SUMMARY FINDINGS FROM NATIONAL CONSULTATION IN RWANDA

This report summarizes inputs gathered from participants in the EAC Digital Strategy National Consultation meeting that took place in Kigali in January 2023. Information is supplemented by additional material online where available.

The report is organized into sections as follows:

- **Policy and regulatory environment** - highlights existing strategies, policies and laws
- **Key stakeholders** - lists key institutions and their roles with respect ICTs
- **Overview of digital assets and capabilities** - provides a high level narrative of assets and capabilities around digital applications and service architecture, as well as data collection, management, use
- **Detailed inventory of digital assets by sector** - full list of priorities, applications, and tools for developing digital applications
- **Technology and workforce considerations** - describes basic power, connectivity, and workforce considerations that relate to the enabling environment for digital applications

Information gathered through the national consultation will inform the EAC Regional Digital Strategy by allowing identification of existing assets that may contribute to regional digital applications, identification of common needs across countries, shared priorities for future investments, and existing resources to inform feasibility of a regional digital platform. Please review and provide suggested edits or additional information in “Suggesting” mode no later than **March 14, 2023.**

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EAC DIGITAL STRATEGY NATIONAL CONSULTATION:

RWANDA

Summary: *Rwanda has many resources to support eGovernment services and the provision of digital applications and services across sectors. Rwanda has been developing and using an enterprise architecture approach for over five years and has developed governance structures as well as compliance mechanisms for the processes it sets forth. Rwanda continues to support sectors in developing sector-specific blueprints based on the national enterprise architecture and further strengthen the ICT capacities of its workforce.*

Policy and Regulatory Environment for ICTs

Rwanda has multiple strategies, policies, laws and regulations, as well as governance mechanisms to guide digital transformation.

The ICT for Governance Cluster Strategy 2020-2024 builds on prior investments to further digital transformation of public services, specifically through a focus on Governance Cluster institutions (groupings of government departments with cross-cutting programs), and aligned with the Government Pillar of the Smart Rwanda 2020 Master Plan. It is further aligned with the national priorities set forth in the following policy documents: National Strategy for Transformation (NST1) 2017 – 2024, the ICT Sector Strategic Plan 2018-2024, and Rwanda's forward-looking Vision 2050.

The ICT for Governance Cluster Strategy 2020-2024 furthers Rwanda's existing digital transformation by providing inclusive and personalized experiences with online digital government service delivery capabilities. The strategy promotes user-centric design of online services and the development of an evidence-based business case for digital government. The strategy includes detailed governance & coordination mechanism, proposed financing models and an implementation plan and a Monitoring and Evaluation Framework. Most importantly a sustained and sufficient budget allocation preliminary estimated at $48,858,000 is included.

The National Broadband Policy and Strategy 2022 builds on the momentum of past strategies and several of the above mentioned policy documents. It aims to expand broadband availability and increase affordability and adoption of broadband through five strategic objectives: access to affordable and quality broadband services, enhancing competition on infrastructure, promoting broadband as a catalyst for innovation, building local digital competencies and trust, and adopting agile methods of regulation.

These ICT strategic policies are complemented by supporting laws on data protection, cybercrime legislation and consumer protections.

Of particular importance for data driven services, the Protection of Personal Data and Privacy Law passed in 2021, which creates robust protections and protocols for the management and use of personal data, including digitized data. It provides rights for data subjects and the creation of data controllers and processors to take on specific roles towards management of data. It also includes requirements regarding the sharing of data outside the country. The law requires that the data controller or data processor store personal data in Rwanda unless the data controller or data processor has a valid registration certificate authorizing them to store personal data outside Rwanda, which is issued by the NCSA. This will likely have implications for data storage for regional digital applications.

Rwanda has passed a number of other laws relevant to digital applications and services and transmission of data online. The Cyber Crimes Law to prevent and punish cyber offenses. The Rwanda Competition and Consumer Protection Policy, a policy to support competition and provide consumers' protection from unfair competition business practices, and the Regulation Governing Unsolicited Commercial Communications, a framework on the use of unsolicited commercial electronic communications in Rwanda.

Governance Bodies and Key Stakeholders

Several government authorities exist to manage various aspects of ICT in Rwanda: Rwanda Information Society Authority (RISA), Ministry of ICT & Innovation (MICTI), National Cyber Security Authority (NCSA), and Rwanda Utilities Regulatory Authority (RURA).

- The Ministry of ICT & Innovation (MICTI) is mandated to monitor and evaluate the implementation of national ICT policies, strategies and programs, as well as develop and disseminate policies, strategies and programs for ICT and Innovation. The Ministry of ICTI is run through two key departments, the Digital Government Transformation and the Innovation and Business Development. Annually MICTI reports on select indicators to measure Rwanda's ICT sector performance and track ICT for development programs. For example, mobile phone and internet penetration, broadband access: 4G LTE deployment, and electronic financial transactions.

- Rwanda Information Society Authority (RISA) is at the forefront of all ICT projects' implementation and research, infrastructures and innovation within the ICT sector. RISA is the implementing body of Smart Rwanda Master Plan initiatives and coordinates all digital stakeholders. RISA is an affiliated institution to the Ministry of ICT and Innovation (MINICT).

- National Cyber Security Authority (NCSA) primary function is to coordinate national cybersecurity functions in Rwanda to ultimately protect citizens and all organizations from cyber threats. It is also responsible for compliance with the Protection of Personal Data and Privacy Law and the Cyber Crimes Law mentioned above. The NCSA provides guidelines for securing ICT infrastructure and information through its Directives on Cybersecurity for Network and Information Systems. NCSA also promotes national education programs, fostering awareness of cybersecurity best practices amongst the Rwandan population.

- The Office of Data Protection (ODP) was launched by NCSA in 2022 and oversees the implementation of the Protection of Personal Data and Privacy Law relating to the protection of personal data and privacy. They are the primary manager of personal data process requests

and requests by data subjects, and advise on data protection and personal privacy matters.

- The National Cyber Security Authority governs information and data security standards and compliance.

- Rwanda Utilities Regulatory Authority (RURA) regulates certain public utilities, including telecommunications networks and/or services.

- The National Institute of Statistics of Rwanda (NISR). NISR's role is to improve capacity to use data for evidence-based decision-making by coordinating the collection and archive of reliable data, to analyze, document and disseminate said data within an integrated and sustainable framework. GoR has adopted the National Data Revolution Policy 2017 and is in the process of implementing it through the Open Data Portal and the Big Data Unit at the National Institute of Statistics (NISR). The National Data Revolution Policy of 2017, aimed to establish standards and principles for data management, a data governance framework, human capital development and capacity building, and technology (software & hardware) development. NISR frameworks and strategies have to some extent responded to increasing data demand and capacity gap through various initiatives, e.g., Data Science and Training Center campus. The policy is led by NISR through collaboration with multiple stakeholders (Ministry of Finance and Economic Planning (MINECOFIN), Rwanda Development Board (RDB), Ministry of Public Service and Labour (MIFOTRA), and the Ministry of ICT and Innovation).

OVERVIEW: DIGITAL ASSETS AND READINESS CONSIDERATIONS

eGovernment and Enterprise Architecture Resources. RISA has supported a government enterprise architecture plan since 2016. The Rwanda Government Enterprise Architecture Framework (RGEA) provides the building blocks to enable MDAs in all sectors to document their architectures but also provide inputs for the development of other digital assets such as ICT plans, ICT roadmaps, and investment plans.

Each sector is meant to develop an architectural "blueprint" based on RGEA's governance model, principles, and standards in coordination with RISA. RISA offers several templates to assist sectors in data gathering related to business services, processes, functional units, and technology.

To date, all sectors have drafted Digital Transformation Blueprints together with an ICT strategic plan and ICT for government plan. The sectoral Digital Transformation Blueprints are in varying stages of approval. Absent approved sectoral-blueprints, RISA standards and guidelines are consistently utilized and enforced through RISA's sectoral Chief Digital Officers (CDOs). Eighty percent of government services are planned to be digitized by the end of 2024.

Interoperability. Rwanda does not have an interoperability framework, but recognizes the need to develop one to define the overall requirements for the implementation of data sharing. However, the government has invested in a Government Enterprise Service Bus (GESB), which is managed by RISA. Eventually all government applications will be plugged into the GESB to ease data sharing, minimizing one to one integration using APIs. An Interoperability Framework for the Ministry of Health has been developed and is in the approval stages and may be leveraged for a national framework.

Sector-Specific Digital Strategies. The Health, Education,and E-Commerce sectors have sector-specific strategies or policies that offer additional guidance on the development and use of the digital applications within their sectors. Further, all sectors have drafted, but not yet approved sector-specific Digital Transformation Blueprint and ICT strategic plan, based off of the RGEAGovernment Enterprise Architecture Framework. The draft Digital Transformation Blueprint
for the Agriculture Sector (also known as the Government Digital Platform 2.0) is a comprehensive plan to achieve digital transformation over four years.

Sectors also have a RISA Chief Digital Officer (CDO) for each sector. The CDO is responsible for ensuring the sector complies with existing policy and standards guidelines, the legal and regulatory environment, and mandates emanating from the national policies where applicable, e.g., the current ICT for Governance Cluster Strategy and the ICT Strategic Plan.

Digital governance. Rwanda possesses robust governance at the national level. Digital governance takes its lead from the Rwanda Governance Board (RGB) whose mandate is to promote good governance principles and monitor service delivery across public and private sector institutions as well as Civil Society Organizations. The majority of digital governance is driven by the MOICT through the ICT for Governance Cluster Strategy 2020-2024. The following digital governance structures are in place:

- **High Level Steering Committee** (HLSC) for the Governance Cluster includes: Executive Board co-chaired by the Ministers and/or Permanent Secretaries of MINALOC, MINICT, Justice Sector, MINECOFIN, membership of key IT/ Telecom CEOs should be also considered, and ii) General Assembly comprising appointed representatives from all 40 GC institutions, business and civil society. The HLSC meets twice a year.
- **Thematic Working Groups** (TWGs) serve as subsidiary coordination organs (of the General Assembly) for the implementation of targeted outputs. Members are based on thematic interests and pertinent responsibilities, institutions can be members of several WGs. Examples include workgroups on interoperability, data-driven government, digital identity and data protection. Thematics groups meet monthly.
- **Business & Civil Society Advisory WGs**. The MOICT supports formation of advisory working groups with business and civil society on an as-needed basis.

Sectors reported their own digital governance structures driven by the CDO within the sector. Most sectors reported active technical working groups. A good example is the Health sector who's **Digital Health Committee** functions as an internal technical working group composed of staff from digitization directorate general (including the CDO) and includes IT staff from affiliated institutions. It assists the Ministry with the digital transformation process by fulfilling monitoring processes to track progress against prioritized activities. In addition, a **Digital Health TWG** body is composed of staff from the Digitization Directorate General and identified staff from key health stakeholders.

Data management processes. Each sector's Digital Transformation Blueprint includes a data management strategy and guidelines. These follow RGEA as clear data management policies elucidated there. It is important to note the sectoral CDO is responsible for ensuring laws and national policies and guidelines are operationalized.

The Agriculture sector reported the consistent use of the following data management policies and guidelines: mobile devices management policy, data encryption agreements with data transmission stakeholders, and data anonymization guidelines.

Data quality and utilization. The CDO is responsible for data quality and data use. However, the Health sector's SOPs for data collection, data quality and assurance, records storage, data reporting, data access and sharing, as well as data use and dissemination are in use.

The Education sector has a department mandated to ensure data collection and data use through data analytics, as such the sector uses dashboards and other data visualization tools. The Agriculture, Climate and Trade did not report specific data quality mechanisms; however, it is assumed they exist under the purview of the CDO. The Health sector utilizes DHIS2 dashboards for data analytics.

National data sharing mechanisms. The Office of Data Protection (ODP) provides national direction and guidance on data sharing. ODP mandates institutions and all GoR employees acting as data controllers, data processors, or both of these roles, designate a Data Protection Officer (DPO) to lead compliance efforts. Data sharing mechanisms are supported by the Protection of Personal Data and Privacy Law which clearly articulates the who, what, when, and how data is to be shared domestically and outside of Rwanda. The National Cyber Security Authority (NCSA) manages and enforces data sharing. Given the passage of similar laws in Kenya, Uganda, and Tanzania, harmonizing specific aspects of data protection requirements will be critical for supporting regional applications drawing from data across multiple Partner States.

Sectoral data sharing. All sectors comply with the ODP mandates for registered data controllers and processors. All sectors reported having the requisite resources to follow these mandates and routinely use MOUs to support data sharing across institutions as needed. Documentation and other resources can be found on the ODP website.

In addition to national data sharing mechanisms, the Ministry of Health handles certain data falling outside of the ODP and NCSA guidelines. For this type of data not covered (e.g., ERP, medical equipment data) the Ministry is currently developing an additional data sharing policy.

Rwanda-EAC data sharing. The Agriculture and Trade sectors reported sharing data with EAC, though no other sectors did. The Ministry of Environment is sharing meteorological data, land data, and statistics.

The trade and finance sector participants reported an EAC Information Sharing Platform (EAC Trade and Logistics Platform) for EAC Partner States to share information about the movement of goods in the region. Through the Rwanda Standards Board (affiliated with MINICOM), Rwanda has integrated its Trade ePortal with the EAC Regional Trade Information Portal. Available data is based on mutual

recognition of product certifications to all certified products to enter any Partner State without undergoing quality inspection at the borders.

Data security. All GoR systems are hosted or shared in the national data center (NDC). Each Ministry contracts with NDC who ensure the security of the systems they host. The systems are scanned for vulnerabilities on a regular basis with feedback being communicated to system owners, who address the security issue. Ministry System Administrators manage the sectoral systems on a daily basis. Security Engineers from RISA and NCSA (National Cyber Security Authority) monitor the national systems on a daily basis. Security issues are communicated to the institution accordingly.

Data centers and infrastructure. A National Tier II Data Center (NDC) hosts all public data and is mandated by law. Sectors may opt to utilize their own servers; however, a dedicated VPN line must be connected to the National Data Center. Sectors are required to pay data hosting fees from their budgets. The NDC is co-owned by GoR and Korea Telecom. Its management is through Africa Olleh Services (AoS) Ltd. A Disaster Recovery Project is in place providing reliable ICT infrastructure for data hosting services, increasing Rwanda's information security and business continuity.

RELEVANT PRIORITIES AND ASSETS FOR A REGIONAL DIGITAL PLATFORM

Country-level assets and resources can offer critical foundations for the development of a regional platform following an enterprise architecture approach. This section provides a snapshot of several types of such assets, including:

- **Key strategic documents** that outline specific EA resource documents that may serve as models for the region, as well as any sector-specific priorities that can inform selection of use cases for the platform.
- **Existing applications** already in use in-country that could be considered for further scale or inform similar regionally relevant applications.
- **Tools or building blocks** that can support future application development such as:
    - resources for **creating interoperability** between digital system such as registries, data dictionaries, and interoperability frameworks
    - resources to **support sharing data across systems** including data sharing protocols, data standards, and data security standards
    - **infrastructure that could support existing and future digital applications** including data warehouses, data centers, and relevant infrastructure standards that may be helpful for harmonizing infrastructure-sharing agreements.

The tables below capture assets at a national, sector-agnostic level, as well as those within specific sectors.

Sector-Agnostic Resources

Asset	Details

Overarching guidance for e-Services applicable to all sectors	
Government of Rwanda Enterprise Architecture Framework	The Government Enterprise Architecture Framework guides public entities in establishing and implementing enterprise architecture with the end goal of establishing common architecture standards across all ICT functional units. The full framework is not a publicly available document.
Enterprise Architecture Blueprint Development Guidelines for GoR	Guidelines is to help public entities and GoR's private partners to have a common understanding of EA practice and to guide the systematic mapping of the institution's IT landscape (Blueprint).
Implementation Guidelines for GOR	Guidelines for a uniform framework for the design, configuration and management of ICT across government institutions. Key elements include: ● Network and communication infrastructure ● Hardware & end-user equipment ● Software applications and data ● ICT Strategic Plan guidelines/template ○ Mandates all institutions have individual 3 years ICT strategic plans linked to the overall strategies of the institutions. ● Regular ICT audits by RISA are conducted to ensure compliance and enforcement
Business Continuity Management Guidelines for GoR.	Guidelines for business continuity management including assets inventory and risk assessment, IT- disaster management and recovery
Data Center and Cloud Services Directives	A design standard including installation requirements and guidelines for data centers
Government Web Presence Project	Project objective is to increase online presence for government institutions (ministries, agencies, and embassies) through content and website development. RISA provides the required technical support, upgrade, maintenance and hosting for all government websites.

Government Command Center Project	A Business Intelligence and Analytics System to monitor and follow-up sectors performance by allowing real time datareporting. The project will enable sectors to have quick access to actionable information by providing a greater visibility of their respective GoR programs and projects performance. It will also enable improved coordination of programs and projects performance being executed at sector level, cluster level and national level.
ODP Data Protection Documentation	● Data Subject Consent Form ● Data Subject Consent Withdrawal Form ● Parental Consent Form & Parental Consent Withdrawal Form ● Data Retention Policy & Schedule ● Data Breach Response and Notification Procedure ● Data Breach Notification Form to the Data Subjects
Notable Applications	
RwandaOnline Platform (Irembo)	An e-Government platform enables the public to access government services online through the Rwanda Online platform
Document Tracking & Workflow Management System (DTWMS)	Document Tracking Management System enables users to send and work on documents by eliminating the paper-based approach in institutions. All documents can be tracked to which user or staff is handling them.
National Identification Registry	Managed by the National Identification Agency “NIDA” to integrate both civil registration of vital events and national population registry through digital and secure identity information system for legal identity.
Tools to support development of digital services and applications	
Technology Infrastructure	Infrastructure Standards ● RISA and RURA publish publicly available infrastructure standards Data Center ● National Data Center MIddleware ● Gov ESB

Agriculture & Climate

**Assets from the agriculture and climate sectors are combined in the table below given that climate change and adaptation activities are often related to agriculture objectives and climate is a relatively nascent sector. Where there were any specific assets related to climate change or adaptation reported, they are highlighted in green below.*

Asset	Details
Sector-specific digital priorities and strategies	
Digital Transformation Blueprint under development	The MoA is drafting a sector-specific digital blueprint based on the RGEA.
Digital Transformation Blueprint - under development	The MoE (Climate) is drafting a sector-specific digital blueprint based on the RGEA.
Strategic Plan for Agriculture Transformation 2018-24 *(Implementation Plan for National Agricultural Policy)*	Outlines priority investments in agriculture and estimates required resources for the agriculture sector.
National Agricultural Policy (NAP), 2018	The policy objectives broadly are economic opportunities and prosperity, improve food security and nutrition, and increase resilience and sustainability. Notable digital objectives include: ● Expand the body of publicly available data on prices and production, and facilitate market linkages between smallholder farmers, cooperatives, traders, and the processing industries, and provides a **mobile phone payment gateway** to facilitate transactions ● Establish **e-auctions** for coffee and tea to increase markets for quality coffee and tea. This will extend existing auctions such as Cup of Excellence.
Rwanda Agriculture and Animal Resources Development Board (RAB) Strategic Plan 2020-2024	The aim of the policy is to accelerate transformation and economic growth of the Agriculture and Livestock sub-sectors. Notable digital objectives are to: ● Promote digital innovations to enhance access to services and facilitates.

Rwanda Environment Management Authority Strategic Plan 2022-2026	Overall objective of this strategic plan is to realize improved environment management and increased resilience to climate change for sustainable development and livelihoods. There are no references to digital transformation in the strategic plan.
Services or functionalities to be digitized	• Build the interoperability for smart agriculture • Enhance farmer inquiry digital platforms • Contribute to affordable smart devices scheme • Strengthen market information systems • Farmer Management Information System (FaMIS) • Empower Agri-tech entrepreneurs/innovators to build responsive solutions • Support adoption of digitally accessible agricultural services The Agriculture sector list is fully documented and uploaded to the Joget repository which is managed by RISA.
Services or functionalities to be digitized	The environment sector developed a roadmap for digitized prioritized services with priority given to services with citizen and business impact these include: • G2C (Government to Citizen) • G2B (Government to Businesses and Organizations) • G2G (Government to Government) The Agriculture sector list is fully documented and uploaded to the Joget repository which is managed by RISA.
Notable digital applications	
Noz'Ubz	• Web-based agriculture extension system
e-SOKO	• LImited commodity marketing platform
Agriculture Land Information System (ALIS)	• Platform providing the list, classification, and boundaries of lands.
Tools to support development of digital services and applications	
Registries	none reported
Digital Application Under Development	There are nearly 70 services identified for digitalization in the Agriculture sector. These include agricultural advisory services,

	crop pricing information, VAT exemption for farmers, livestock insurance, purchasing pesticides, certification of origin, etc.
Digital Data Collection Tools	No formal data collection tools outside of entry data with tablets and web forms, with participants noting conformance to international standards tools.
Interoperability Platforms or Frameworks	No sector-specific interoperability platforms or frameworks
Data Sharing Mechanisms	Follow ODP and NCSA mandates.
Data Standards	Rwanda does not appear to have documented data standards for integrating data from disparate digital systems, though the draft Digital Transformation Blueprint for the Agriculture Sector does specify all data to be standardized across the sector. It is assumed all other sectoral Blueprints will include this level of detail.
Technology Infrastructure	Technology Infrastructure Standards ● The sector is utilizing technology infrastructure standards set forth by RISA and RURA. Data Servers and Centers ● Data hosted on a MoA server with connection to the National Data Center through a dedicated fiber VPN line per mandate.

Health

Asset	Details
Sector-specific digital priorities and strategies	
Fourth Health Sector Strategic Plan July 2018 – June 2024	● Prioritizes accessible, affordable, quality, and efficient delivery of healthcare as key pillars to enable Rwanda to achieve Universal Health Coverage.
National Digital Health Strategic Plan, 2018-2023	Not publicly available, though it has been shared. The plans includes: ● Strengthen integration and interoperability of health information systems ● Improve health service delivery and accessibility through Digital Health

	● Improve access to health information and digital services for citizens ● Improve collection, management and use of data at all levels of care ● Improve ICT infrastructure and software support in the Health Sector ● Improve the legal and regulatory framework for security, confidentiality and controlled access to information. ● Leverage technology to build the capacity of the health workforce, offer decision-support and prepare health workers at all levels to manage and use the full range of Digital Health technologies ● Promote research and development to adapt innovations and the use of emerging technologies in the health sector
Health Sector Information and Communication Technology (ICT) Security Policy *(not publicly available)*	The plans covers many aspects of information security including ● access control policies ● network protocols ● compliance ● business continuity management ● acceptable use, organization of information, asset management, personnel security, access control and systems & application testing ● a governance framework outlining the structure of ICT personnel in health sector
Digital Health Reference Architecture *(not approved or publicly available)*	The EA has been approved and the implementation is ongoing adhering to the Health Digital Strategic Plan. The Health Reference Architecture will be embedded in the Digital Transformation Blueprint
Digital Transformation Blueprint *(not approved)*	The MoH has drafted the Digital Transformation Blueprint for the Health Sector based on the RGEA. The document was not shared.
Services or functionalities to be digitized	● Health data and interoperability standards ● Health Information Exchange ● Electronic Medical Records ● Hospital Information Management System ● Development of Clinical and Operational Analytics ● Clinical Decision Support The Health sector list is fully documented and uploaded to the Joget repository which is managed by RISA.

Notable digital applications	
Notable Applications	● DHIS2 includes health systems dashboard ● Electronic disease surveillance and response (eIDSR) ● Rwanda Civil Registration and Vital Statistics (CRVS) system ● Rwandan Health Management Information System includes health systems dashboard
Tools to support development of digital services and applications	
Registries	● Client Registry ● Facility Registry ● Provider Registry ● Terminology Registry ● Shared Health Record
Digital Data Collection Tools	● Quality assurance mechanisms are based on data entered into DHIS2. Data is captured for public and private facilities. ● An M&E unit is responsible for data quality assurance in health facilities. Each Hospital has an M&E officer in charge of M&E activities who carries out the DQA at hospital and health centers in their catchment area on a regular basis. ● Each health facility (public or private) has a Data Manager who is in charge of collecting and analyzing data primarily using DHIS2. ● The sector adheres to the National Quality Assurance Framework, linked above.
Interoperability Platforms or Frameworks	Interoperability standards and interoperability framework have been developed and are in the approval process.
Data Sharing Mechanisms	In addition to national data sharing mechanisms, the Ministry of Health handles certain data falling outside of the ODP and NCSA guidelines. For this type of data not covered (e.g., ERP,

	medical equipment data) the Ministry is currently developing an additional data sharing policy.
Data Standards	• Utilizing data standards as set forth by the National Institute of Statistics for Rwanda • The Rwanda Medical Procedure Coding (RMPC) system • National List of Essential Medicines for Adults
Sector-Specific Technology Infrastructure	Infrastructure Standards • The sector is utilizing technology infrastructure standards set forth by RISA and RURA. Data centers and servers • Health data is hosted at the National Data Center

Education

Asset	Details
Sector-specific digital priorities and strategies	
Digital Transformation Blueprint *(under development)*	The MoE is drafting a sector-specific Digital Transformation blueprint based on the RGEA.
Education Sector Strategic plan 2018/19 to 2023/24	Three goals underpin the strategy: • promote access to education at all levels • improve the quality and education training • strengthen education and training to meet market labor demand
ICT in Education Policy	Participants suggested an ICT in Education Policy has been implemented over the last five years with a revised and updated ICT in Education Policy in development. The current policy document was not shared.
Services or functionalities to be digitized	All sectors in Rwanda are required to document a list of prioritized services. The Education list is fully documented and uploaded to the Joget repository which is managed by RISA. The full list was not shared.
Notable digital applications	

Schools data management System (SDMS)	• Collects and manages students information educational data (e.g., academic records) • Collects and manages school infrastructure data • Collects and manages school financial data • Collects and manages national examination registration with results reporting to students • Utilized for basis for decision making and analytics • Data input for annual Education Statistical YearBook
Teacher Management Information System (TMIS)	• Capture teacher data (e.g., qualifications) • Manages teachers placement to schools, capacity building, promotion, and termination among other data relevant to teachers. • Utilized at national, district, sector and school level
School Data Management Information Systems	• Kindergarten to high school MIS • University and polytechnic MIS
Tools to support development of digital services and applications	
Registries	• Student/Pupils Registry • Teachers Registry (TMIS) • Education sector utilizes the Citizen Registry (CRVS)
Interoperability Platforms or Frameworks	• No interoperability platforms or framework exists. APIs are developed for integration with external systems. Excel and CSV reports are utilized in some cases.
Data Sharing Mechanisms	• Follow ODP and NCSA mandates.
Sector-Specific Technology Infrastructure	Infrastructure Standards • The sector is utilizing technology infrastructure standards set forth by RISA and RURA. Data Servers and Center • Data hosted by the National Data Center.

Trade/eCommerce/Digital Finance

Asset	Details

Sector-specific digital priorities and strategies	
Rwanda Fintech Strategy 2022–2027	The Fintech Strategy has two key objectives: ● Set Rwanda up as a testing ground for fintech ● Establish Rwanda as a launchpad for fintech Three interventions have been selected based on global and country-based assessment of fintech: ● Improved regulatory guidance and clarity for Rwanda fintechs ● Improved inter-governmental coordination to support fintechs ● Regional leadership and proactive regional engagement
Digital Transformation Blueprint *(under development)*	The Trade and Finance sectors are drafting a sector-specific digital blueprint based on the RGEA.
Services or functionalities to be digitized	All sectors in Rwanda are required to document a list of prioritized services. The eCommerce list is fully documented and uploaded to the Joget repository (managed by RISA).
Notable digital applications	
Rwanda Standards Board ePortal	● No specific applications shared, however, all trade and finance services are accessed through the Rwanda Standard Board
Tools to support development of digital services and applications	
Registries	● Business Registration Registry In development: ● Client and Traders (active traders) registries.
Digital Data Collection Tools	● None specified
Interoperability Platforms or Frameworks	● No interoperability platforms or frameworks. ● Utilizing APIs for integration with external systems. ● Excel and CSV reports utilized in some cases.

Data Sharing Mechanisms	• According to ODP and NCSA mandates.
Data Servers and Center	• Data hosted by the National Data Center.

TECHNOLOGY INFRASTRUCTURE AND WORKFORCE: COUNTRY CONTEXT AND INVESTMENTS

Multiple projects are planned or underway to support additional investment in power, digital infrastructure, and workforce, as noted below.

Power and Electrification Projects

Current context: Rwanda Energy Group estimates approximately 72% of Rwandan households had access to electricity, including over 20% accessing through off-grid systems (mainly solar and minigrid). Rwanda's energy policy promotes additional investment in off-grid to reach last-mile areas. Rwanda has initiated several power generation projects to improve access to electricity. These include:

- Hakan Quantum Power Project: This is an 80 MW power plant in South Akanyaru prospect in Gisagara District. The project is a PPP between the Government of Rwanda and Hakan Mining and Electricity Generation Inc. & Quantum Power Ltd.

- Regional Rusumo Falls Hydroelectric Project: This project is located at Rusumo Falls at the border of Tanzania and Rwanda. The objective of the 80 MW project is to provide more electricity to growing population centers in Rwanda, Tanzania, and Burundi while ensuring that environmental aspects are well managed.

- Nyabarongo II (43.5MW) multipurpose: This project is expected to cater to water supply irrigation and electrical power generation. The project is fully funded by the Government of Rwanda and is expected to be completed in 2025.

Digital Infrastructure Projects

Current context: Rwanda has made significant strides in digital infrastructure, but adoption remains a critical barrier.The 2022 GSM report indicates that 42% of the population has broadband connections, 98% have access to 3G, with mobile phone penetration at 79%. Smartphone use is estimated at approximately 15 percent, potentially hindering access to digital services. Rwanda has initiated several on-going digital infrastructure projects, including:

- Digital Acceleration Project: This project is funded by the Asian Infrastructure Development Bank (USD 100 million) and the World Bank (USD 100 million). This project aims to support Rwanda's short-run and long-term recovery from the pandemic and resilience to future pandemics by increasing access to broadband and selected digital public services and

strengthening the digital innovation ecosystem. The project has four main components: digital access and inclusion, Digital public service delivery, Digital Innovation, and Entrepreneurship.

- The POSITIVO Project: This initiative is a collaboration between the GoR and POSITIVO BGH Ltd to set up a computer assembly plant to produce a range of quality ICT devices in Kigali, including laptops. The objective of POSITIVO GBH is to support the Government of Rwanda's policy to ensure that teachers and students each own personal laptops as a tool for teaching and learning.

ICT Workforce

Current context: Rwanda is increasingly strengthening its digital workforce. The Chief Skills Officer centrally manages the capacity development of government employees through the Rwanda Development Board. The government has initiated several initiatives to strengthen the iCT workforce and digital skills of Rwanda's citizens. Some of these include:

- RISA's ICT Training and Certification Program: This project aims to increase the number of skilled ICT professionals to satisfy the market needs. It is centrally managed by RISA. Every year, RISA conducts a digital skills gap analysis and a list of ICT certifications required to enhance the ICT skills of government employees.

- National Digital Talent Policy (NDTP): The policy calls for strengthening the framework for ICT training and qualification in Rwanda, placing emphasis on training and certification in hands-on, market oriented, globally benchmarked ICT Skills and Literacy courses. A component of the NDTPs, the Digital Ambassador Program is a national program, led by MINICT to increase the digital literacy of five million Rwandan citizens, and their resulting access and use of online systems and services.

- African Center of Excellence, in Internet of Things (ACEIoT) is a collaboration between the University of Rwanda and The World Bank. The ACEIoT aims to build a critical mass of African scientists and engineers in Internet of Things (iOT) through higher education (Master's and PhD level programs) and research.

- Kigali Innovation City: The Rwandan Development Board (RDB) and the Ministry of ICT and Innovation (MICTI) continue to build the Kigali Innovation City (KIC). Part of the KIC focuses on innovation capacity and workforce training. KIC currently houses two universities, the Carnegie Mellon University Africa, and the Africa Leadership University. A third university, the University of Rwanda Centre of Biomedical Engineering and E-health, is currently under construction. KIC will also be home to several start-up business incubators.

- Center of Excellence for ICT in East Africa- Regional Centre of Excellence in Embedded and Mobile Systems Hosted by Nelson Mandela African Institution of Science and Technology (NM-AIST). The Center aims to develop professionals in embedded and mobile systems, align university training with needs of public and private sector, and strengthen regional networking.