UiO : Department of Technology Systems
University of Oslo

NGINO

NGINO project workshop, 29 Nov, Kjeller

Connecting the Unconnected: Cloud vs distributed cloud - making the case for Africa

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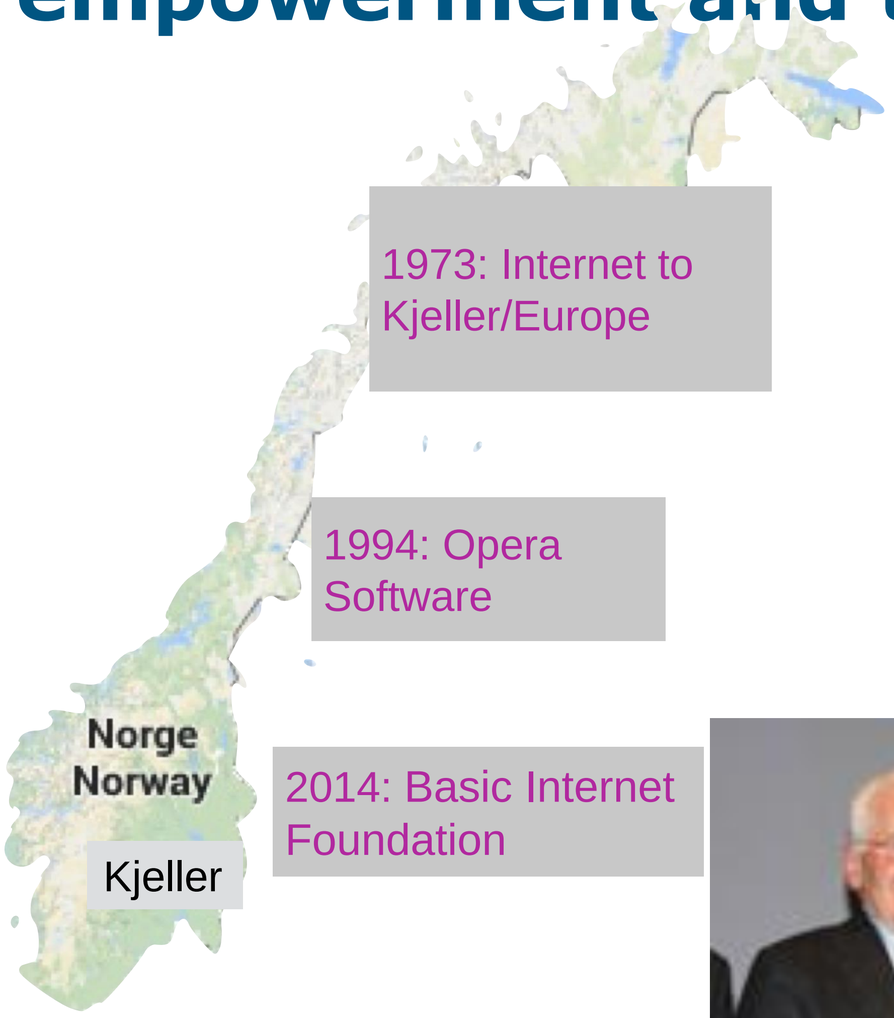
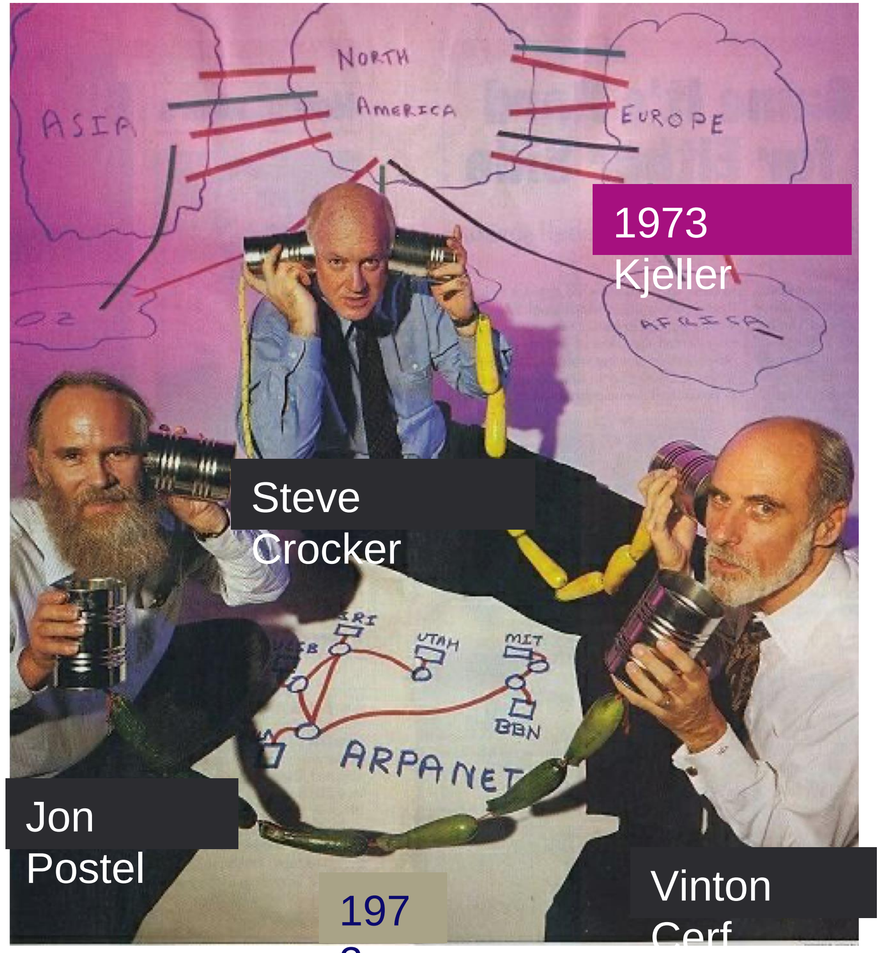
Next Generation Internet as basis for empowerment and trust



1973: Internet to Kjeller/Europe

1994: Opera Software

2014: Basic Internet Foundation

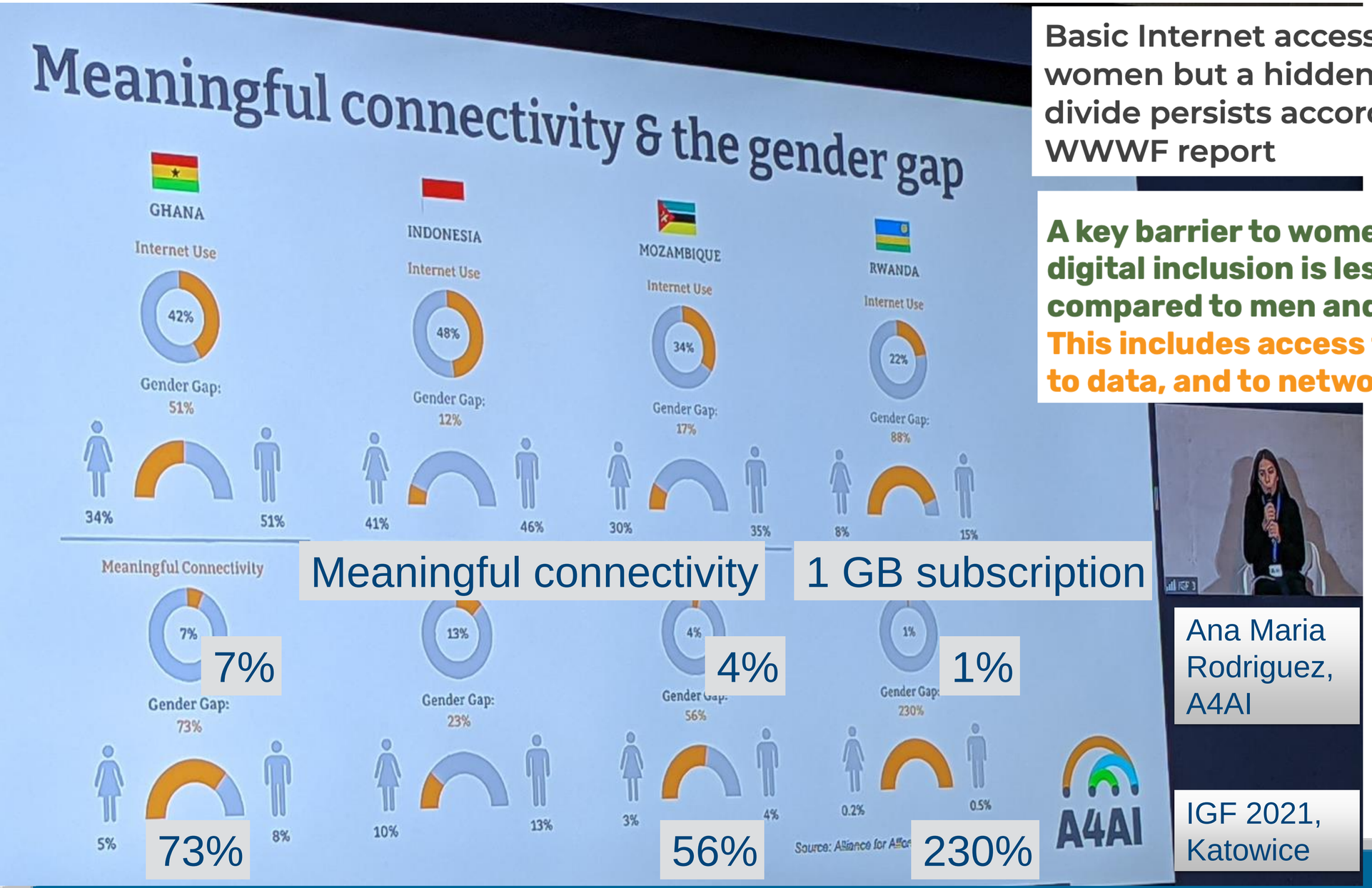


Source: http://www.michaelkaul.de/History/history.html

The building blocks for Digital Empowerment

"Our vision is
to improve the life of **every human**
through **free access to information** on the Internet…."

Reality in Africa



Basic Internet access is improving for women but a hidden digital gender divide persists according to new WWWF report

A key barrier to women and girls' digital inclusion is lesser access, compared to men and boys.
This includes access to devices, to data, and to networks.

Meaningful connectivity

1 GB subscription

7%

4%

1%

73%

56%

230%

Ana Maria Rodriguez, A4AI

IGF 2021, Katowice

Must secure affordable meaningful connectivity

The high cost to connect is excluding billions from the digital revolution:

Nearly **half of the world's population is still offline**

And a significant percentage of those online have unreliable and poor connections.

We have meaningful connectivity when we can use the internet every day using an appropriate device with enough data and a fast connection.

Source: Eleanor Sarpong, A4AI, Mar2021

Addressing the Challenges of an Inclusive Internet

Norwegian Ministry of Foreign Affairs

Summary

Meld. St. 11 (2019–2020) Report to the Storting (white paper)

Digital transformation and development policy

https://www.regjeringen.no/no/dokumenter/meldst11_summary/id2699502/?ch=1

- Access for meaningful connectivity
- Skills: digital literacy and local content
- Regulations:
- Inclusion: Gender divide “boys have the toys”

Beyond infrastructure:
Complementary initiatives are needed to connect people already covered by broadband networks. These include programs to increase and support **device affordability**, **affordability of data and services**, **digital skills programs and content**, with a special focus on **closing the digital gender gap**.

Scalable connectivity

for meaningful access
tailored towards the needs & capabilities

Self-actualisation
Entertainment

Empowerment, Work
Digital Transformation

Explore, Affection
Opportunities

Value creation
Trust & confidence

Mobile Broadband
20 USD/month/person

Community network
50-100 Mbps
200-500 USD/month

Narrowband
~5 Mbps
58 USD/month

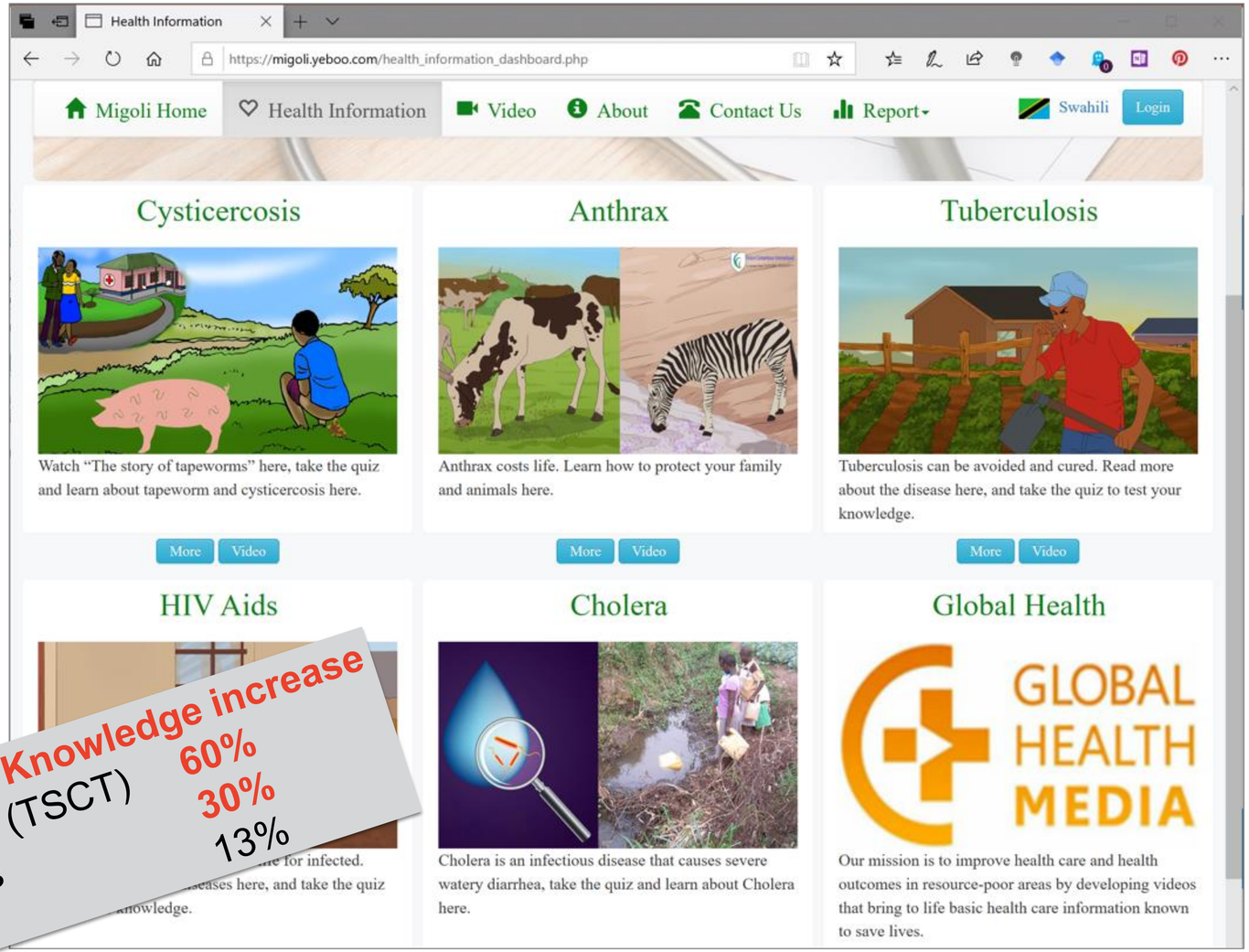
InfoSpot
10 GB/month
<20 USD/month

Village/Community Portal Skills & Value for the Community

Village server with locally stored information on health care etc.

The website will contain locally stored information on

- Health
- Entrepreneurship
- Education
- Agriculture
- Financial inclusion (e.g. via Women Community Centers)



Results in TZ: Knowledge increase
Cysticercosis (TSCT) 60%
Tuberculosis 30%
HIV/AIDS 13%

Bishop Okoth Girls Mbaga Sec
1 750 girls

Ulafu Mixed Sec
450 girls & boys

Obama Mixed Secondary
550 girls & boys

Malele Mixed Sec
575 girls & boys

Siaya county

Kisumu county

Ratta mixed sec
780 girls & boys

Ratta mixed sec
780 girls & boys

45 schools,
27501 students connected Sep/Oct 2021

Kolweny Kingsway Sec
342 girls & boys

Bishop Linus Okok Girls
High School, 1660 girls

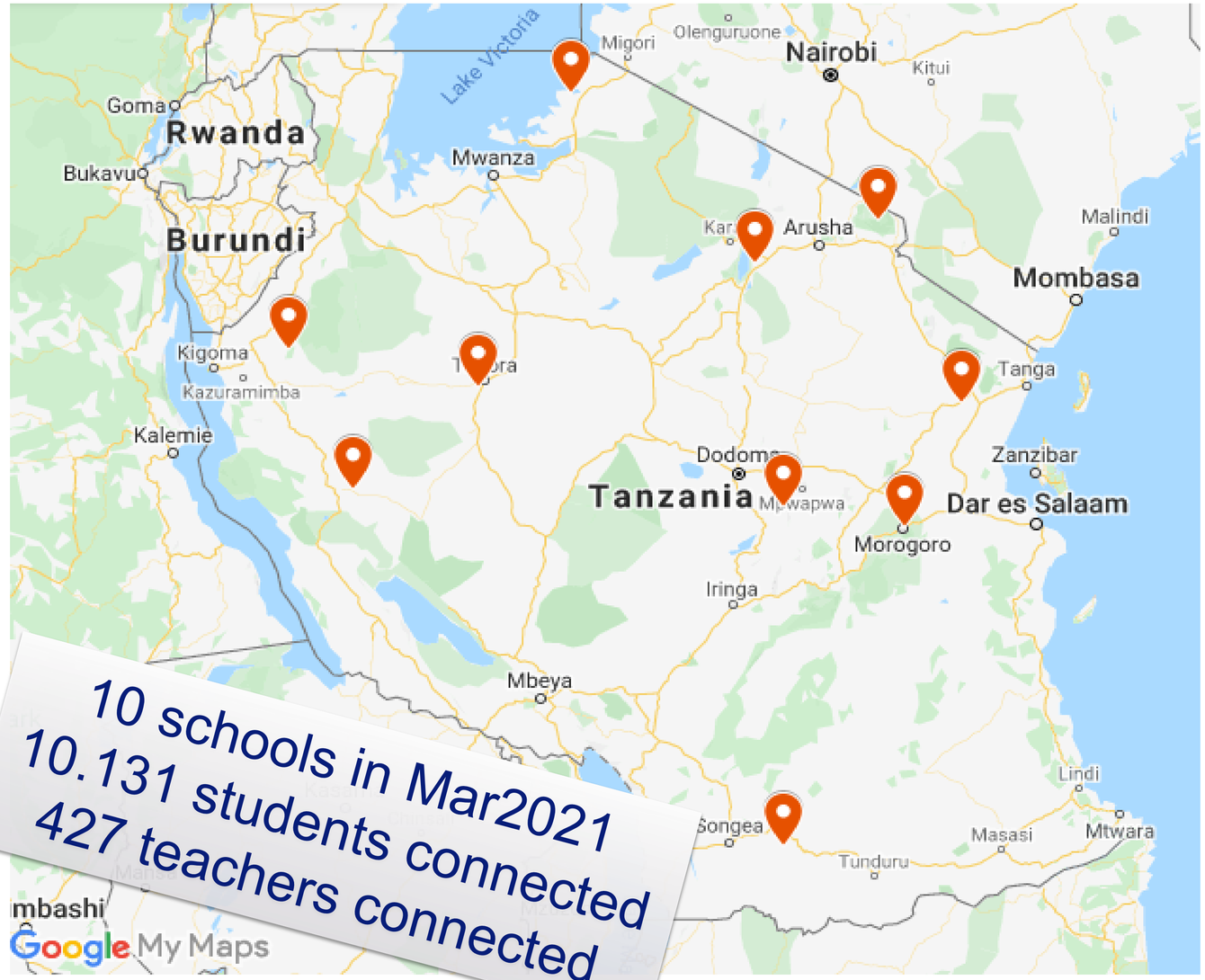
St. Paul Oriang
380 boys & girls

Homebay county

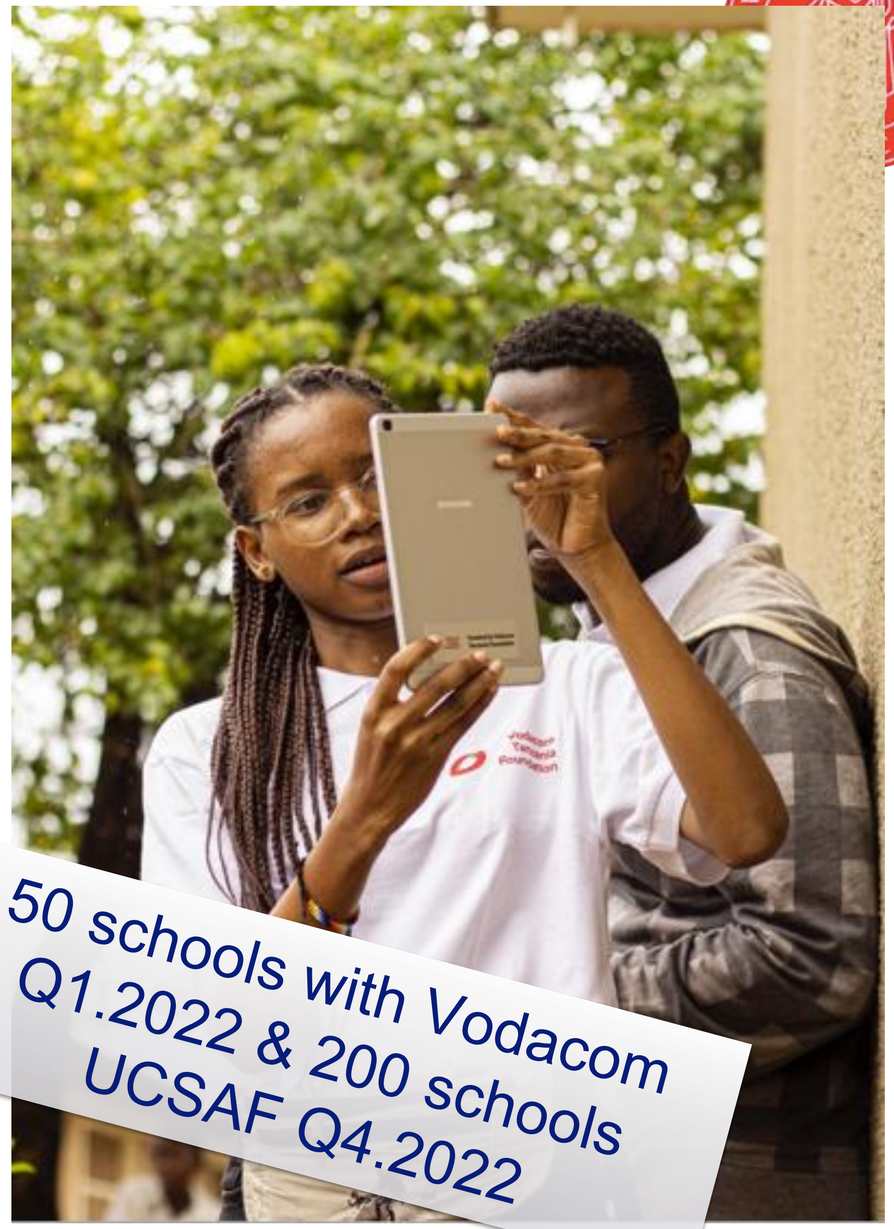
sponsored by our
premium partner

DENT

Scale-up Tanzania
Catherine connects schools



10 schools in Mar2021
10.131 students connected
427 teachers connected



50 schools with Vodacom
Q1.2022 & 200 schools
UCSAF Q4.2022

Source: Eleanor Sarpong, A4AI, Mar2021

Policy actions to tackle digital inequality

Increase partnerships to fund infrastructure & encourage new connectivity models

- Shared Rural Network
- Connecting Europe BB fund
- Community networks

SRN -£1bn joint initiative *between UK Gov. & UK's 4 mobile network operators to extend overall 4G coverage to 95% of the UK landmass by Dec 2025.*

Connecting Europe Broadband Fund (CEBF)- *Expected EUR 550- 600 (June 2021) - so far, invested in seven very-high capacity network projects in rural and semi-rural areas across*

Cooperatives: *Guifi.net Catalan/Spain*

Push for Targeted interventions on access and skills

- vouchers
- social tariffs
- Subsidies

WiFi4EU Programme- *A voucher of €15,000 is granted to municipalities to install free public Wi-Fi in public spaces.*

EC €200m voucher scheme for Italy *Helps low-income families buy high-speed broadband services (download speeds of at least 30 Mbps) & devices*

Grand Ecole du Numérique, - *Inclusive Digital talent accelerator; provides subsidies for ICT skills training*

Improve Inclusive Data Collection for policy planning

- New and improve data sets to monitor digital inclusion across user groups, gender, geography, race, etc.

Collaboration across statistical agencies and EuroSTAT on inclusive data sets and indicators *Consider data to track access and use by traveler communities, migrants, refugees, senior citizens, young people, persons with disabilities, rural populations*

Establish clear monitoring and evaluation of projects and programs *Including those focused on digital skills.*

Sources- Europa, A4AI, OECD , WEF. OFCOM

Conclusion

NGI for an empowered society- Road model

Differentiate the digital pedestrians from the digital cars.

- The pedestrians surely use near zero bandwidth,
- but nevertheless need access to the internet through a user device and a local loop;
- This issue of marginal and average costs is called the bridge problem by economists;
- If crossing the bridge is free, who pays for the bridge?
- We think that development and time will solve this problem but not at a speed that
- satisfies us (The Digital divide will no wait)
- Subsidies, education, technical assistance will have a cumulative effect.

Cloud vs distributed cloud - making the case for Africa

Paper to be presented at the March 2023: IEEE Society for Social Implications of Technology (SSIT) and IEEE South Africa

Jonathan Muringani (UiO), Josef Noll(UiO), Lerato E. Mdaka (North West University, South Africa) , Sudhir Dixit (USA) and Danica Radovanovic (Serbia)

Cloud (centralised with CDN networks) vs distributed cloud

- Africa and the challenge of access new Internet:
- Hotspots in every school and village, freemium model
- Democracy, health, education, trustworthy internet

Business case: Cloud vs Distributed cloud

- Cloud: centralised and CDN is favourable because people are paying for the access.
- Example Norway: Internet penetration, const contribution : 35 USD/month - total cost of ownership?

Vs

- Decentralised cloud: InfoSpot with free access and freemium model for Africa
- (but Who pays?- Digital Public Goods).

Empowerment of Society- Community learning living labs (CL3)

- Virtual meeting point InfoSpot becomes a physical meeting point
- Point for talking and discussing