Digital Transformation center Quartery Progress Report

October - December 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:

- Blood Bank Information
- 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 Ethical AI Guidelines / Web Assessment Tool

A newly developed web assessment tool provides AI developers in Rwanda with guidance on the importance of ethical AI and best practices on how to apply ethical principles to AI development in Rwanda. The tool has been developed in partnership with Saidot, a Finnish startup with vast knowledge in ethical and responsible advancement of AI.

The tool provides a structured, user-friendly and accessible approach for developers and other stakeholders to assess the ethical implications of AI systems in Rwanda. It guides users through a set of questions and prompts to help identify ethical issues and considerations in the development process. The tool also suggests best practices, learning resources and guidelines for ethical AI development.

The next steps include the formal launch of the web assessment tool, a pivotal moment in advancing ethical AI principles in Rwanda. Simultaneously, the handover of this tool to the Rwanda Utilities Regulatory Authority (RURA) signifies a commitment to embedding ethical considerations in national AI development policies. Pilot testing, in collaboration with the AI Community of Practice in Rwanda and the Mbaza NLP community, will provide valuable insights and feedback for refining the tool's efficacv

2.2 Awareness raising campaign for the National AI policy in Rwanda

In collaboration with MINICT, FAIR Forward Afri-media, and the Government of Rwanda are committed to drive AI innovation responsibly. As part of this commitment, an awareness campaign has been launched. The primary objective is to advance the implementation of the National AI Policy by fostering consensus and enhancing the capacity of diverse stakeholders in society.

The campaign is currently underway, encompassing various initiatives such as the creation of a sub-web page dedicated to the national AI policy and the development of an awareness roadmap. Additionally, efforts are focusing on organizing the first workshop on ethical AI, and releasing the inaugural social media content related to the national AI policy.

As next steps, the campaign will host workshops with different stakeholders to enhance the understanding of the policy implementation in the broader AI ecosystem. The campaign will also include a challenge and training around the UNESCO handbook for journalism "Reporting on Artificial Intelligence".

4. Solutions & Innovation

4.1 Landslide Monitoring Pilot

In cooperation with the Ministry in charge of Emergency Management (MINEMA) and the Rwanda Space Agency (RSA), GIZ/FAIR Forward piloted an optical system to monitor landslides in endangered areas. The project focused on a site in Nyabihu District where it collected image and other sensor data aiming to develop a computer vision algorithm to detect landslides and create a basis for further research. To ensure sustainability, local capacities and skills to operate the system as well as recommendations for an integration into Rwanda's early warning system were developed.

In the past months, computer vision algorithms to detect landslides were tested and a framework for future data analysis of the collected data was developed. All equipment and software components were handed over to the partner organizations and potential next steps were explored.
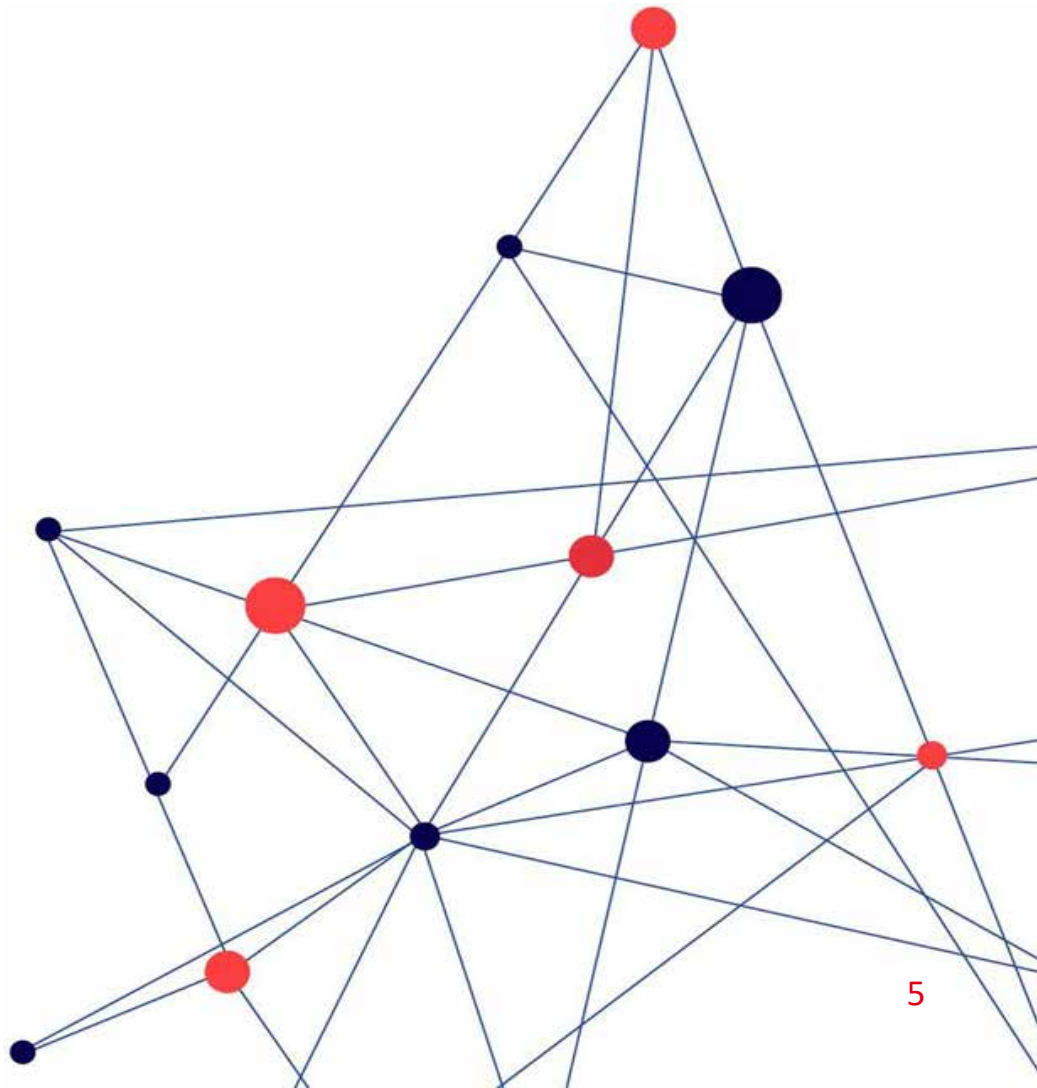

4.2 Machine Translation Use Case(s)

In partnership with Atingi, the AI Hub successfully completed the development of a use case in machine translation – English-Kinyarwanda automated translation for e-learning. The developed use case expands e-learning opportunities for Kinyarwanda speakers by providing a language switcher feature on the Atingi platform that enables course creators to translate from English to Kinyarwanda.

Towards sustainability, this translation plugin is designed for an open-source learning management system called Moodle, and all scripts, datasets, and translation models have been documented and published on GitHub. Other tech communities now have a steppingstone to finetune this model to other languages and refactor the plugin to work on other platforms that use the Moodle LMS. By enhancing the prerequisites for the utilization of machine translation in the public sector and the broader digital ecosystem, the project considerably contributed to advancing the development of digital solutions in Rwanda.

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Closing workshop for project sustainability and live demo with CLEAR Global, Digital Umuganda, and attended by Rwanda Cultural Heritage Academy (Dr. Jean Claude Uwiringiyimana and Egide Kabagema), National Council for Science and Technology(Dr. Louis Sibomana), and Moodle engineers from Rwanda Basic Education Board

5. Ecosystem

5.1 Artificial Intelligence Community of Practice

The AI Hub Rwanda, in collaboration with AI Saturdays Kigali, is hosting its second cohort, a 12-week program with two tracks – Deep Learning and Machine Learning. This initiative, aimed at making AI accessible to all by providing participants with free training on Saturdays. Led by experienced mentors, participants engage in practical learning using top-notch resources and work on impactful projects. The program not only develops AI skills but also promotes collaboration and the application of knowledge to meaningful projects, embodying the commitment to democratizing AI education.

During the Global Entrepreneurship Week, AI Saturdays teamed up with JASIRI and FAIR Forward, to host a session on "AI Startup 101: Insights on Building from Scratch." This dynamic workshop aimed to equip aspiring entrepreneurs with the essential knowledge and skills to navigate the intricacies of building AI startups. The session proved particularly impactful as it included AI Saturday's students in the audience, adding an enriching dimension to the learning experience

5.2 Mbaza NLP Community

The community maintaining the open source Mbaza chatbot stack has had a series of events in the closing of the year to enable members working on both the application layer and on AI models powering the conversational capabilities of the chatbot to collaborate and exchange with experts in the field.
In a first step, community coordinators Rene – a software engineer at CodeLand S.r.I – and Arnaud – a developer at MeshPower Rwanda – facilitated a series of code sprints to build a web widget that enables interaction between Mbaza chatbot and public platforms such as Irembo.

On the other hand, Antoine – a researcher at University of Massachusetts Amherst in AI & Embedded Systems – provided online sessions to present his research on language modeling for Kinyarwanda and covering other current topics in the field of Generative AI. These lectures were recorded and uploaded to the community YouTube page *(https://www.youtube.com/watch?v=-JoAfY80PsaU)*

Rene, community coordinator, pictured with members from SheCanCode.

5.3 Robotics Community of Practice

Robotics CoP is a platform where startups, robotics enthusiasts, students and other interested techies come together to share knowledge, skills and best practices. It is organized by DTC in collaboration with MINICT.

Since August 2023, we conducted two events, where participants got experience the Virtual reality of house models, interacted with Humanoids from Zora-Bot, received demos on Drone technologies like LIDAR, Aerial photography and Mapping. Additionally we received presentations and exchanges around the use of Internet of Things for farming.

5.4 Innovate Africa Challenge on AI for Climate Action

Together with Smart Africa, GIZ/FAIR Forward will organize a Pan-African innovation challenge to increase awareness of the potentials of AI to tackle climate change in Africa and to encourage relevant actors from all 39 Smart Africa member states to engage in the co-creation of innovative and context-specific AI solutions. The best teams will receive support for the development of their solution and have the opportunity to compete to win funding for the implementation of their idea.

In the past months, initial discussions with additional partners have taken place and consultants have been onboarded. The challenge will be launched in the first quarter of 2024.

6. Digital Literacy & Capacity Bulding

6.1 Robotics

The Government of Rwanda, in a collaborative effort through MINICT and MIN-EDUC, wants to invest heavily into its children's and youth robotics literacy. To support this, GIZ's digital literacy team is investing in three major activities:

• We are preparing an MoU with Coderina to invest into the expansion of Rwandan students to participate in the First Lego League challenge, a national and international robotics competition. The procurement of 65 new kits will allow over 300 children to participate.

• We have signed an MoU with the New Generation Academy (NGA), a primary school in Kigali, and are investing in the establishment of a laboratory for students in Kigali beyond NGA's own student body to allow access to high end Robotics experience and experimenting.

• Additionally, we are designing an innovation challenge aiming to invest in local, affordable and sustainable solutions that could ultimately reach all schools. Successful innovators will receive 50,000 EUR to invest in the further development of their prototype. you can find more about the challenge on all our social media platform

6.2 Digital Literacy for People with Disabilities

In collaboration with MINICT, GIZ/DSSD aimed to train at least 400 people with disabilities from rural areas on digital literacy through 10 organizations that support people with disabilities (OPDs).

All 10 contracted organizations supporting Persons with Disabilities (OPDs) have initiated training sessions for their beneficiaries, and seven of them already concluded the training. The three remaining are expected to conclude by the end of December 2023. The collective effort aims to train a total of 400 individuals with disabilities, with each OPD responsible for training 40 beneficiaries. CIBA Ltd., our ToT training partner has developed comprehensive training curricula available in both English and Kinyarwanda versions. Prior to the training, 30 trainers of the OPDs were trained in Kigali on using the curriculum.

6.3 Digital Literacy for 20,000 Farmers

The extensive training initiative aimed at 20,000 farmers concluded in August, surpassing expectations by reaching 22,021 farmers. This accomplishment surpassed the project target by 110%. Notably, 15,355 female farmers (exceeding 102% of the target) and 2,888 farmers living with disabilities (surpassing 144% of the project target) were included in the training.

At the end of October, the OAF team finalized their project, submitting the conclusive disbursement request, the final report, and the inventory lists.

6.4 Training of 1000 Women in Business in Kigali

Over the past 10 weeks, our team has diligently conducted digital literacy and entrepreneurship training for female members of the PSF Specialized cluster. This initiative, in collaboration with CENTUM Learning Ltd, aimed to train 1000 women (100 women per week). Initially, we encountered challenges related to inadequate mobilization efforts and venue infrastructure. However, proactive measures were implemented, including intensified mobilization through various groups and social media platforms. Additionally, we addressed venue infrastructure issues by ensuring ample internet connectivity and reliable electricity at the training venue.
Despite the above efforts to mitigate the challenges, we still were not able to reach our goal of 1000 women reason being the beneficiaries not meeting their end of the MoU agreement. We were appreciative of the support we received from MINICT through PS Yves.

Next steps:
•CENTUM Learning Ltd. will share a comprehensive report detailing the outcomes of the training once it concludes.
•A follow-up survey will be administered to select trainees three months after the training's completion to assess its impact and effectiveness.
•Wrap up meeting with MINICT, PSF Specialized Cluster and GIZ to ceremonially handover computers and discuss sustainability of the entrepreneur's desk.

6.5 Training on how to use the RINEX Infrastructure

The set of four trainings aimed at enabling 94 IT experts of 29 public institution to establish and maintain a connection to the Rwanda Internet Exchange Point (RINEX). The trainings have successfully been completed and seven institutions have already started to get connected.

6.6 Apple Labs

The Ministry of ICT and Innovation (MINICT), in partnership with Apple.inc, have come together to establish the Apple Accredited Training Center for Education (AATCE) program in Rwanda.

- The primary focus of this initiative is to introduce AATCE to five of the most prominent academic institutions in Rwanda, namely AUCA, Ines Ruhengeri, AIMS, UTB, and RCA.
- The program aims to enhance digital literacy, foster creativity, and promote innovation within these institutions, aligning with Rwanda's broader digital literacy and talent development goals.

GIZ in collaboration with MINICT, is financing the establishment of these five Apple Labs, further emphasizing the commitment to advancing technological education in Rwanda. The project framework is currently being prepared and will be followed by concept review, discussions, and agreements with stakeholders.

6.7 AI & Data science training program for Women

The AI4Women training program emerges as a strategic response to the global gender imbalance within the AI sector, particularly focusing on rectifying this disparity in the Global South. Presently, less than a quarter of AI professionals worldwide are women. This contributes to biased AI services due to the inadequate inclusion of experiences from women and marginalized groups during technology development.

This new training program will be provided by Huzalabs in close collaboration with the Move beyond consulting from South Africa and Blossom Academy from Ghana, is specifically designed for women aged 18 to 35 in Rwanda, encompassing various socio-economic, geographic, and educational backgrounds. With an emphasis on those with limited or no prior experience in data science, AI, or coding, the program aims to empower women with essential skills.
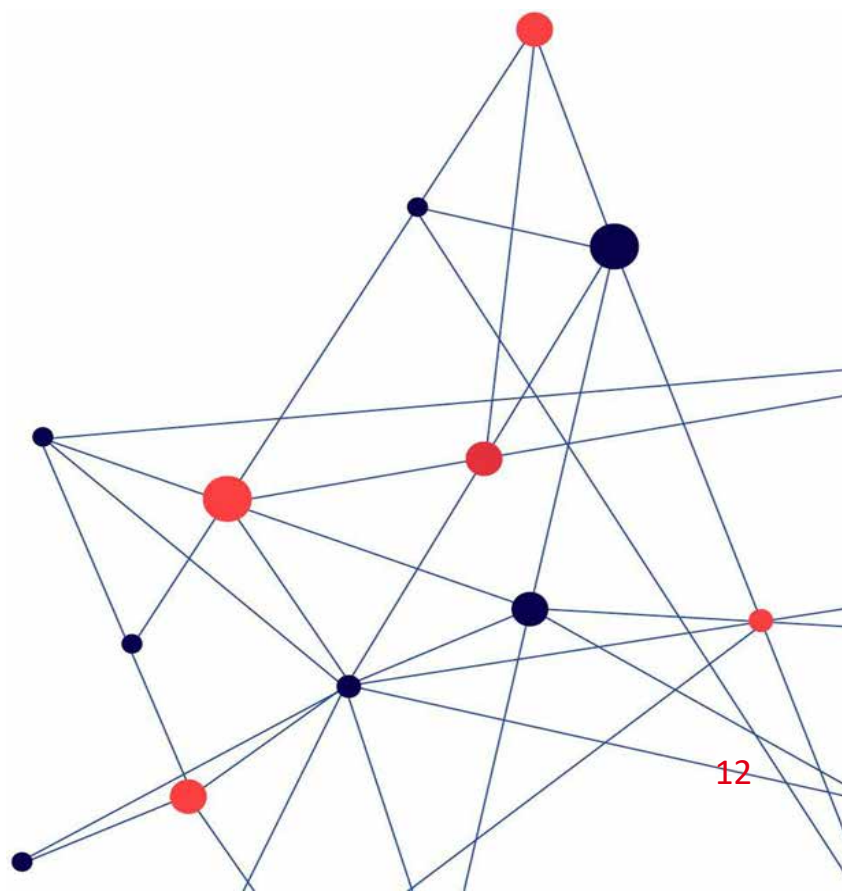
A certification by Intel at three proficiency levels, namely Level 100 (Practitioner Certificate), Level 200 (Professional Certificate), and Level 300 (Producer Certificate), adds a structured framework to the training. That way the training marks a significant stride towards enhancing inclusion and skill development in the field of AI.

7.1 Machine Learning for Earth Observation Training Program

Together with the Rwanda Space Agency (RSA) and the German Aerospace Agency (DLR), GIZ/FAIR Forward implemented a training program for open machine learning for earth observation (ML4EO). Forty young Rwandan professionals were trained and had the opportunity to present their solutions and business ideas at a final pitch event, where they competed for initial seed funding in front of an international jury. The curriculum and training material was developed in cooperation with the University of Rwanda and the Carnegie Mellon University Africa (CMU).

In the past months, the winning teams continued to develop their solutions and business ideas through the availed seed funding. Additionally, an ML4EO practitioners network was launched together with RSA and the created curriculum was made openly accessible for local universities to offer courses in ML4EO.