NOVA IMS Information Management School

MGI

Master's Degree Program in

Information Management

TITLE

E-Government Service Delivery in Rwanda: Overcoming Infrastructure Limitations (A UN EGDI-Based Study for LDCs)

REMY SHARAMANZI

Masters' Thesis

presented as partial requirement for obtaining the Master Degree in Information Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

TITLE

E-Government Service Delivery in Rwanda: Overcoming Infrastructure Limitations (A UN EGDI-Based Study for LDCs)

by

REMY SHARAMANZI

Master Thesis presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Information Systems and Technologies Management

Supervised by

Mijail Naranjo-Zolotov

JULY, 2024

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, 15/07/2024.

DEDICATION

To my Family

ACKNOWLEDGMENTS

Completing this master's thesis has been a challenging yet fulfilling experience, characterized by personal growth and professional development. I am profoundly thankful to the Almighty God for his guidance throughout this chapter of my life. All glory belongs to Him.

I extend my sincere gratitude to my supervisor, Mijail Naranjo-Zolotov. Your invaluable assistance, insightful guidance, and encouragement have been pivotal throughout my research.

My heartfelt gratitude goes to my family, especially my siblings, for their love, patience, and support, their encouragement means the world to me.

I also wish to express my appreciation to NOVA IMS. The academic environment and resources you offered have greatly contributed to my professional growth. I extend my special thanks to all the professors for their invaluable guidance and support.

I am grateful to my colleagues at NOVA IMS. Their support has made this journey more enjoyable.

ABSTRACT

E-government is an excellent tool for achieving sustainable development by enhancing service delivery, transparency, and public participation, especially in least-developed countries. Rwanda, a developing country, despite its infrastructure limitations, is now a leader in e-government service delivery within Africa. The purpose of this study was to identify and explain the reasons behind Rwanda's success in providing e-government services. This study reviewed the literature and identified successes that led Rwanda to attain a high score in the Online Service Index (OSI) in the latest UN survey of the year 2022 about digital transformation, which measures the effectiveness and accessibility of e-government services. The findings of this study highlight the key factors, including user feedback, real-time data analytics, broadband expansion, digital awareness, the country's digital strategy, and private sector cooperation in Rwanda's digital ecosystem, which were mostly key factors in Rwanda's online service delivery success. The significance of Rwanda's success is that it demonstrates how strategy, planning, and innovation can help developing countries overcome the challenges they face in the digital age.

KEYWORDS

E-Government, Least-Developed Countries, Rwanda, Online Service Index,

Sustainable Development Goals (SDG):

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

LDCs	Least Developed Countries
ICT	Information and Communication Technologies
OSI	Online Service Index
UN DESA	United Nations Department of Economic and Social Affairs
PPPs	Public-Private Partnerships
EGDI	E-Government Development Index
SP	Service Provision
TEC	Technology
CP	Content Provision
EPI	E-Participation
MINICT	Ministry of Information and Communications Technology
HCI	Human Capital Index
TII	Telecommunication Infrastructure Index
IF	Institutional Framework

1. INTRODUCTION

In least-developed countries, where millions of citizens lack basic services, e-government initiatives appear as a solution that would bridge the digital divide and reinforce public service delivery (Dasgupta, 2010). The potential for such initiatives to use information and communication technologies to enhance transparency, citizens' participation, and access to key services can improve governance (Milakovich, 2021). However, there are significant challenges for least-developed countries to implement e-government, such as limited infrastructure, resource constraints, and the digital divide. Despite these challenges, Rwanda provides a unique example of how to overcome them by implementing strategic e-government initiatives. Notably, the country has made significant progress in overcoming major infrastructure limitations by investing heavily in new technological infrastructure, despite limited financial resources, and by trying to curb low digital literacy levels. This shows a great desire to achieve a high level of e-government services, which is reflected in its Online Service Index score (United Nations Department of Economic and Social Affairs, 2022).

Therefore, understanding the key success factors behind Rwanda's e-government service delivery is the focus of this study. This research aims to provide valuable insights for other developing countries seeking to enhance their e-government services by examining the strategic approaches that Rwanda has used, such as mobile technology, user-centric design, and public-private partnerships.

This research shall, therefore, offer valuable insights into how developing countries could strategically make use of e-government services to enhance citizens' participation in supporting sustainable development.

1.1 Objectives

Identifying and understanding the critical success factors behind Rwanda's high performance in e-government service delivery is crucial. This study aims to fill the gap in the existing literature by exploring these factors and providing insights for other LDCs. The primary objectives of this study are:

1. To identify the critical success factors behind Rwanda’s high performance in e-government service delivery.
2. To analyze the strategic approaches Rwanda has used to overcome infrastructure limitations.
3. To provide insights and recommendations for other LDCs aiming to enhance their e-government services.

1.2 Significance of the Study

This research provides insights into Rwanda's e-government strategies and their impact. By understanding the factors behind Rwanda's success, policymakers and practitioners in other developing countries can adopt similar strategies to enhance their e-government services, thereby promoting sustainable development and improving public governance.

2. LITERATURE REVIEW

2.1 INTRODUCTION

E-government initiatives offer significant benefits to both individual citizens and governments by promoting openness, effectiveness, and public participation in governance (Mutimukwe et al., 2019). These initiatives improve operational efficiencies, strengthen linkages amongst various segments, and facilitate new forms of cooperation and collaboration (Rajapakse et al., 2012). In least-developed countries (LDCs), e-government significantly enhances service delivery and engages citizens by reducing corruption, increasing transparency, and improving service efficiency (Muhimpundu & Jianxun, 2022). E-government helps connect governmental processes to the public through technology, making them more accountable, trusted, and participatory. This method modernizes public services, improves governance, and empowers people through efficient and transparent systems. However, implementing e-government in LDCs presents challenges due to inadequate technological infrastructure, limited resources, and digital divides(Nel-Sanders & Malomane, 2022).

This literature review aims to establish how strategic approaches can ensure the successful delivery of government services in LDCs despite the limitations of their infrastructure. The analysis will be based on a case study of Rwanda.

2.2 CHALLENGES AND OPPORTUNITIES OF E-GOVERNMENT IN LDCS

The service delivery of e-government in LDCs is hindered by an infrastructure deficit, characterized by a general lack of adequate ICT skills among the population, a low level of computer device ownership, limited access to electricity, and infrastructural to setup (Bakunzibake et al., 2019). In addition, inadequate non-technical elements of IP legislation and appropriate legal provisions for the protection of privacy are the factors causing the failures of e-government (Mutimukwe et al., 2019). These limitations necessitate improved infrastructure development, enhanced ICT literacy among citizens, and the institutionalization of online service delivery to foster efficiency and effectiveness.

Despite all these challenges, LDCs can still bypass conventional technologies if socio-technical aspects, organizational change, and contextual realities are addressed (Sang et al., 2009). This requires strategic collaborative efforts toward innovation and inclusive policies to bridge the digital divide and help LDCs harness the potential of e-government for sustainable development (Bakunzibake et al., 2019). By addressing root causes, adopting citizen-centric approaches, and ensuring interoperability and cybersecurity, LDCs can overcome these challenges and implement more effective e-government solutions.

2.3 Critical Success Factors for E-Government: The Case of Rwanda

Rwanda has been advancing e-government development with the initiation of the long-term vision that arises from its SMART Rwanda Master Plan (United Nations Department of Economic and Social Affairs [UN DESA], 2022). Digital transformation has focused on expanding ICT, increasing access to it, investing in its infrastructure, and increasing digital literacy amongst all citizens. The successful launch of the Irembo platform, which revolutionized service delivery by making 98 services available online, shows Rwanda's efforts towards achieving the goal of making all government services online (United Nations Department of Economic and Social Affairs [UN DESA], 2022).

2.3.1 Mobile Technology

In Rwanda, mobile technology has played a key role in bypassing traditional infrastructure limitations. By focusing on increasing access to smartphones and improving mobile infrastructure, Rwanda has used local production of digital devices to make technology more affordable and spur innovation (United Nations Department of Economic and Social Affairs [UN DESA], 2022). Programs aiming to improve accessibility for disadvantaged groups underline the potential of mobile technologies for inclusive e-government services (United Nations Department of Economic and Social Affairs [UN DESA], 2022). Disruptive approaches, including the power of wireless technologies, have continued to close this gap, thereby enhancing access to e-government services. By integrating mobile technology with digital solutions, Rwanda has been successful in improving access to primary services and information, hence contributing to Rwanda's socio-economic growth (Rarhoui, 2024).

2.3.2 User-Centric Design

One major success factor for e-government services in Rwanda is user-centered design. It has helped Rwanda cut costs, increase user satisfaction, and enhance productivity by involving users in design stages (Twizeyimana, 2017). With this focus on user experience and feedback, there has been a rise in the adoption of digitalized services that ensure efficient service delivery processes (Twizeyimana, 2017). The design of services taking inclusivity into consideration has prevented underutilization and ensured equal access to public services by all citizens (Mukamurenzi et al., 2021).

2.3.3 Public-Private Partnerships (PPPs)

PPPs have contributed to the development of e-government in Rwanda by solving issues such as infrastructure limitations, legal frameworks, and digital divides. Partnerships, facilitate project implementation through financial arrangements, coordination, and provision for long-term financing (Twizeyimana, 2023). It is the PPP that has bridged the gap of technological infrastructure, legislative obstacles, and gender imbalance in accessing ICTs, using their diverse pool of expertise and resources from both sectors, thereby contributing to the progress of e-government development in Rwanda (Twizeyimana, 2023).

2.3.4 Phased Implementation

The phased implementation approach has also been crucial in ensuring improvement in e-government service delivery in Rwanda. By breaking the implementation into different distinctive phases, Rwanda managed to better control progress and assisted in integrating into current existing systems (Bakunzibake et al., 2019)(Bakunzibake, Grönlund, et al., 2019). The phased approach has helped Rwanda systematically tackle challenges related to the transition and ensure the continuity of monitoring and evaluation activities as planned(Bakunzibake et al., 2019).

2.4 CRITICAL ANALYSIS

While advancements in e-government, key considerations and conflicting viewpoints remain regarding its implementation in LDCs. Key issues include the long-term sustainability of these initiatives without continuous funding and political stability (Sukarno & Nurmandi, 2023). Financial constraints, donor dependence, and politically unstable climates often disrupt the continuity of e-government projects (Chukwudi et al., 2023).

There is also a notable gap in reliable data on e-government status in Sub-Saharan Africa, highlighting the need for more research to understand contextual challenges such as infrastructure, policy, legal barriers, and skill factors(Twizeyimana et al., 2018). These unique circumstances in LDCs, including low productive capacity and geographical constraints, further complicate e-government sustainability, necessitating tailored solutions for universal digital inclusion(United Nations Department of Economic and Social Affairs [UN DESA], 2022).

Conflicting viewpoints on the scalability of Rwanda's e-government success highlight the complexities involved. Rwanda's strong political will and economic growth have facilitated its e-government advancements. However, other LDCs struggle due to a lack of policy vision and coordination (Kademaunga & Phiri, 2019). Additionally, varying social contexts, digital literacy levels, and cultural resistance impact the adoption of similar models in other countries (Adjei-Bamfo et al., 2020).

Rwanda’s e-government model provides valuable insights, but tailored approaches are needed for successful e-government implementation in LDCs.

3. METHODOLOGY

3.1 INTRODUCTION

This study uses a qualitative research approach to investigate the viewpoints on e-government service delivery. This approach involves collecting data from reputable sources relevant to our research subject. The study addresses the research questions by analyzing e-government services in Rwanda and using OSI value as a measure of efficiency and accessibility. Rwanda is an excellent case study because, despite being a low-income country, it has made significant progress in e-government service delivery.

3.2 JUSTIFICATION FOR SECONDARY DATA ANALYSIS

A methodology of secondary data analysis is considered appropriate for this research for several reasons.

- It will enable comprehensive understanding, therefore allowing for an in-depth review of academic literature, government reports, and other scholarly material which is very important for developing a solid grasp of the variables that influence e-government service delivery and the impact of the strategic plans.(Kara, 2023)
- **Efficiency:** The use of existing data is much faster and cheaper, and thus, it enables one to conduct an extensive analysis without collecting primary data. (Kara, 2023)
- **Breadth of Information:** The breadth of information for this study would be enhanced by access to a substantial repository of secondary data sources to expand the scope of the study of e-government services and their corresponding results. (Kara, 2023)
- **Identification of the research gap**: The approach will help in identifying areas where current studies have gaps.

3.3 DATA COLLECTION

The data collection for the study is based on relevant secondary data sourced from various credible sources, focusing on those directly related to the outlined research objectives. Sources are:

- **Academic Journals**: These will be peer-reviewed publications within their specific fields, such as public administration, information technology, and development studies. The focus will be on articles examining e-government service delivery models, factors influencing service quality, and the impact of strategic initiatives like the Smart Rwanda Master Plan.
- **Books and Book Chapters:** This category encompasses works by published scholars, including books and chapters on concepts related to maturity models, implementation strategies, and case studies in developing nations, with a particular emphasis on Rwanda.

- **Governmental Reports and Policy Documents:** This includes published reports and policy documents from Rwandan government agencies and international organizations such as the World Bank and the United Nations, detailing e-government service delivery initiatives and development strategies in Rwanda
- **Credible Online Sources**: Websites from highly regarded organizations

3.4 DATA SELECTION CRITERIA

The criteria for selecting data that ensure its quality and relevance are based on:

- **Date of Publication:** Preference will be given to recent publications, specifically those from the last 5-10 years, to ensure coverage of the latest research on e-government service delivery models, strategic planning, and their impact on service quality and citizen satisfaction.
- **Peer Review Process**: High importance is placed on academic journals and publications with a rigorous peer-review process, as this establishes the quality and credibility of the research.
- **Relevance to Research Objectives:** Sources must demonstrate relevance to the research objectives, particularly those addressing factors influencing the effectiveness and accessibility of e-government services.
- **Expertise of the Author**: Consideration will be given to the author's expertise and experience in subjects related to e-government, service delivery models, and strategic planning, especially how these areas intersect concerning citizen participation and administrative effectiveness in developing countries

3.5 DATA ANALYSIS

The data obtained from the reviewed literature and quantitative sources will be analyzed using a descriptive analysis approach. This approach involves summarizing and interpreting the data to identify patterns, trends, and relationships. The following steps outline the specific analytical methods used:

- **Summarizing Data:** Each source's literature will be summarized to identify common themes or topics related to e-government service delivery in Rwanda.
- **Trend Analysis:** Trends, patterns, and relationships among OSI scores and key indicators of e-government services will be analyzed to understand changes over time.
- **Visual Data Representation:** Graphs and charts will be used to visualize the data, making it easier to identify and interpret trends and patterns.
- **Comparative Analysis:** Information from different sources will be compared and contrasted under each identified theme. This includes comparing Rwanda's OSI scores with those of other LDCs to highlight differences or similarities.

- **Thematic Analysis**: Thematic analysis will be used to organize and summarize findings from the literature review and quantitative analyses, grouping data into identified themes.

To enhance the credibility of the research, this study has been guided by several main practices.

- **Transparency**: The strategy for the literature search, the selection criteria to identify relevant sources, and the thematic and quantitative analysis approach chosen are all clearly outlined in this chapter.
- **Source Credibility**: The quality of the sources being reviewed. The scholarly articles available on this subject matter, government reports, and international organizations' reports are considered to be reliable and offer high-quality information on e-government service delivery models and strategic planning, and their impact on citizen engagement and administrative efficiency in developing countries.

3.6 LIMITATIONS

- **Generalizability**: The extent to which the findings, based on available literature and OSI data, can be applied beyond the Rwandan context. While the research findings need careful contextualization within Rwanda to highlight their contribution to the e-government service delivery landscape in the developing world, their limits in generalizability must be acknowledged.
- **Reliance on Published Information**: Some important insights or experiences, may be missed. The literature review will use reports from international organizations and Rwandan government agencies combined with academic literature as much as possible.

3.7 ETHICAL CONSIDERATIONS

Following ethical guidelines, all sources are properly attributed with accurate and complete citations to ensure no plagiarism and uniformity in referencing, acknowledging all contributions to e-government service delivery models.

Conclusion

This chapter presented the methodological approach of this study to e-government service delivery in Rwanda, leveraging previously identified knowledge and data sources through secondary data analysis. It described how data collection will be done, the data selection criteria, and the plan for data analysis as descriptive and narrative. The chapter covered issues related to the quality and limitations of the research, aiming to provide transparency and credibility of sources. Finally, it covered ethical concerns regarding proper source attribution and data privacy protection.

4. FINDINGS

4.1 INTRODUCTION

Based on the analysis of Rwanda's e-government development using OSI scores from UN E-Government Surveys, this chapter reports findings. The findings are summarized in terms of Rwanda's OSI scores, key success factors, and comparative analysis with other countries.

4.2 ANALYSIS OF RWANDA'S OSI SCORES AND KEY SUCCESS FACTORS

The E-Government Development Index has three primary indices: an Online Service Index, a Telecommunication Infrastructure Index, and a Human Capital Index. Each index reflects different dimensions of the e-government landscape.

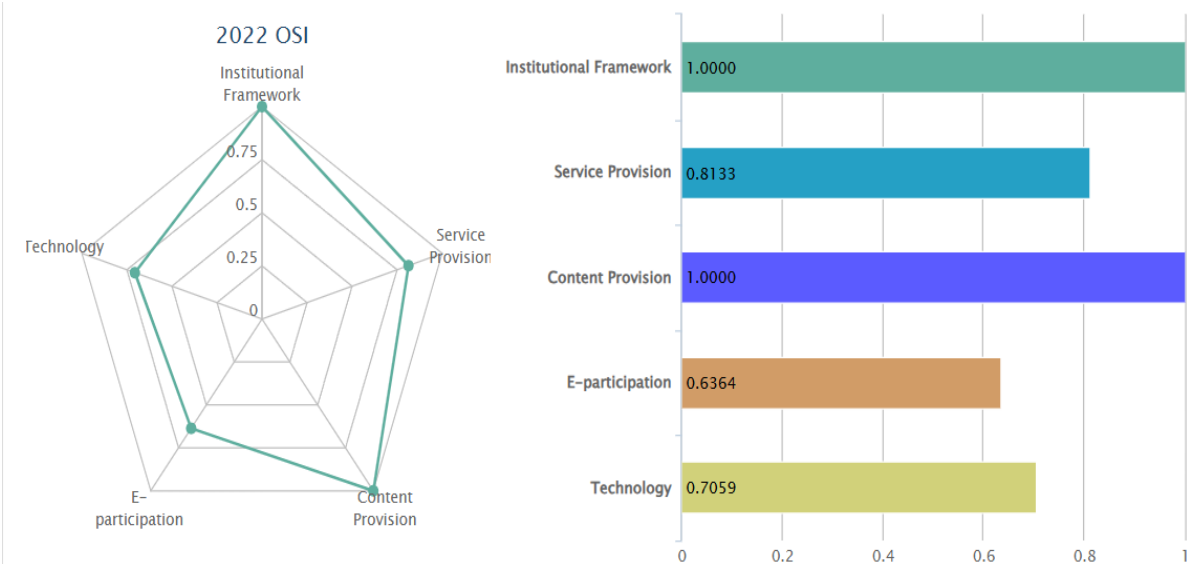
4.2.1 Overview of OSI Components:

The Online Service Index indicates the extent and quality of the services available online from the government. OSI is a composite indicator based on five weighted sub-indices, which include service provision, technology institutional framework supporting e-government development, content provision, and e-participation.

Explanation of OSI Sub-Indices:

- **Service Provision**—this refers to the extent public services are delivered online and their quality. For example, under Rwanda's IREMBO platform, citizens can apply for birth certificates online.
- **TEC:** The index examines the so-called technological infrastructure that supports e-government through aspects such as connectivity through the Internet and software systems. It is here that investment by Rwanda in a national fiber-optic backbone enhances connectivity.
- **Institutional framework:** This evaluates the presence of policies, regulations, and institutions that implemented reforms in support of e-government initiatives. In this regard, the Smart Rwanda Master Plan makes up for strong institutional support.
- **Content Provision (CP):** It evaluates the comprehensiveness and relevance of information available on the government website. For instance, Rwanda has made sure that the government websites are kept updated and relevant to citizens.
- **E-Participation (EPI):** An assessment of the degree of solicitation made by the government from the public through online channels. For example, e-citizen initiatives in Rwanda include online forums for public consultation on draft legislation.

Figure 1: Breakdown of OSI Sub-Indices for Rwanda (2022)



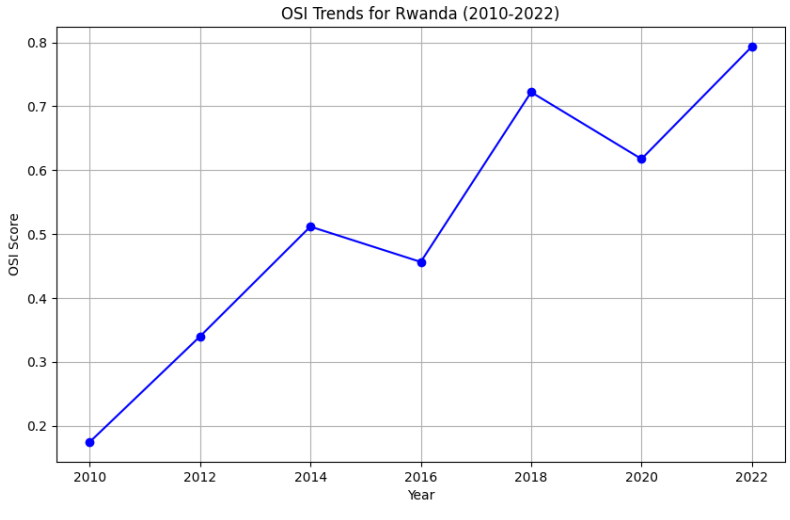
Source: UN E-Government Survey 2022

Table 1: OSI Trends for Rwanda Over the Years

Online Service Index	2022	2020	2018	2016	2014	2012	2010
Rwanda (Value)	0.79350	0.61760	0.72220	0.45652	0.51181	0.33986	0.17460

Source: UN E-Government Survey 2022

Figure 2: OSI Trends for Rwanda Over the Years



4.2.2 Factors of Success in Rwanda's E-Government Development

The following subsections describe the key factors of success that can be attributed to the high scores that Rwanda has achieved in the OSI index. These factors have been determined through an analysis of the e-government initiatives of Rwanda, backed by some relevant research and government reports.

1. User-Centric Approach Driven by Feedback

- Development of accessible online portals, easy to use, such as the IREMBO platform.
- Collection of feedback from users through surveys and meetings has enabled continuous development to ensure user satisfaction.
- Real-time Data Connection: Real-time data on the usage of services could additionally give insights to improve services based on user needs.

2. Real-time Data Enables Agility and Informed Decision-Making

- Rwanda is gathering real-time information, which aids strategic public planning with SMART analytics that keeps track of the performance in service delivery.
- Real-time information collection enables the government to promptly respond to issues and optimize resource allocation to better the general efficiency of services.
- Link to User Feedback: Data from the usage of the services in real-time can be used to understand user behavior and hence inform feedback mechanisms

3. Reducing the Digital Divide

- Programs so that households can acquire digital devices and provide training needed for millions of people to acquire digital literacy.
- Digital literacy programs empower citizens to use the e-government services effectively, hence enhancing their overall impact.

4. Clear and well-articulated policies to guide digital transformation

- The government is dedicated to digital transformation, with clear policies and regulations—for instance, the Smart Rwanda Master Plan. These policies mean that there is a cohesive and coordinated approach to digital transformation, hence setting an enabling environment for innovation.

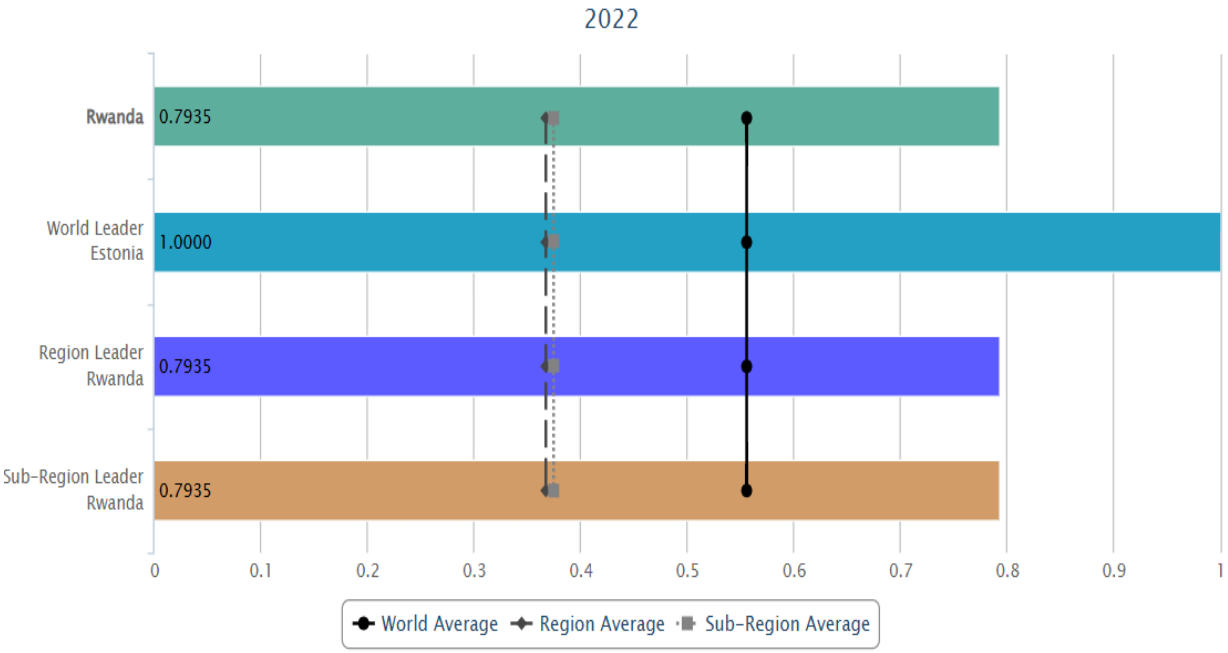
Table 2: Key Success Factors

Factor	Description	Source
User-Centric Approach	Development of user-friendly portals & feedback mechanisms	An Information Systems Artifact Approach to Evaluate e-Government Services in Rwanda (Mukamurenzi et al., 2021)
Real-time Data for Agility	Use of SMART analytics for performance tracking	ICT for GOVERNANCE CLUSTER STRATEGY 2020-2024 (MINICT, 2020)
Bridging the Digital Divide	Digital literacy initiatives and device access	RWANDA DIGITAL RIGHTS AND INCLUSION REPORT 2020
Clear Policies	Digital transformation policies and regulations	ICT for GOVERNANCE CLUSTER STRATEGY 2020-2024 (MINICT, 2020)

4.3 COMPARATIVE ANALYSIS

This section compares Rwanda's e-government performance with some of the selected African sub-region countries and with a country with a higher score in the online service index (OSI). The countries picked for comparison were: Kenya, Uganda, and Singapore. This selection was made to add a dimension to the development of e-government: regional neighbors sharing similar challenges and a high-income country with advanced technology infrastructure.

Figure 3: Summary of Rwanda's OSI Scores



Source: UN E-Government Survey 2022

Country Choice

•**Kenya:** This regional neighbor provides valuable insights because it faces comparable economic and infrastructural challenges as Rwanda. Kenya's e-government strategy provides an opportunity for exploring best practices that could be transferable knowledge relevant to the Rwandan context, especially in the areas of user-centered design and the use of mobile technologies for effective development.

- **Uganda:** Another LDCs in this region, Uganda acts as a benchmark to understand what type of challenges many LDCs usually face in e-government development. Comparing Rwanda and Uganda highlights the factors that have led to Rwanda's success in overcoming such challenges.

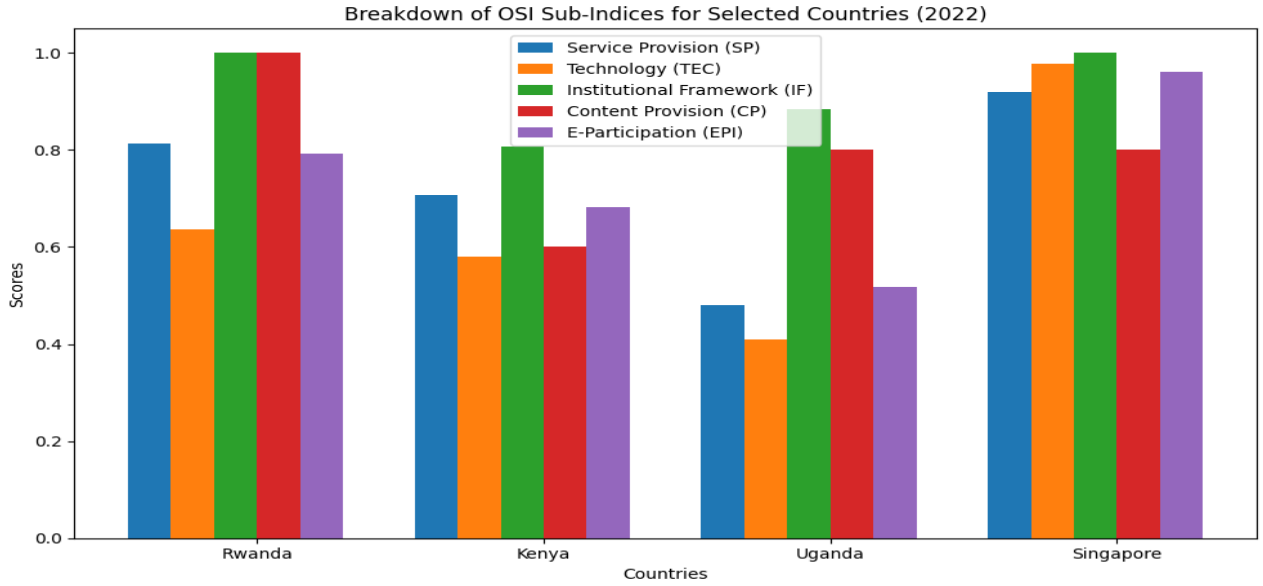
- **Singapore:** As one of the global leaders of e-government, Singapore tends to be a model for several areas of the development aspirations of Rwanda. Drawing from the advanced Singaporean e-government infrastructure and mechanisms of citizen participation, there are several possible areas where practices could be adapted in Rwanda such as data analytics for optimizing service delivery or creating a means of involving citizens using the e-government platform.

Table 3: Comparative OSI Scores

country	OSI Group	OSI 2022	IF	CP	SP	EPI	TEC	EGDI Group	EGDI 2022
Singapore	Very High OSI	0.962	1	0.8	0.92	0.9773	0.8824	Very High EGDI	0.9133
Rwanda	Very High OSI	0.7935	1	1	0.8133	0.6364	0.7059	High EGDI	0.5489
Kenya	High OSI	0.6821	0.8077	0.6	0.7067	0.5795	0.7647	High EGDI	0.5589
Uganda	Middle OSI	0.5169	0.8846	0.8	0.48	0.4091	0.3529	Middle EGDI	0.4424

Sources: UN E-Government Survey 2022

Figure 4: Breakdown of OSI Sub-Indices for Selected Countries (2022)



Analysis:

- Rwanda did well in terms of the institutional framework and service provision—it gets high scores in both, which shows a line of strong government support and also indicates the effective delivery of online services.
- In most categories, Singapore generally topped the list, which signifies well-established e-government infrastructures and high levels of citizen engagement in these cities.
- Kenya and Uganda have lower scores in TEC and EPI, which reflects shortcomings both in the technology infrastructure and in citizen participation.

5. DISCUSSION

5.1 INTRODUCTION

The chapter build on the analysis presented in Chapter 4, what explains Rwanda's e-government success using the Online Service Index as a core indicator. Through comparison between Rwanda's performance and that of Kenya, Uganda, and Singapore, this chapter derive broader implications for policy and practice, offering insights on improvement of e-government services in Rwanda as well as lessons for any other LDC.

5.2 DISCUSSION OF THE RESULTS

The data analyzed focused on Rwanda's OSI performance and key success factors with comparative insights drawn from Kenya, Uganda, and Singapore. These findings are discussed fully in this section.

5.2.1 User Feedback Boosts Services

Rwanda's Approach: In e-government services generally, the Government of Rwanda highly values user feedback, particularly from IREMBO where the platform is improved based on user suggestions.

OSI Connection: Improves E-Participation sub-index through usability, boosting EPI and Service Provision sub-indices through engagement.

- **Example:** Feedback from the users helped initiate procedures that would reduce the processes of gaining access to public documents. A continuous survey and direct interaction with the users ensured the satisfaction of user needs through the portal.
- **Mechanisms:** Feedback is gathered via online surveys, through social media, forums, and various interactive sessions directly with the users. Advanced analytics run data that is gathered to identify common issues and highlight areas for improvement.
- **Impact:** Increased rate of satisfaction of e-services utilization by users.

Comparison with Other Countries:

• Kenya: Like Rwanda, the eCitizen platform of Kenya uses user feedback to improve its services and hence satisfaction.

• Uganda: Poor collection and integration of user feedback hence affecting service delivery.

•Singapore: With sophisticated analytics and AI, there is constant collection and integration of user feedback to ensure a high rate of user satisfaction

Lessons for LDCs:

- Enhanced accessibility and engagement through the integration of mobile technology, such as Kenya's; there would be a place for the feedback mechanisms that were adopted by Rwanda. Singapore's setting, in turn, presents advanced feedback integration, entailing a continuous cycle of improvement.
- Iterative incorporation of user feedback has led to improved service quality and satisfaction, as evidenced by Rwanda's case. Such an approach increased OSI scores by prompting attention to the user's needs and smoothening the service process.
- **Counterfactuals**: Rwanda's success can be attributed to high political will, significant digital infrastructure investments, and effective public-private partnerships. While user feedback is critically important, these factors create an enabling environment for e-government success.

5.2.2 Real-time Data Enables Agility

Rwanda Approach: With real-time data and SMART analytics, Rwanda resolves service delivery problems exceptionally quickly, ensuring continuous improvement.

OSI Connection: Impacting SP and TEC sub-indices through the ability to have effective and responsive service delivery.

• **Example:** Due to COVID-19, this real-time data collection made it possible that at the peak of the outbreak, resources were promptly deployed to areas of outbreak.

• **Other uses:** Real-time data monitor service performance, detect bottlenecks, and thus the optimization of the allocation of resources.

• **Impact:** enhance efficiency in service delivery and ensure timely responses to public needs.

Compared to other countries:

•**Singapore:** Applied advanced data analytics in service optimization and citizen engagement.

•**Uganda:** Lacks comprehensive real-time data systems for fast responses to service delivery challenges.

Lessons for LDCs:

- Rwanda can adopt data analytics methods from Singapore as part of improving its service delivery and user engagement. Uganda has to invest more in real-time data collection and analytics. Real-time data in service delivery enable timely adjustments

and proactive measures, resulting in increased efficiency and satisfaction among the users.

- **Alternative Explanations:** Rwanda's effectiveness in using real-time data can also be attributed to investments in its digital infrastructure and a government committed to data-driven decision-making. making the services provision very agile.

5.2.3 Broadband Expansion Boosts Connectivity

Rwanda's Strategy: Rwanda has heavily invested in broadband and cellular networks, thus highly developing its digital infrastructure.

OSI Connection: Enhances the Technology (TEC) sub-index by improving the supporting infrastructure for e-services.

- Example: A national fiber optic backbone that is implemented and the rollout of 4G LTE.
- Impact: increased penetration of the internet, improved access to e-services.

Comparison to Other Countries

- Kenya: The country has also invested in Broadband infrastructure to expand e-government services.

- Uganda: Licensing and other policy challenges hinder the expansion of broadband, thereby setting limits to connectivity and access to e-services.

- Singapore: Well-developed broadband infrastructure supports seamless e-services and digital transactions.

Lessons for the LDCs:

- The investment strategies of Kenya are enlightening for further expansion of broadband. Uganda can reshape its digital strategy based on Rwanda's model. The comprehensive broadband coverage achieved by Singapore sets a benchmark for connectivity. Broadband connectivity extension has a direct implication on the availability and quality of e-government services, improving access and usage

- **Alternative Explanations**: Rwanda's broadband expansion success is also driven by strong policy support and strategic private sector partnership.

5.2.4 Digital Divide

Digital literacy interventions in Rwanda: Enhanced access to devices aims to reduce the digital divide, promoting socio-economic development.

Connection to OSI:

- Impacts both EPI and SP through increased access by citizens to e-services. Example: World Bank-financed projects improved the level of digital literacy for millions of people. Impact: Citizens Empowerment, increasing participation in governance, and enhancing economic prospects.

Comparison with Other Countries:

•**Uganda:** Low digital literacy and insufficiency of devices hinder the adoption of e-services countrywide.

•**Singapore**: Has wide-reaching schemes for digital literacy; great access to digital tools.

Lessons for LDCs

- No doubt, such initiatives would significantly help bridge Uganda's digital divide. Singapore offers valuable lessons in digital inclusion through its comprehensive approach. Higher digital literacy and access to devices are directly associated with the usage of e-government services, resulting in high OSI scores.

- **Alternative Explanations**: To this success in digital literacy initiatives in Rwanda, comprehensive policy frameworks and strong international partnerships characterized by financial and technical support have also played their parts.

5.2.5 Clear Policies Guide Digital Transformation

Rwanda's Approach: The Smart Rwanda Master Plan and related policies of Rwanda guide the e-government initiatives.

OSI Connection:

Enhances Institutional Framework Sub-index through good governance and regulatory support.

- Example: Policies in areas of data protection, cybersecurity, and e-participation.
- Impact: Coordinated digital transformation, attracted investments, and fostered innovation.

Comparison with Other Countries:

- **Uganda:** Lacks comprehensive policies, affecting coordination and implementation of e-government initiatives.
- **Singapore:** Has robust and well-enforced digital policies that guide its e-government initiatives effectively.

Lessons Learned for LDCs:

- The opportunity for Uganda to develop and implement clearly defined e-government policies. Clear and comprehensive policies offer a very accommodative environment for e-government initiatives geared toward structured and sustainable development. Singapore's policy frameworks are a model of structured digital governance

- **Alternative Explanations:** The effectiveness of the policies on digital transformation in Rwanda could also be due to strong leadership and institutional capacity, ensuring the implementation of these policies.

5.2.6 Private Sector Expertise for Improved Efficiency

Rwanda approach: The country utilizes public-private partnerships (PPPs) to improve e-government services.

OSI Connection: Contributing both to SP and TEC through advanced solutions integration and betterment of service delivery

- Examples: Effective PPPs with companies such as Rwanda Online Platform Ltd
- Impact: Better service delivery, innovative solutions, and efficient use of existing resources.

Comparison with Other Countries:

•**Uganda:** Utilizes PPP models but experiences problems in maximizing its potential due to less involvement from the private sector.
•**Singapore:** Collaboration with the private sector transfers expertise and innovation towards e-government services.

Lessons for LDCs:

- Uganda could improve from the successful PPPs models to improve its e-government services. Collaborating with the private sector introduces expertise, innovation, and efficiency in e-government services, leading to better OSI scores. Singapore provides a comprehensive PPP model that ensures maximum private sector involvement.
- **Alternative Explanations:** The PPP success story in Rwanda may also be related to enabling environments that occur through the adoption of friendly policies and rigorous government support for effective private-sector collaboration.

Summary

Rwanda scored highly in the OSI, an indication of improvement in providing online accessible and efficient services, thereby performing above most African countries and even some high-income countries.

Rwanda's e-government development journey offers a lot of lessons to other LDCs seeking to improve their online service delivery. By emphasizing a user-centered approach, real-time data use, and clear policy frameworks. Strategic investments in digital infrastructure, digital literacy programs, and public-private partnerships have established a strong foundation for e-government in Rwanda. The adaptation of the Rwandan success stories into the local context can help LDCs effectively improve e-government services, leading to better governance, improved citizen satisfaction, and a more inclusive digital society

Implications for LDCs:

For Policymakers:

- Ensure clarity in all-inclusive digital policies.
- Get stakeholders on board by showing the benefits of e-government
- Continuously invest in digital infrastructure.

For Practitioners:

- Improve services using real-time data and analytics.
- Public-private sectors can collaborate for e-government services.
- Implement Mechanisms for regular user feedback.

6. CONCLUSIONS AND FUTURE WORK

In this study, we have tried to identify the factors influencing the success of e-government service delivery in Rwanda, based on the Online Service Index (OSI) value. We examined critical success factors that have helped Rwanda overcome infrastructure limitations and make remarkable progress in e-government initiatives. These factors are user-centric design, real-time data use, infrastructure expansion, digital inclusion efforts, robust policy frameworks, and public-private partnerships. Despite limitations, such as reliance on secondary data, Rwanda's experience provides a valuable model for other LDCs aiming to enhance e-government service delivery for better governance. By focusing on these strategic directions, t LDCs can achieve higher OSI scores and overall e-government effectiveness, leading to improved governance, public satisfaction, economic growth, social inclusions, and a more empowered citizenry.

6.1 LIMITATIONS

The reliance on secondary data may lead to findings that are not comprehensive. With primary data, access could provide deeper insights into what factors play a role in e-government success. Furthermore, the context of Rwanda may not be exactly replicated in another LDC with a different socio-economic, political, and technological setting. The scope of the analysis was limited to the UN survey report and Rwanda Governance existing reports, which may not capture all dimensions of e-government service delivery. We did not consider other hindrances caused by the governance context

6.2 RECOMMENDATIONS AND FUTURE WORK

Future studies should be based on the collection of primary data through surveys, interviews, and multiple case studies in LDCs to better understand the challenges to e-government implementation and success factors. Investigating the impact of emerging technologies such as Artificial Intelligence, blockchain, and the Internet of Things on e-government services could bring out ideas on how to enhance the efficiency of services, security, and innovation in public service delivery.

Deep analysis of case studies of e-government initiatives in different LDCs could highlight best practices and contexts-specific strategies. This would involve reviewing existing technologies, the constraints to their use, and strategies for overcoming these constraints. Further studies on the policy framework and regulatory environment would elucidate the situation of most LDCs and help devise appropriate policy recommendations.

REFERENCES

Adjei-Bamfo, P., Domfeh, K. A., Bawole, J. N., Ahenkan, A., Maloreh-Nyamekye, T., Adjei-Bamfo, S., & Darkwah, S. A. (2020). An e-government framework for assessing readiness for public sector e-procurement in a lower-middle income country. *Information Technology for Development*, *26*(4), 742–761. https://doi.org/10.1080/02681102.2020.1769542

Bakunzibake, P., Grönlund, Å., & Klein, G. O. (2019). *Organisational Challenges in the Implementation of 'one-stop' e-Government in Rwanda*. *17*(1).

Chukwudi, C. E., Bello, W., & Adesemowo, M. M. (2023). E-Government and Democracy: A Boost to Sustainable Development. *JPPUMA Jurnal Ilmu Pemerintahan Dan Sosial Politik Universitas Medan Area*, *11*(2), 110–118. https://doi.org/10.31289/jppuma.v11i2.10651

Dasgupta, S. (2010). *Organizational Culture and Technology Use in a Developing Country: An Empirical Study*.

Haughton, O., & Barnes, D. (2023). A Comparative Analysis of E-Government in Jamaica and Singapore: An Exploratory Study of Supply-Side Factors. *Journal of Global Information Technology Management*, *26*(2), 116–144. https://doi.org/10.1080/1097198X.2023.2200395

Joshi, P., & Islam, S. (2018). E-Government Maturity Model for Sustainable E-Government Services from the Perspective of Developing Countries. *Sustainability*, *10*(6), 1882. https://doi.org/10.3390/su10061882

Kademaunga, C. K., & Phiri, J. (2019). Factors Affecting Successful Implementation of Electronic Procurement in Government Institutions Based on the Technology

Acceptance Model. *Open Journal of Business and Management*, *07*(04), 1705–1714. https://doi.org/10.4236/ojbm.2019.74118

Kara, H. (2023). *Creative research methods: A practical guide*. Policy Press. https://doi.org/10.51952/9781447366263

Maina, L. W., & Otieno, G. O. (2024). Leveraging Technology for Government Service Delivery: Suggestions for Securing the e-Citizen Service in Kenya. *East African Journal of Information Technology*, *7*(1), 81–91. https://doi.org/10.37284/eajit.7.1.1757

Mensah, I. K. (2020). Impact of Government Capacity and E-Government Performance on the Adoption of E-Government Services. *International Journal of Public Administration*, *43*(4), 303–311. https://doi.org/10.1080/01900692.2019.1628059

Milakovich, M. E. (2021). *Digital Governance: Applying Advanced Technologies to Improve Public Service* (2nd ed.). Routledge. https://doi.org/10.4324/9781003215875

Ministry of Youth and ICT. (2015). *SMART Rwanda Master Plan* (Kigali, Rwanda). https://www.minict.gov.rw/

Ministry of Youth and ICT. (2017). *ICT Sector Strategic Plan (2018-2024)*. https://www.minict.gov.rw/

Muhimpundu, N., & Jianxun, C. (2022). Citizens' Perceptions on the Use of E-Government as an Effective Tool to fight Corruption in Rwanda: E-government and Corruption in Rwanda. *Proceedings of the 2022 6th International Conference on E-Business and Internet*, 222–234. https://doi.org/10.1145/3572647.3572681

Mukamurenzi, S., Gronlund, A., & M. Islam, S. (2021). An Information Systems Artifact Approach to Evaluate e-Government Services in Rwanda. *14th International Conference on Theory and Practice of Electronic Governance*, 316–323. https://doi.org/10.1145/3494193.3494304

Mutimukwe, C., Kolkowska, E., & Grönlund, Å. (2019). Information privacy practices in e-government in an African least developing country, Rwanda. *THE ELECTRONIC JOURNAL OF INFORMATION SYSTEMS IN DEVELOPING COUNTRIES*, *85*(2), e12074. https://doi.org/10.1002/isd2.12074

Nel-Sanders, D., & Malomane, A. P. (2022). Challenges and best practices for e-municipalities. *Africa's Public Service Delivery and Performance Review*, *10*(1). https://doi.org/10.4102/apsdpr.v10i1.646

Rajapakse, J., Van Der Vyver, A., & Hommes, E. (2012). e-Government implementations in developing countries: Success and failure, two case studies. *2012 IEEE 6th International Conference on Information and Automation for Sustainability*, 95–100. https://doi.org/10.1109/ICIAFS.2012.6419888

Roger, M., Shulin, L., & Enock, B. (2021). The Impact of ICT Investment and Diffusion on Economic Growth: Empirical Evidence from Rwanda. *International Journal of Innovation and Economic Development*, *7*(4), 23–36. https://doi.org/10.18775/ijied.1849-7551-7020.2015.74.2002

Sang, S., Lee, J.-D., & Lee, J. (2009). *E-Government challenges in Least Developed Countries (LDCs): A case of Cambodia*.

Sukarno, M., & Nurmandi, A. (2023). E-Government Development Index Impact on World Governance Indicator Index in Southeast Asian Countries. *Journal of Contemporary Governance and Public Policy*, *4*(1), 97–114. https://doi.org/10.46507/jcgpp.v4i1.106

The Efficacy of E-Governance Policy and Practice in Uganda: A Perspective Review. (2022). *Public Policy and Administration Research*. https://doi.org/10.7176/PPAR/12-7-01

Thorpe, S. J., & Pokhrel, B. (n.d.). *A Review of Digital Government Challenges in Developing Nations*.

Twizeyimana, J. D. (2017). User-centeredness and usability in e-government: A reflection on a case study in Rwanda. *Proceedings of the Internationsl Conference on Electronic Governance and Open Society: Challenges in Eurasia*, 172–178. https://doi.org/10.1145/3129757.3129786

Twizeyimana, J. D. (2023). Towards realisation of the public value of e-government: Anticipation-reality gap and critical success factors in the context of Rwanda. *International Journal of Public Sector Performance Management*, *11*(1), 123. https://doi.org/10.1504/IJPSPM.2023.128539

Twizeyimana, J. D., Larsson, H., & Grönlund, Å. (2018). *E-government in Rwanda: Implementation, Challenges and Reflections*. *16*(1).

United Nations Department of Economic and Social Affairs [UN DESA] (Ed.). (2022). *The future of digital government*. United Nations.

APPENDIX

RWANDA UN E-GOVERNMENT SURVEY QUESTIONNAIRE 2022

United Nations | Department of Economic and Social Affairs

Member States Questionnaire (MSQ) for the United Nations E-Government Survey 2022

The objective of this questionnaire is to gather information from Member States in preparation of the United Nations E-Government Survey 2022. Please note that these responses do not directly affect the UN E-Government Development Index (EGDI), which is a composite index of the Online Service Index (OSI), Telecommunications Infrastructure Index (TII) and Human Capital Index (HCI). UNDESA assesses national portals with the assistance of independent researchers to construct the OSI, and requests data from the International Telecommunications Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to construct TII and HCI respectively. Inputs to the MSQ will be used by the United Nations E-Government Survey 2022 team for more in-depth country analysis, fact-checking and data quality assurance.

Refer here for a glossary of terminologies: https://publicadministration.un.org/egovkb

More information about the UN E-Government Survey:
https://publicadministration.un.org/en/Research/UN-e-Government-Surveys

For any questions about this questionnaire, please contact Madeleine Losch (email: loschm@un.org) and Rachael Purcell (email: purcell@un.org).

COUNTRY NAME*	Rwanda

Contact information

Your name*	Jean Claude NSABIMANA
Title*	ICT Statistics & Competitiveness Specialist
Organization*	Rwanda Information Society Authority (RISA)
Email*	jeanclaude.nsabimana@risa.gov.rw

Please select whichever applies*

- ☐ I am authorized and fully knowledgeable to respond to this questionnaire.
- ☐ A group of government agencies responded to the questionnaire collectively.
- ☐ I did not have the full information to respond to this questionnaire.
- ☐ I mostly provided my own opinion/assessment rather than official information.
- ☐ Other _____

1

A. Institutional / Organizational Framework

1. What is the official e-government portal at the national level? If more than one exists, please list all. *

https://www.gov.rw/services

2. Please provide links (Links) for portals providing specific services/features*

E-services or similar	E-SERVICES Portals are: IREMBO https://irembo.gov.rw RDB e-Services: https://rdb.rw/e-services/ Education Sector e-services: https://www.mineduc.gov.rw/services Health Sector e-services portal: https://www.moh.gov.rw/services **Finance Sector e-service portals** Central Bank: https://bnr.rw/home/ Ministry of Finance and Economic planning: https://www.minecofin.gov.rw/ Migration: https://www.migration.gov.rw/our-services/e-passport/ Service/information on COVID-19: https://www.rbc.gov.rw/index.php?id=707 TAX and REVENUES Service portal: https://www.rra.gov.rw/ **Justice Sector:** Ministry of Justice: https://www.minijust.gov.rw/services Rwanda Investigation Bureau (RIB): https://rib.gov.rw/index.php?id=371 Rwanda Integrated Electronic Case Management system(IECMS): https://iecms.gov.rw/en/ Rwanda National Police: https://www.police.gov.rw/home/ THE JUDICIARY OF RWANDA: https://www.judiciary.gov.rw/index.php?id=2 National Public Prosecution Authority(NPPA): https://nppa.gov.rw/index.php?id=118 Regulation Authority(RURA): https://rura.rw/index.php?id=23 Water and Sanitation: https://www.wasac.rw/home Electricity and utilities: https://reg.rw/index.php?id=2 Land: https://rlma.rw/index.php?id=67 Public Procurement: https://rppa.gov.rw/index.php?id=188 Local Government: https://www.minaloc.gov.rw/services Rwanda Social Security Board(RSSB): www.rssb.rw **Other Services can be found on the Government of Rwanda Service portal**: https://www.gov.rw/services
E-participation or similar	https://www.umuturage.gov.rw
Open government data	https://rwanda.opendataforafrica.org/

Public procurement	www.rppa.gov.rw or https://www.umucyo.gov.rw
Others (if any)	www.gov.rw

3. Please provide name and link of the government agency/department/ministry at the national level in charge of e-government. If more than one exists, please list all. *

Ministry of Local Government(MINALOC): www.minaloc.gov.rw
Ministry of ICT and Innovation(MINICT): www.minict.gov.rw
Rwanda Information Society Authority (RISA): www.risa.rw
Rwanda Governance Board: https://www.rgb.rw/
National Cyber Security Authority (NCSA): https://ncsa.gov.rw/
Rwanda Utilities and Regulatory Authority(RURA): https://www.rura.rw/

4. Does your country have a Chief Information Officer (CIO) or equivalent to manage its national e-government strategies/programmes? *

☐ Yes ☐ No
If yes, please provide contact information of national Chief Information Officer (CIO) or equivalent:

Your name*	Josephine NYIRANZEYIMANA
Title*	Government Chief Information Officer (GCIO)
Organization*	Rwanda Information Society Authority (RISA)
Email*	josephine.nyiranzeyimana@risa.gov.rw

Please provide links and details on the above, including coordination/integration between national and sub-national levels on e-government strategies/programmes.

The Chief Information Officer coordinate effort of the Government to implement National e-government strategy and other strategies or Programmes aimed to National Digital Transformation Agenda.
These Strategies/Programmes Listed below with Links:

1. ICT for Government Strategy: https://risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf
2. Government Sector Blueprint Guidelines: https://risa.rw/fileadmin/user_upload/Others%20documents/Enterprise_Architecture_Blueprint_Development_Guidelines_for_GoR..pdf
3. ICT Strategic Plan 2018-2024: https://risa.rw/fileadmin/user_upload/Others%20documents/ICT%20SECTOR%20STRATEGIC%20PLAN%202018-2024.pdf

Sectoral agencies/departments/ministries

5. Please provide names and links of the government agencies/departments/ministries at the national level in charge of the following*

Planning/development	Ministry of Finance and Economic Planning (MINECOFIN): www.minecofin.gov.rw/www.rdb.rw
Education	Ministry of Education (MINEDUC): www.mineduc.gov.rw
Health	Ministry of Health (MINISANTE): www.moh.gov.rw
Social Welfare (inclusion, social protection, etc.)	Ministry of Local Government (MINALOC): www.minaloc.gov.rw/www.loda.gov.rw
Employment and Labour	Ministry of Labour (MIFOTRA): www.mifotra.gov.rw
Environment	Ministry of Environment (MOE): www.moe.gov.rw
Justice	Ministry of Justice (MINIJUST): www.minijust.gov.rw
Economy/finance	Ministry of Finance and Economic Planning (MINECOFIN): www.minecofin.gov.rw/www.rdb.rw
Industry/trade	Ministry of Trade and Industry (MINICOM): www.minicom.gov.rw

B. COVID-19 Response and Recovery

6. Is there a specific national portal or a dedicated section addressing the COVID-19 pandemic*?

☐ Yes ☐ No

If yes, please provide link and more information about the specific national portal or dedicated section addressing the COVID-19 pandemic?

https://www.rbc.gov.rw/index.php?id=727
https://www.gov.rw/koronavirusi

7. Is there any specific budget allocated for new initiative/measure(s) of e-government in response to the COVID-19 pandemic and/or in supporting recovery? Please provide link and detail.

Government of Rwanda has put in place Economic Recovery Fund to supports business that have more affect by Covid-19:
https://www.bnr.rw/index.php?id=287

8. Is there a specific post-COVID-19 digital strategy for recovery and allocation of public resources (e.g. for digital transformation, digital inclusion)? Please provide link and detail.

https://www.bnr.rw/fileadmin/user_upload/ERF/Allocation_of_funds.pdf

C. Legal Framework

9. Is there any legislation, law or regulation on access to information, such as a Freedom of Information Act? *

☐ Yes ☐ No

If yes, please provide link and detail.

https://www.rlrc.gov.rw/fileadmin/user_upload/LawsofRwanda/Laws%20of%20Rwanda/9._Civil/7.10_MEDIA/7.10.3.%20Law%20N%C2%B0%2004.2013%20of%2008.02.2013%20relating%20to%20access%20to%20information.pdf

10. Is there any legislation, law or regulation on data privacy and/or protection? *

☐ Yes ☐ No
If yes, please provide link and detail.

https://www.minict.gov.rw/fileadmin/user_upload/minict_user_upload/Documents/Laws/Draft_-_Data_Protection_and_Privacy_Law___30-JAN-2020_Thursday___Final_Draft.pdf

11. Is there any legislation, law or regulation on cybersecurity or similar? *

☐ Yes ☐ No
If yes, please provide link and detail.

https://www.minict.gov.rw/fileadmin/user_upload/minict_user_upload/Documents/Laws/Law_on_prevention_of_cybercrimes.pdf

https://risa.rw/fileadmin/user_upload/Others%20documents/National_Cyber_Security_Policy_Rwanda.pdf

https://www.minict.gov.rw/fileadmin/user_upload/minict_user_upload/Documents/Laws/Law_establishing_the___NCSA.pdf

12. Is there any legislation, law or regulation on digital identity? *

☐ Yes ☐ No
If yes, please provide link and detail.

https://www.nida.gov.rw/index.php?id=21

13. Is there any legislation, law or regulation on digital signature? *

☐ Yes ☐ No
If yes, please provide link and detail.

https://www.govca.rw/download/PKI_REGULATIONS_ON_CERTIFICATION_SERVICE_PROVIDER_FINAL_2017.pdf

14. Is there any legislation, law or regulation on e-procurement? *

☐ Yes ☐ No

If yes, please provide link and detail.

https://www.umucyo.gov.rw/pt/pcm/moveLawList.do?menuId=PT01020200&leftTopFlag=l

15. Is there any legislation, law or regulation on digitally publishing government expenditure? *
Note: This is related to SDG Indicator 16.6.1

□ Yes □ No
If yes, please provide link and detail.

https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/LAWS/State_of_Finance_and_Property_Law/Law_on_State_Finances_and_Property.pdf

16. Is there any legislation, law or regulation on data sharing/exchange/interoperability across government agencies? *

□ Yes □ No
If yes, please provide link and detail.

The Law is under draft stage

17. Is there any legislation, law or regulation on open government data? *

□ Yes □ No
If yes, please provide link and detail.

The Law is under draft stage

18. Is there any legislation, law or regulation on the use of new/emerging technologies such as artificial intelligence (AI), robotics, block chains, 5G and Internet of Things (IoT)? *

□ Yes □ No
If yes, please provide link and detail.

Regulation on the use of emerging technologies is under draft

D. Strategy and Implementation

19. Is there a national e-government strategy or equivalent? *
□ Yes □ No
If yes, please provide link and detail.

https://risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

20. How long is the period/cycle of the national e-government strategy or equivalent? *
□ Two-year

□ Three-year
□ Five-year
□ Ten-year
□ Other _____

21. Is the national e-government strategy guided by or aligned with the national development strategy? Please provide link and detail.

https://risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

https://risa.rw/fileadmin/user_upload/Others%20documents/ICT%20SECTOR%20STRATEGIC%20PLAN%202018-2024.pdf

22. Is the national e-government strategy guided by or aligned with the Sustainable Development Goals (SDGs)? Please provide link and detail.

Yes,
Under Smart Rwanda Master plan(Below link) is aligned with SDGs

https://risa.rw/fileadmin/user_upload/Others%20documents/SMART%20RWANDA%20MASTER%20PLAN%202015-2020.pdf

23. Does the national e-government strategy make specific reference to or is aligned with sub-national/local e-government development strategy? Please provide link and detail.

The National e-Government strategy known as ICT 4GOV strategy is developed in line with National development strategy (NST-1: National strategy for Transformation, ICT Sector Strategic Plan (ICT SSP) and Smart Rwanda Master Plan as detailed in the following strategies

ICT 4 Gov strategy:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

National strategy for Transformation (NST-1):
https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/STRATEGIES/NST1/NST_A5_booklet_final_2.04.19_WEB.pdf

ICT Sector Strategic Plan (ICT SSP):
https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/STRATEGIES/Sector_Strategic_Plans/ICT.pdf

Smart Rwanda Master Plan
https://risa.rw/fileadmin/user_upload/Others%20documents/SMART%20RWANDA%20MASTER%20PLAN%202015-2020.pdf

24. Does the national e-government strategy make specific reference to e-participation, engagement and/or digital inclusion? Please provide link and detail.

Yes, the developed ICT 4GOV CLUSTER STRATEGY (Link below) IS aligned and take reference to e-participation, engagement and/or digital inclusion
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

25. Does the national e-government strategy make specific reference to a national data governance framework or similar? Please provide link and detail.

Yes, Details in the document with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

26. Does the national e-government strategy make specific reference to national digital identity? Please provide link and detail.

Yes, Details in the document with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

27. Does the national e-government strategy make specific reference to digital-by-default/digital-by-design/digital-first principle or similar? Please provide link and detail.

Yes, Details in the document with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

28. Does the national e-government strategy make specific reference to data-once-only principle or similar? Please provide link and detail.

Yes, Details in the document with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

29. Does the national e-government strategy make specific reference to the use of new/emerging technologies such as artificial Intelligence (AI), robotics, blockchains, 5G and Internet of Things (IoT)? Please provide link and detail.;

The existing E-Government strategy did not make reference to the use of emerging technologies, however there is draft of strategy for Emerging technologies and AI policy that include all below cited types Emerging technologies.

- Artificial intelligence (AI); link/detail: AI Policy under draft_____
- Robotics; link/detail: _this was considered in Emerging Technologies draft Strategy_____
- Blockchains; link/detail: __ this was considered in Emerging Technologies draft Strategy _____
- 5G; link/detail: ___ this was considered in Emerging Technologies draft Strategy _____
- Internet of Things (IoT); link/detail: __ this was considered in Emerging Technologies draft Strategy _
- Others; link/detail: ____other Emerging technologies like AR/VR, Autonomous Vehicle, 3D Printing, Digital Objects, etc are also considered in Emerging Technologies draft Strategy _____

30. Is the national e-government strategy aligned to any regional or global guidelines, recommendations or goals (e.g. United Nations, African Union, European Union, OECD)? Please provide link and detail.

Yes, Details in the document with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

31. Does the Government use any foresight tools, such as scenario planning, in visioning the future of digital government? Please provide link and detail.

Yes, details found in the link below:
https://risa.rw/fileadmin/user_upload/Others%20documents/SMART%20RWANDA%20MASTER%20PLAN%202015-2020.pdf

32. Does the Government have any measure in policy experimentation and/or regulatory sandboxes in using digital technologies? Please provide link and detail.

Link for detail information
https://www.rura.rw/fileadmin/Documents/ICT/Laws/Final_Draft_Regulation_Governing_the_Regulatory_Sandbox_in_Rwanda_v2.0.pdf

E. Digital Inclusion and E-Participation

Note: Vulnerable groups include women, older people, youth, people with disabilities, migrants, minorities and others

33. Is there a national policy/strategy or similar in ensuring digital inclusion and leaving no one behind? *

☐ Yes ☐ No
If yes, please provide link and detail.

Almost all Digital strategies and policies ensuring digital inclusion principles (Youth, Elderly, men and women, migrants, Rural and Urban)
Link for details:
https://www.rura.rw/fileadmin/Documents/ICT/Laws/Draft_Regulations_Governing_ICT_Accessibility_for_People_with_disabilities_and_the_Elderly_by_February_2021.pdf

34. Is there a national e-participation policy/strategy or similar? *

☐ Yes ☐ No
If yes, please provide link and detail.

Yes, The ICT 4GOV Cluster Strategy is serve as e-participation strategy with below link:
https://www.risa.rw/fileadmin/user_upload/Others%20documents/ICT4_GOV_CLUSTER_STRATEGY_2020-2024.pdf

35. Does the Government provide any specific measure(s) to ensure meaningful connectivity/access to e-government services by women and other vulnerable groups? *

☒ Yes ☐ No
If yes, please provide link and detail.

National Broadband Policy details the meaningful connectivity/access to e-government services with following link:
https://www.minict.gov.rw/fileadmin/user_upload/minict_user_upload/Documents/Policies/National_Broadband_Policy.pdf

Through the Broadband Policy, the following platform all users (Men, women, Youth, Elders, rural and urban users, people with disabilities, etc.) access the e-government platforms like the following:

1. https://www.irembo.gov.rw/home/citizen/all_services

Other E-SERVICES Portals

2. REMBO https://irembo.gov.rw
3. RDB e-Services: https://rdb.rw/e-services/
4. Education Sector e-services: https://www.mineduc.gov.rw/services
5. Health Sector e-services portal: https://www.moh.gov.rw/services
6. Finance Sector e-service portals
7. Central Bank: https://bnr.rw/home/
8. Ministry of Finance and Economic planning: https://www.minecofin.gov.rw/
9. Migration: https://www.migration.gov.rw/our-services/e-passport/
10. Service/information on COVID-19: https://www.rbc.gov.rw/index.php?id=707
11. TAX and REVENUES Service portal: https://www.rra.gov.rw/
12. Justice Sector:
13. Ministry of Justice: https://www.minijust.gov.rw/services
14. Rwanda Investigation Bureau (RIB): https://rib.gov.rw/index.php?id=371
15. Rwanda Integrated Electronic Case Management system(IECMS): https://iecms.gov.rw/en/
16. Rwanda National Police: https://www.police.gov.rw/home/
17. THE JUDICIARY OF RWANDA: https://www.judiciary.gov.rw/index.php?id=2
18. National Public Prosecution Authority(NPPA): https://nppa.gov.rw/index.php?id=118
19. Regulation Authority(RURA): https://rura.rw/index.php?id=23
20. Water and Sanitation: https://www.wasac.rw/home
21. Electricity and utilities: https://reg.rw/index.php?id=2
22. Land: https://rlma.rw/index.php?id=67
23. Public Procurement: https://rppa.gov.rw/index.php?id=188
24. Local Government: https://www.minaloc.gov.rw/services
25. Rwanda Social Security Board(RSSB): www.rssb.rw
26. Other Services can be found on the Government of Rwanda Service portal: https://www.gov.rw/services

36. Does the Government provide any specific e-service(s) for women and other vulnerable groups?

☒ Yes ☐ No
If yes, please provide link and detail.

Leaving none behind is a principle of the Government of Rwanda, and efforts such as awareness and digital literacy for all are made to infuse it and ensure e-services are accessed by youth, elderly, men and women, migrants, people in rural and urban settlement, as well as people with disabilities

https://www.rura.rw/fileadmin/Documents/ICT/Laws/Draft_Regulations_Governing_ICT_Accessibility_for_People_with_disabilities_and_the_Elderly_by_February_2021.pdf

37. Does the Government provide any specific e-participation measure(s) for women and other vulnerable groups? *

☐ Yes ☐ No
If yes, please provide link and detail.

The Almost all Digital strategies, policies as well as e-services platforms respect digital inclusion principles (Youth, Elderly, men and women, migrants, Rural and Urban)

https://www.rura.rw/fileadmin/Documents/ICT/Laws/Draft_Regulations_Governing_ICT_Accessibility_for_People_with_disabilities_and_the_Elderly_by_February_2021.pdf

38. Does the Government provide any specific measure(s) to build digital literacy/skills for women and other vulnerable groups? *

☐ Yes ☐ No
If yes, please provide link and detail.

The Almost all Digital strategies, policies as well as e-services platforms respect digital inclusion principles (Youth, Elderly, men and women, migrants, Rural and Urban)

Link for Digital Talent Policy for more details:

https://rwandatrade.rw/media/2016%20MINICT%20Digital%20Talent%20Policy.pdf

39. Does the Government use social media platform(s)? *

☐ Yes ☐ No
If yes, please provide link and detail if social media is used for (i) e-information; (ii) e-consultation; and/or (iii) e-decision-making

Following links provide details on social media used by Government of Rwanda

1. https://www.facebook.com/RwandaGov
2. https://twitter.com/RwandaGov
3. https://www.youtube.com/user/RwandaGov
4. https://www.instagram.com/rwandagovt/

Please include any guidelines for government officials/institutions on the use of social media.

The media regulation:
https://www.rura.rw/index.php?id=156

40. Does the Government publish information on how people's voices, including those among women and vulnerable groups, are included in policy decision-making? *

☐ Yes ☐ No
If yes, please provide link and detail.

Yes, the published information on decision making include people's opinion as women and other vulnerable people (eg. People with disability) are in positions of decision making.
Link below can provide detailed information:
https://gmo.gov.rw/index.php?id=192&L=%27%27%27

F. Usage, User Satisfaction and Evaluation

41. Does the Government monitor/collect usage statistics of e-government services? *

☐ Yes ☐ No
If yes, please provide link and detail.

Yes, and results are published on yearly basis by Rwanda Governance Board(RGB). Following is the recent publication:
https://www.rgb.rw/fileadmin/user_upload/RGB/Publications/RWANDA_GOVERNANCE_SCORECARD-RGS/RGS_7TH_EDITION.pdf

42. Does the Government measure user satisfaction of e-government services? *

☐ Yes ☐ No
If yes, please provide link and detail.

Yes, and the report always published every year,
Link for more details of the recent publication:
https://www.rgb.rw/fileadmin/user_upload/RGB/Publications/RWANDA_GOVERNANCE_SCORECARD-RGS/RGS_7TH_EDITION.pdf

G. Other information

43. Please provide information about any ongoing global/regional partnership and/or digital cooperation, focusing on e-government and digital technologies (e.g. enhance North-South, South-South, triangular, regional, and international cooperation) *

- There is partnership with Smart Africa secretariat in implementing smart city solutions (E-Waste collection, smart irrigation, IoT, etc.), MTN, KTRN; GIZ/DSSD to scale up digital solutions in different domains of Life of Rwandans
- Africa Development Bank (AfDB) partnering with Rwanda through Ministry of ICT and Innovation in development and deployment of single digital Identification project
- RISA/MINICT signed an MoU with GDS in UK on ICT planning harmonization standards

- EUROPEAN UNION SIGNS GRANT WITH GOVERNMENT OF RWANDA TO SUPPORT START-UP CREATION IN FOUR CITIES IN RWANDA (https://www.minict.gov.rw/news-detail/european-union-signs-grant-with-government-of-rwanda-to-support-start-up-creation-in-four-cities-in-rwanda)
- THREE-YEAR DIGITAL PROGRAM TO TRANSFORM DIGITAL ECONOMY AND PROVIDE MORE RWANDANS WITH WORK OPPORTUNITIES (https://www.minict.gov.rw/news-detail/three-year-digital-program-to-transform-digital-economy-and-provide-more-rwandans-with-work-opportunities)
- Partnership between Rwanda and KTRN, JICA on 250 startup projects,etc

44. Please provide any other information related to e-government development in your country.

Rwanda aspire to become Leading ICT Hub in Africa through digital government transformation.
To achieve this target, different policies and strategies have been developed and implemented; and to continue these initiative institutions have been established to focus on e-Government development plans and policies:

1. Ministry of ICT and Innovation: Leading Ministry
2. Rwanda Information Society Authority (RISA): implementer of ICT projects, policies and strategies
3. Rwanda Utilities and Regulation Authority (RURA): ICT Sector regulator
4. National Cyber Security Authority(NCSA): build skills and capacities in cyber security with a view to ensuring the protection of the national integrity and security in order to achieve economic and social development.

To this effort, the National Strategy for Transformation (NST-1) stipulates that 60% of citizens aged 15, + digitally literate while all Government Services digitalized by 2024. (Link for NST-1: https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/STRATEGIES/NST1/NST_A5_booklet_final_2.04.19_WEB.pdf

H. Consent to publish this Questionnaire

I/We authorize UN DESA to publish my/our responses as deemed necessary. *

☐ Yes ☐ No

THANK YOU

Thank you for taking time to complete this important questionnaire. We very much appreciate your participation.

Please complete this *OPTIONAL* Respondent Satisfaction Survey: https://forms.office.com/r/yTrKyZCjdT

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa