Journal of Environmental Planning and Management, 64,* 1689-1712. https://doi.org/10.1080/09640568.2020.1837088

Elayah, M., Al-Sameai, N., Khodr, H., & Gamar, S. (2024). Community-Based Initiatives

and Public Services Delivery in a Fragile Context: The Case of Yemen. *Nonprofit and Voluntary Sector Quarterly, 53,* 5-28. https://doi.org/10.1177/08997640221145182

Fischer, C., Heuberger, M., & Heine, M. (2021). The Impact of Digitalization in the Public Sector: A Systematic Literature Review. *der Moderne Staat—Zeitschrift für Public Policy, Recht und Management, 14,* 3-23. https://doi.org/10.3224/dms.v14i1.13

IREMBO (2025). *Irembo Platform.* https://irembo.gov.rw

Kalonda, J. K., & Govender, K. (2021). Factors Affecting Municipal Service Delivery: A Case Study of Katima Mulilo Town Council, Namibia. *African Journal of Public Affairs, 12,* 1-26.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. *Sage Open, 11,* 1-15. https://doi.org/10.1177/21582440211047576

Larsson, A., & Teigland, R. (2019). *Digital Transformation and Public Services: Societal Impacts in Sweden and Beyond* (p. 378). Taylor & Francis.

Mensah, I. K., & Adams, S. (2020). A Comparative Analysis of the Impact of Political Trust on the Adoption of E-Government Services. *International Journal of Public Administration, 43,* 682-696. https://doi.org/10.1080/01900692.2019.1645687

Milakovich, M. E. (2021). *Digital Governance*. Routledge. https://doi.org/10.4324/9781003215875

Milukutu, A., & Siachisa, M. (2023). Assessing the Impact of Digital Transformation on Employee Performance in the Public Sector: A Case Study of Zambia's Ministry of Health Headquarters (2017-2022). *International Journal of Humanities, Social Sciences and Education, 10,* 118-126. https://doi.org/10.20431/2349-0381.1009013

MINECOFIN (2024). *Annual Report 2023-2024.* http://www.minecofin.gov.rw

Ministry of Local Government (MINALOC) (2025). *Annual Report Annual 2024-2025.* https://www.minaloc.gov.rw/

Ministry of Local Government (MINALOC) Survey (2025). https://www.minaloc.gov.rw/

Mountasser, T., & Abdellatif, M. (2023). Digital Transformation in Public Administration: A Systematic Literature Review. *International Journal of Professional Business Review, 8,* e02372. https://doi.org/10.26668/businessreview/2023.v8i10.2372

Ndubuisi, G., Otioma, C., & Tetteh, G. K. (2021). Digital Infrastructure and Employment in Services: Evidence from Sub-Saharan African Countries. *Telecommunications Policy, 45,* Article 102153. https://doi.org/10.1016/j.telpol.2021.102153

Ojo, A., & Millard, J. (2017). *Government 3.0-Next Generation Government Technology Infrastructure and Services: Roadmaps, Enabling Technologies & challenges* (Vol. 32). Springer.

Portion, U. C., Chidimma, I., & Nwokike, C. E. (2023). Digital Transformation of Public Services and Its Influence on the Business Landscape in African States. *International Journal of Research Publication and Reviews, 4,* 467-472.

Susanto, A., Lee, H., Zo, H., & Ciganek, A. P. (2013). User Acceptance of Internet Banking in Indonesia: Initial Trust Formation. *Information Development, 29,* 309-322. https://doi.org/10.1177/0266666912467449

Terlizzi, A. (2021). The Digitalization of the Public Sector: A Systematic Literature Review. *Rivista Italiana di Politiche Pubbliche, 16,* 5-38.