Republic of Rwanda
Ministry of ICT and Innovation

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Digital Transformation Center Rwanda

Digital Transformation center Quartery Progress Report

January - March 2023

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Introduction

Thank you for taking the time to read our quarterly update report and our successful collaboration during the past 3 months. Here we would like to list

Public sector innovation:
Here we keep track of all the important activities that contribute to the public sector in Rwanda. this time we would like to highlight:

- MININFRA Gap analysis
- Public Service Request Portal
- MINAGRI Grain Storage Management System
- NIRDA LabMIS

Artificial Intelligence:
Here we record all the important activities in the area of AI such as Machine Translation, Natural Language Processing and others. As highlights we would

- Capacity-building and awareness raising on Ethical AI Guidelines
- Policy Innovation Lab
- Landslide Monitoring Pilot
- AI-based farmer support system
- AI-based farmer support system

Digital Inclusion:
Here we record all important activities in the area of digital inclusion and digital literacy in order to contribute to the integration of vulnerable groups in

- Support to the Digital Ambassador Program
- Training of 7500 ICT Chamber
- Kinyarwanda Screen Reader Workshop
- Natural Language Processing Fellowship
- Open Machine Learning for Earth Observation Training
- NLP basics course for linguists

Ecosystem-building:
Here we record all important activities in the area of building the tech ecosystem, which includes topics such as startup promotion and networking. As

- Voucher System
- Rwanda Startup Fund Demo Day
- Westerwelle Entrepreneurship Programme in Rwanda and Tanzania)

2. Policy Developments and Dialogues

2.1 Capacity-building and awareness raising on Ethical AI Guidelines

The AI Hub, together with RURA and the Center for the 4th Industrial Revolution, is implementing an awareness raising and capacity building programme for companies and start-ups on how to effectively use the ethical AI guidelines developed by RURA.

Fifteen representatives from startups, SMEs, corporates, academia, and government institutions involved in AI systems development, deployment, and policies participated in the capacity building workshop which took place at the Digital Transformation Center Rwanda this October 18-19. Beyond the training aspect, the programme has also promoted peer-to-peer exchange among the participants and, thereby, foster the growing AI ecosystem in Rwanda.

The team has been working on a Playbook about ethical AI capacity building which serves as a guide for planning and conducting ethical AI training in the future, as well as a resource hub which hosts all the necessary training materials.

2.2 Policy Innovation Lab

MINICT is currently in the process of establishing a Policy Innovation Lab. The Policy Innovation Lab aims to increase the use of evidence and data in policy-making process, and will provide services across government institutions in Rwanda. GIZ has been supporting with the development of the operational model of the Policy Innovation Lab and has initiated a collaboration with the Policy Lab of the UK government for sharing of experiences and supporting the initial phase of the Lab.

3. Organizational Development

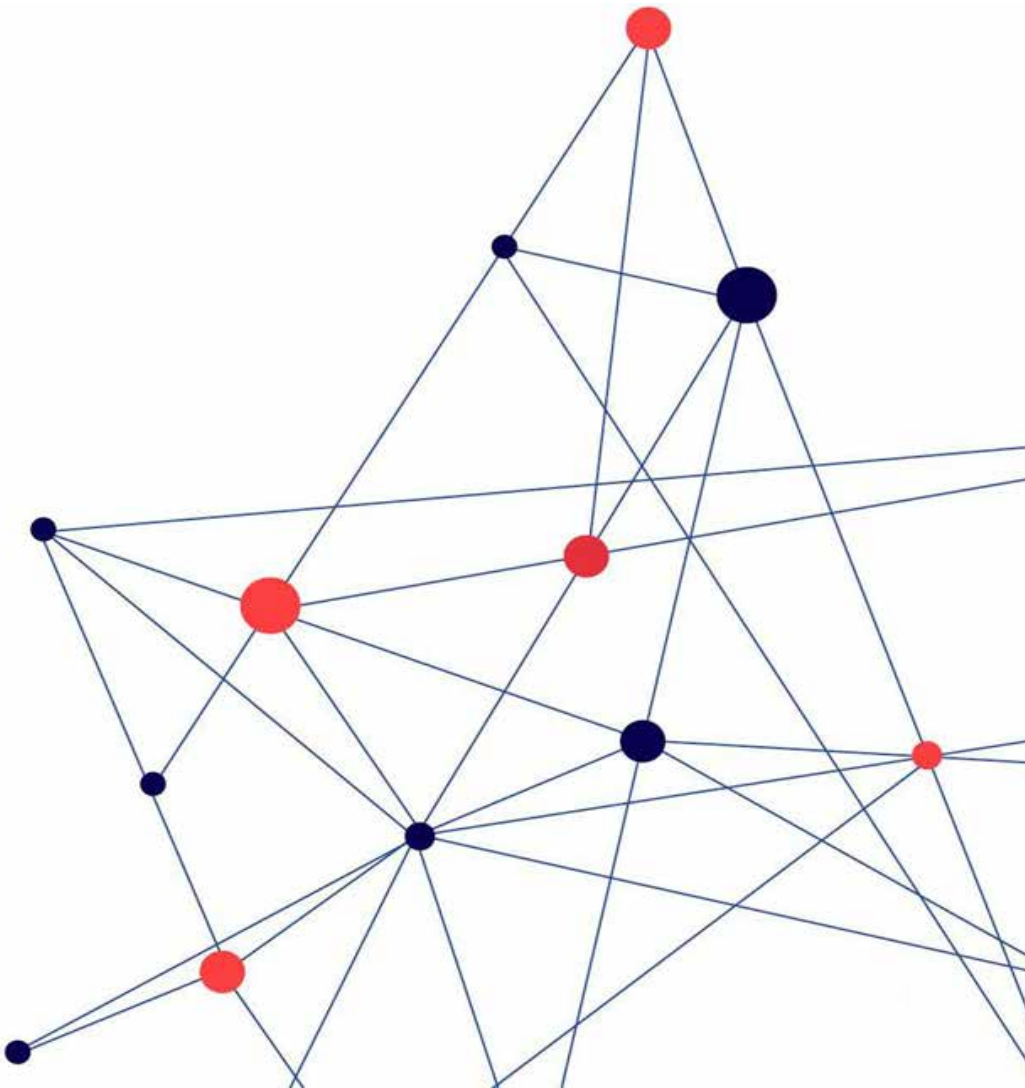
3.1 Digital Public Sector Fellowship 2nd Cohort

The Digital Public Sector Fellowship aims to attract young talent for the public sector while at the same time strengthening MINICT's capacity to implement digital projects.

During this quarter, the Digital Public Sector Fellowship started its second cohort with 8 new fellows based at MINICT. All of the fellows support on one or two bigger projects with a focus on innovation, entrepreneurship support, service digitization, digital literacy, or data frameworks. The DTC hosted an event in February for a joint get to know to strengthen collaboration between DTC staff and the Digital Public Sector fellows.

3.2 RISA Innovation Pipeline

Support government service digitization using low-code/No-code platforms to develop usable applications. Some of the applications developed include the government inventory management application, ICT needs assessment application.



4. Solutions & Innovation

4.1 Landslide Monitoring Pilot

The project pilots an optical monitoring system to detect landslides in endangered areas, initially focusing on a site in Nyabihu District. In cooperation with MINEMA(Ministry in Charge of Emergency Management) and the Rwanda Space Agency (RSA), the project aims at providing image and weather data openly via the Geospatial Hub of RSA to enable further analyses by stakeholders and to pioneer an AI solution. Finally, capacity building and skills transfer to local stakeholders to operate the system are facilitated and recommendations for Rwanda's early warning system for landslides and a possible integration of the system are developed.

In the past months, the data collection has started with almost 5000 images per day and weather data from the pilot location. More than 100 areas prone to earth movements have been identified for further analysis. The next step is to pioneer an AI solution for the automatic analysis of the collected data. In addition, the results from two multi-stakeholder workshops on the existing early warning system last year have been processed into initial recommendations for a future early warning system that are currently being refined through further interviews with the stakeholders.

4.2 AI-based farmer support system

Together with MINAGRI(Ministry of Agriculture and Animal Resources) and the Center for the 4th Industrial Revolution, the AI Hub is developing an AI-based farmer information system. The voice-based system will provide farmers with relevant information on aspects like farming practices, weather, and market prices in Kinyarwanda and is based on the architecture of the Mbaza AI Chatbot. The system will be developed with the Rwandan startup ecosystem through an innovation challenge. Over the past months, the AI Hub has been conducting user research to inform the development of the system. In particular, workshops were organized in Musanze and Huye to better understand the farmers' information needs and pain points with current systems.

5. Ecosystem

5.1 Artificial Intelligence / Natural Language Processing Community of Practice

AI-based farmer support system

The AI Community of practice brings together students, practitioners and researchers on AI in Rwanda to exchange knowledge and experience. Over the past months, the AI CoP in collaboration with AI6 Kigali has been providing machine learning training every Saturday, starting from February 4th and ending on April 29th. The program aims to equip AI enthusiasts in Rwanda with the skills necessary to succeed in the field of artificial intelligence.

As part of the community work, Digital Transformation Center Rwanda also hosted Umoja Hack 2023 in collaboration with the Pan-African data science platform Zindi. The hackathon brought together innovative thinkers to collaborate and create impactful data science solutions to some of the most pressing challenges facing the African continent.

Mbaza NLP community

From late January till March, the community has performed weekly sprints on building intelligent chat widgets for government service websites (particularly Irembo, and others such as RPPA and gov.rw). The community teams have cooperated to create content for the user intents and backend to configure how responses are fetched, but also on integrating speech recognition models.

On Friday 24th March,the community core team also had a meeting with Irembo CTO Patrick Ndjientcheu, on the prospect of partnership with Irembo to acquire a staging environment to deploy a chatbot to assist with user accessibility. Several synergies were observed from the meeting, with key highlights being the CTO's approval of the demo chatbot and endorsement of the community as a partner going forward.

5.2 Robotics Community of Practice

The robotics community of practice brings together people from academics, professionals, businesses and other sectors related to robotics for information sharing and networking to build a local support system. On the 23rd Feb we had a demo day where more than 30 participants witnessed the workings of a type of drone, an obstacle avoiding robot, and a lorry load sensing robot.

On April 30th, another demo session was held at the Digital Transformation The event was well attended, with participants from various organizations, including government agencies, tech companies, and educational institutions. The demo session aimed to showcase the latest developments in robotics technology, and how it could be leveraged to improve different sectors such as healthcare, education, and agriculture.

Zora Bots Africa presented their latest humanoid robots, which can be customized to fit different customer needs. They demonstrated how the robots can be programmed to perform different tasks, such as welcoming customers, answering queries, and providing information.

Farmoja LTD, on the other hand, showcased their latest drones, which can be used for precision agriculture, mapping, and surveillance. They demonstrated how the drones can be used to collect data and provide farmers with accurate information, such as soil moisture levels, crop health, and growth patterns.

The demo-session provided a platform for participants to network, exchange ideas, and explore potential collaborations. Participants expressed their appreciation for the informative and engaging event and the opportunity to learn about the latest robotics technology

5.3 Voucher System

A voucher system is an ecosystem-centric approach that has been implemented to support start-ups in accessing specialized tools, processes, or strategies needed in the short-term. The system involves collaboration with expert agencies and specialized hubs. So far, 60 startups have been supported through this system.

A new model for the voucher system has been designed by the team and was recently launched to the hubs in Kigali. The concept has been finalized, and three hubs will be contracted to work with the current consulting firms to support the remaining 120 startups. The start-ups are expected to receive services under the new model from May 2023.

In addition to this, two new voucher service providers have been contracted for product development (round 2) and management skills.

Overall, the voucher system has proven to be effective in supporting start-ups in accessing valuable resources needed to grow and succeed. With the new model and additional service providers, it is expected that more start-ups will benefit from this system in the future.

5.4 Rwanda Startup Fund Demo Day

In partnership with MINICT(Ministry of ICT & Innovation), we coordinated the graduation event of Hanga Pitch Fest 21 top startups.

Rwanda 2021 Pitch Fest Champions received a milestone-based funding from the government and an extensive six-month capacity building to achieve their milestones and scale. GIZ played a central coordination role to ensure the successful planning and delivery of the programme.

5.3 Westerwelle Entrepreneurship Programme in Rwanda and Tanzania

The Westerwelle Entrepreneurship Programme is a program implemented by the Westerwelle Foundation in partnership with GIZ/Make-IT in Africa and supports 30 tech startups in Kigali, Rwanda and Arusha, Tanzania. The programme provides capacity building, product development support, corporate & investment linkage, technical advisory services and other relevant expertise to accelerate startups' business growth.

To further enhance collaborations in the entrepreneurial tech space, the Westerwelle Foundation is organizing ***a virtual Ecosystem Tour on the 23rd of March 2023.***

6. Digital Literacy & Capacity Bulding

6.1 Support to the Digital Ambassador Program

The approach used in the Digital Ambassador Program focuses on enlisting young women and men to serve as catalysts for change in their communities by providing digital literacy training. The program selects Digital Ambassadors (DAs) from among young social innovators and deploys them to various communities across the country to offer training on how to access e-Government and other digital and mobile services through the Irembo Platform.

As of January 31, 2023, the project has been successfully concluded. Throughout its duration, a total of 98,141 citizens received training across all districts in Rwanda. Of these individuals, 46,479 were men, 51,662 were women, and 12 were people with disabilities.

6.2 Training of 7500 ICT Chamber

This is a training project implemented The ICT Chamber in all districts of Rwanda aimed at imparting basic digital literacy skills to 7500 entrepreneurs.

As the project draws to a close, it can be reported that 7525 entrepreneurs have been successfully trained. Of this group, 4030 are women, 3495 are men, and 126 are people with disabilities, indicating a fairly balanced gender and inclusivity ratio.

Additionally, the project provided support for training 100 trainers, who are now spread across all 27 districts of Rwanda, thereby creating a broader reach for the program and ensuring its sustainability in the long run.

6.3 Digital Literacy Training of 20,000 Farmers

We signed a grant agreement with One Acre Fund (OAF), an organization that is working with close to a million smallholder farmers in Rwanda since 2007. With the grant, the digital inclusion program of the organization shall be supported to scale after its successful pilot, training 5,000 farmers in 2022. OAF will use the grant to train 20,000 farmers (incl. 15,000 women and 200 farmers living with disability) in Rwamagana, Musanze and Gakenke distict. The grant was disbursed in January and OAF has now procured the equipment needed for the training.

6.4 Natural Language Processing Fellowship

In line with strengthening local technical know-how on AI, the AI Hub Rwanda together with the Rwanda information system society (RISA) is implementing a Natural language processing fellowship. In this NLP fellowship, the participants are expected to gain knowledge on NLP techniques particularly in machine translation and conversational AI chatbots.

The fellows completed the training phase with the final module on advanced text processing with deep learning models focusing on machine translation and conversational AI Chatbot. Fellows have begun working on their capstone projects, which span across various public and private institutions. The projects cover a diverse range of topics in the NLP sector.

To close the fellowship, a career day is planned where the fellows will have the opportunity to showcase their capstone projects. This event will provide a platform to the fellows to present their projects, highlight their achievements and share their experiences throughout the fellowship.

6.5 Open Machine Learning for Earth Observation Training

Together with the Rwanda Space Agency and the German Aerospace Agency, the AI Hub is implementing an Open Machine Learning for Earth Observation (ML4EO) Training Program which aims at providing the necessary skills for young professionals in Rwanda to make use of machine learning techniques with earth observation data. In addition, it aims at enabling participants to build use cases and business models to find their space in the upcoming ecosystem.

More than 300 applications were received, and 40 participants have been selected. During the past months, the ML4EO Training Program has been launched and the first modules have been successfully delivered. Currently, a ML4EO community of practice is set up and a strategy is created on how to guide participants in the project development phase through the involvement of actors from the ecosystem.

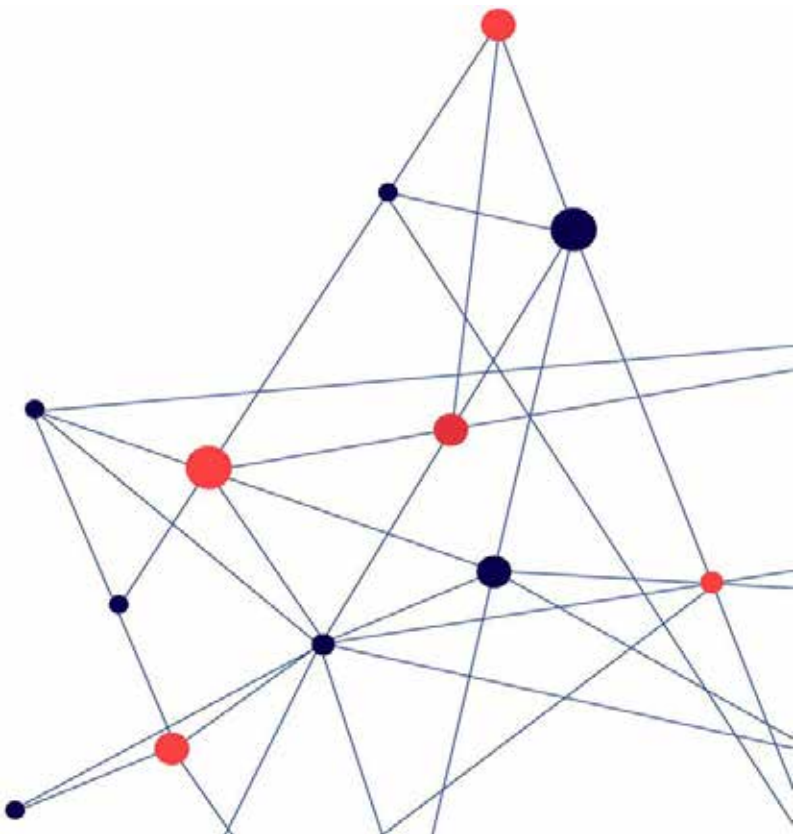
6.6 NLP basics course for linguists

In partnership with the School of Art and Languages, of the University of Rwanda (UR). Under this project we signed as MoU between GIZ and UR to establish the capacity development support and future work study opportunities for the linguistics cohort of their institute, under the project Output 4 – Machine translation.

The consultant team successfully did a needs-assessment study with 120+ participants and has received insights such as preference of training location, local knowledge on data annotation and creation, and others.
The curriculum is slated for an approval workshop in the last week of March, to prepare for a kickoff workshop with all local stakeholders in the linguistic community of Rwanda. Further dates of the course start are estimated to be in mid-April.

6.7 Kinyarwanda Screen Reader Workshop

The Digital Transformation Center hosted an in-person needs-workshop with organizations working with people with visual impairment in Rwanda and the target group to assess the option of developing a Kinyarwanda screen reader. The workshop was designed to capture needs and challenges of the target group and therefore included elements of human-centered design methodology. During the workshop, the participants gained valuable insights on the challenges visually impaired people in Rwanda face when accessing digital content and confirmed the relevance of developing a Kinyarwanda screen reader. Synergies with existing text-to-speech models were identified as crucial to make this a success.



7. Public Sector Innovation

7.1 KSEZ Sensor platform

The KSEZ sensor platform aims to KSEZ to improve cluster performance for competitiveness, innovation, productivity, and the creation of employment and efficiency of the user experience in the KSEZ. Some of the areas that the platform covers include among others;

- Management of entry and exit points for logs (cars, tracks, packages and people among others)
- Tenant safety (fire, electricity, water, etc for both emergency and consumption logging)
- Utility measurements (water, electricity outage, etc)
- PEZ/KESZ, analytics dashboard AIDC sensors and scanners monitoring

This exercise includes acquiring, testing, deploying and calibrating the sensors so that the above mentioned objectives are achieved.
The sensors have since been acquired and deployed with testing phase currently ongoing. The projected completion for this activity is slated for end of April, 2023.

7.2 MININFRA Gap analysis

This exercise aimed at carrying out a gap assessment as a precursor for creation of an ICT strategic plan for the infrastructure sector, which will guide the implementation of strategic interventions through the journey of digital transformation in the agencies that fall under the jurisdiction of MININFRA. These include but not limited to.

- Rwanda Energy Group (REG) (EUCL and EDCL)
- Water and Sanitation Corporation (WASAC)
- Rwanda Airports Company (RAC)
- Akagera Aviation

- Rwanda Housing Authority (RHA)

- Rwanda Transport Development Agency (RTDA) (Public transportation)

From the gaps that are identified, MININFRA is then able to identify the areas where digital solutions can be used to bridge them.
This exercise has been concluded and the data is being compiled and validated.

7.3 Blood Bank Information System (BBIS)

The National Center for Blood Transfusion (BT) is one division under Rwanda Biomedical Center (RBC) responsible for the collection, processing, testing and storage of blood in Rwanda. In effort to avail blood to the patients in the shortest possible time, the BT has deployed a strong decentralized system that manages 5 Regional Centers for Blood Transfusion (RCBT) distributed into the 5 provinces of the country. Each center is responsible to meet the blood needs from the health facilities located in their catchment areas. BTD has also been able to buy 2 Fridges for each Hospital Lab (1 for storage of packed Red Blood Cells and the other for storage of Transfusion Reagents). The BBIS is to be executed in the form of build, test, and deployment.

7.4 Public Service Request Portal

The Public Service Request Portal aims to provide visibility for the over 500,000 Public servants' s requests as made through the various ministries with Ministry of Public Service being one of those. As such, a public service request portal is to be developed to help achieve this. The portal is expected to digitize the service request process to address issues of handling, processing, tracking and management of service requests after they have been submitted and strengthen structures and linkages for requesters to increase efficiency.

The portal features will lessen the burden of manually managing processes required for processing service requests. As well as centralizing the entire process across the country. The System is expected to provide an interface that will be based on the current manual operations currently in use.
This activity is currently ongoing in the form of build, test and deployment.

7.4 MINAGRI Grain Storage Management System

MINAGRI wishes to establish a web-based system that will assist in the management, monitoring, and control of the grains stored in silos and warehouses. Viewed as a critical enabler, this system will support management that oversees the National Strategic Grain Reserves (NSGR) to manage, monitor and control silos and warehouse facilities in addition to tracking the inventory status in these facilities across the country.

This activity is currently in iteration 3 for the build, test, and deployment.

7.5 NIRDA LabMIS

NIRDA is in possession of two laboratories; one is NIRDA STEM for Industry (S4i) laboratory situated in Kigali (camp Kigali), and NIRDA life science laboratory (NIRDA-LSL) located in Huye District and managing these two laboratory resources and processes is quite challenging. This is in form of handling inventories, equipment and facilities among others. This causes delays in procuring reagents and consumables, maintenance, and equipment calibration in both laboratories. Additionally, sampling and sample handling (testing services) in the NIRDA life science laboratory is chaotic due to the amount of paperwork and individual signatures needed to process a test, and this excludes the tests from the STEM lab, which is not operational.

The NIRDA LabMIS aims to improve laboratory research productivity and efficiency by organizing and keeping track of data associated with samples, experiments, Laboratory workflows, and communication between NIRDA and its clients. These clients include start-ups, innovators, industries, individuals, and public institutions partnering with NIRDA.
This activity is currently ongoing in the form of build, test and deployment.

Imprint

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