Instantiation of the Digital Public Infrastructure

The starting point for the discussions[1] was the ambition of the Science, Technology and Innovation for Industry (STII 2025) conference to promote innovation, given the shortcomings of the digital ecosystem and the large number of unconnected people in Ethiopia. Although digital content and solutions are sought after, their implementation is often hampered by social acceptance.

Ethiopia has an ambitious vision, including participation in GIGA, to connect all schools in the country and accelerate the adoption of digital services. However, although there is availability of e.g. mobile networks, affordability is the key issue for large sections of society. The following approach to instantiating digital public infrastructure (DPI) for Ethiopia addresses these shortcomings, which are typical of LMICs.

 The concept focuses on four elements:

- The role of universities in and for society, through Regional Competence Centres (RCCs) to train and use students to connect schools, and make their buildings available for school outreach.
- Mobile operators to support school connectivity through Affordable Access for Education and Health (AA4EDU) and instantiate access through fixed wireless 4G/5G connectivity.
- The Ministry of Education and the Bureau for Education will contribute with their experience in school connectivity and design the solution with GIGA,
- Schools will become the entry point for connecting to Community Learning and Living Labs (CL3), places within the community where residents can perform their digital tasks, women and men can get health information, students can get access for their educational tasks, and everyone can get help with (digital) literacy.

The International contact network[2] AASTU and other Universities is an excellent starting point to instantiate, support, and sustain inclusive access through the DPI.

Guiding question for an inclusive Digital Public Infrastructure

"Shouldn't access to information and services in the digital age be a human right?" is the guiding question for inclusive and affordable access.

Knowing the large number of people who don't have an extra Birr to pay for digital access, the instantiation will be as follows. We will connect up to 10 schools from AASTU using the fixed mobile connection in the 4G/5G network. Although we expect good connectivity, we will set up a school server in each school to provide hands-on experiences, school relevant educational content, a health information package and other add-ons that teachers and school administrators can provide. The installation of a dedicated school server also allows for artificial intelligence through local language models, e.g. spoken content for visually impaired students.

The initial school connection opens the door to connecting the local community and creating a Community Learning and Living Lab (CL3) where all community members can perform their digital tasks.

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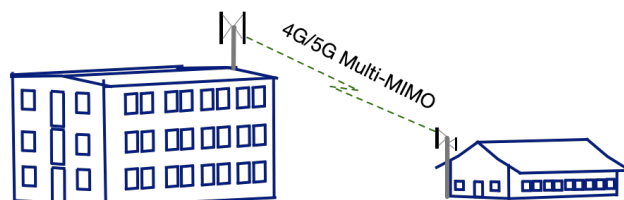
[1] Dr Abraham Debebe, Vice President for Research and Technology Transfer at AASTU, and Prof Josef Noll, UiO are the main contacts for this document

[2] including the NURTURE collaboration with USN and UiO; the Basic Internet Foundation as solution provider; and all other

How is this done today, and what are the limits of current practice?

The current situation is dominated by the fact that Internet access is considered too expensive for the majority of people. There is also a perception among users that the Internet is not useful for their daily lives and that digital solutions are technology and difficult to learn.

Although mobile operators and service providers have connected some schools, the monthly operating costs are considered too high to scale up across the country. The Ministry of Education has launched the e-SHE project to promote digital content in education and has equipped all public universities with a multimedia room to create digital content together with training academicians, but has not yet reached out to schools. The cooperation with the universities will promote exchanges and thus increase the participation of schools in the creation and use of digital content.

The challenge for federal and regional governments is that digital services aren't accessible to everyone. Through CL3, we are creating opportunities for members of the community to learn about the benefits of information and services on the web.

Health information is currently provided in an analogue form, while the school server allows for targeted information, e.g. on "removing the stigma of menstruation. "

Success criteria and sustainability

Vodacom's offer in Tanzania of unlimited SIM-based fixed wireless connectivity at 10 Mbps for 60 kTZS (~US$22) addresses affordable access for schools and health centres. We are confident that operators in Ethiopia will see the opportunity for AA4EDU to educate future customers to become individual customers.

The key success criteria is to demonstrate affordable access that can easily be extended to nearby schools and CL3s. Once we have demonstrated the success of the solution, we have instantiated the access part of the DPIs. The risks in this approach are related to sufficient knowledge of all partners, insufficient regulations and the ability of schools to generate e.g. USD 20 per month.

We expect the mobile operators to build a 4G/5G tower on the roof of an AASTU building. The students will then learn how to install the equipment in the vicinity schools. The Basic Internet Foundation (Norway) has received a donation of 4G/5G receiving antennas for this first phase, and together with partners has implemented more than 250 schools in countries in East Africa. The hardware cost is around USD 200 per school and the infrastructure is scalable to other countries.

Therefore, we invite all partners to join and instantiate the Digital Public Infrastructure for Ethiopia.