



UiO  **Department of Technology Systems**
University of Oslo

Elektrofagdag OsloMet - 30Oct2020

Digitaliseringens bidrag til en bærekraftig utvikling og klimautfordringer

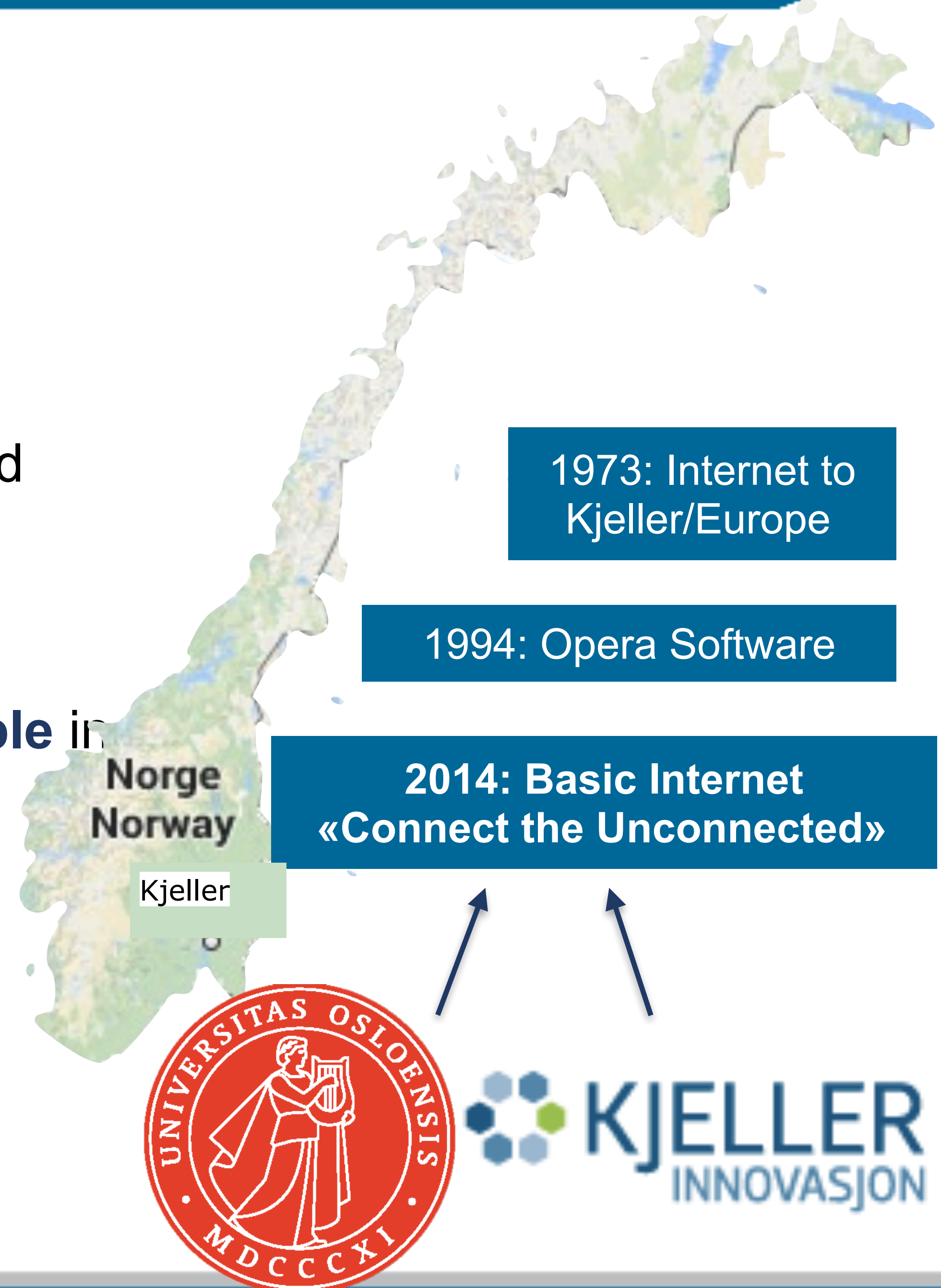
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About the Basic Internet Foundation

- **Information** is the **basis** for **education, health** and entrepreneurship
- **Digitalisation** is the engine of **economic growth** and wellbeing of people
- Sustainable development requires **digital inclusion**, which necessitates Internet for all
- **Impact** lives of the **unconnected** 3.5 billions of **people** in world
- **University of Oslo** (UiO/UNIK) and **Kjeller Innovation** co-founded the Basic Internet Foundation
 - “**Internet Lite for all**”
 - free access to information for all



United Nations Sustainable Development Goals

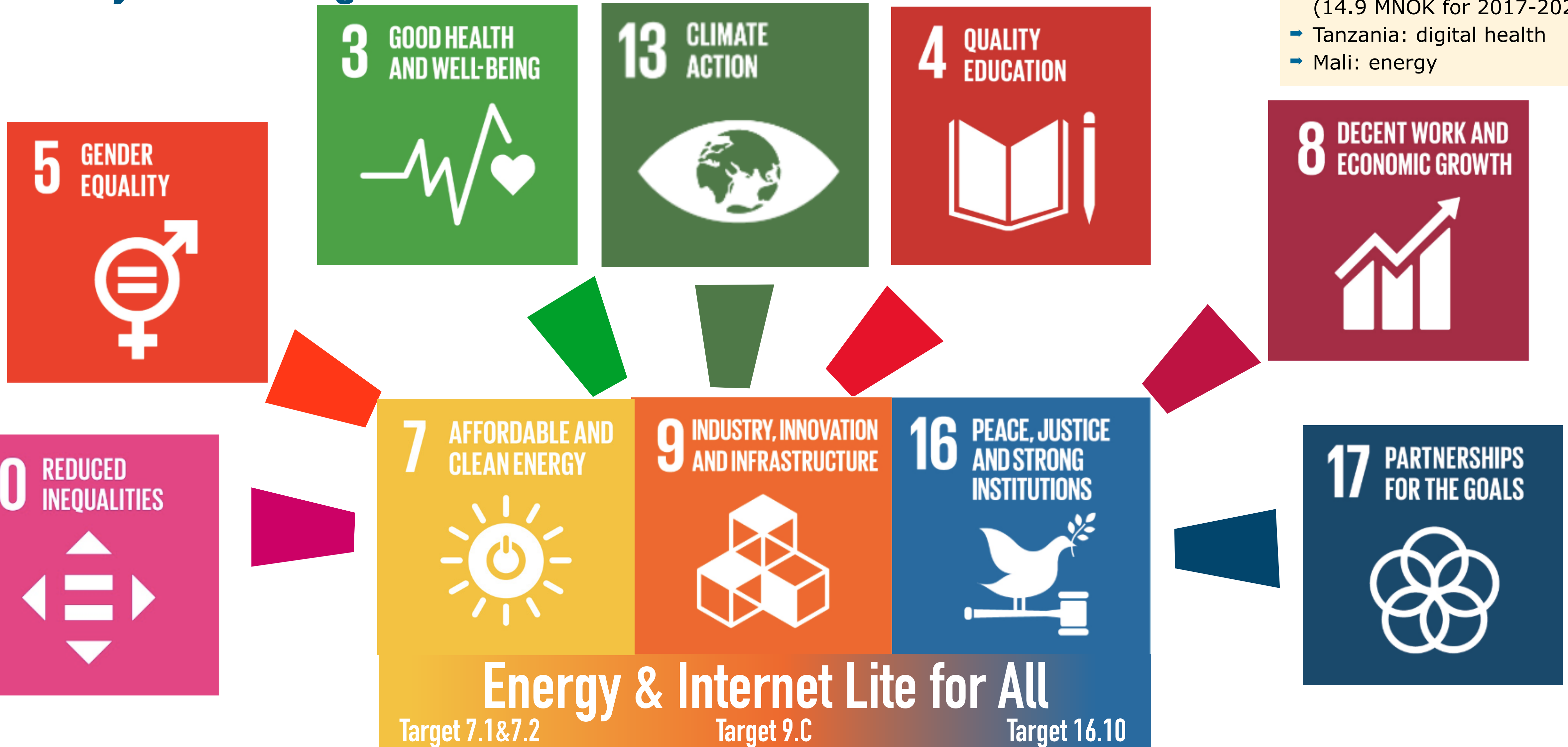


Affordable Energy & Internet Lite for All

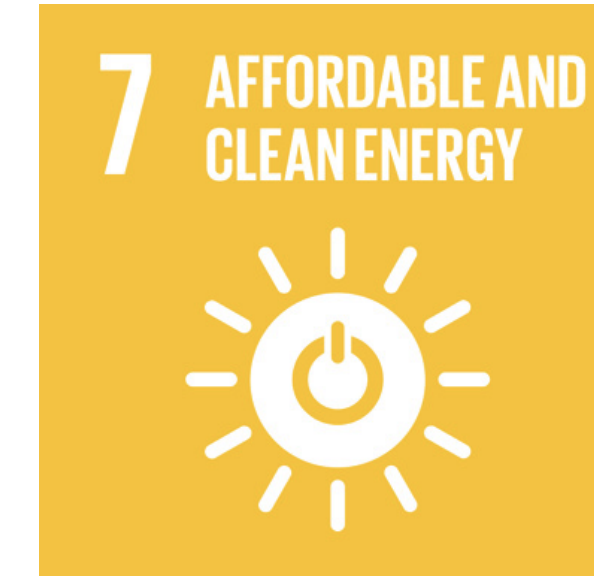
the catalysts for the goals

Showcase
“*Non discriminating access*”
project

- funded by RCN and Mfa/Norad (14.9 MNOK for 2017-2020)
- Tanzania: digital health
- Mali: energy



SDGs addressed by B5G and 6G



- SDG 9.C:
Significantly increase access to information and communications technology and strive to **provide universal** and **affordable access** to the Internet in least developed countries **by 2020**
- SDG 16.10:
Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements with
 - 16.10.2 Number of Countries that adopt and implement constitutional, statutory and/or policy guarantees for **public access to information**.
- SDG 7.1 By 2030, ensure **universal access** to affordable, reliable, and **modern energy** services
- SDG 7.2 Increase substantially the **share of renewable energy** in the global energy mix by 2030
- 7.b By 2030, expand infrastructure and **upgrade technology** for supplying **modern and sustainable energy** services for all in developing countries, particularly LDCs and SIDS

Public Opinion on SDGs (afrobarometer.org)

- Priorities by people in Africa
- decent work
 - zero hunger
 - good health
 - ...



Public Opinion on 5G

- 5G - opinion by people
 - convenience <-> privacy,
 - national competitiveness <-> national security
 - speed <-> price
- need to have? 0% ?
- nice to have? 5% ?
- Opinion: no contribution to SDGs

<https://www.politico.com/news/agenda/2020/02/25/poll-5g-what-do-people-really->

THE 5G FUTURE

The 5G World: What People Care About

The coming fast wireless network will require policy tradeoffs, from convenience to national security. In a new survey, we asked citizens what they really value.



Illustration by Sam Chivers | Graphics by Andrew McGill

By JOHN HENDEL

02/25/2020 04:30 AM EST



A

round the world, 5G is a buzzword, a sales pitch—and, increasingly, a policy challenge.

Reality of the Digital Divide

→ “Boys have the toys”

- digital divide in both devices
 - Example Smartphone ownership: 33% male, 16% female (Bangladesh)
- mobile broadband access

→ Costs of Access

- School connectivity (SDG indicator 4.A.1)
 - TZ: ~3% of schools are connected to Internet
- Digital Health for primary health facilities
 - <1% of primary health facilities have Internet (TZ)
- Community involvement/digital transformation

“Internet had the ability to dismantle the divide. Internet failed miserably, the divide is bigger than ever.”
Kate Gilmore, Human Rights, UNO

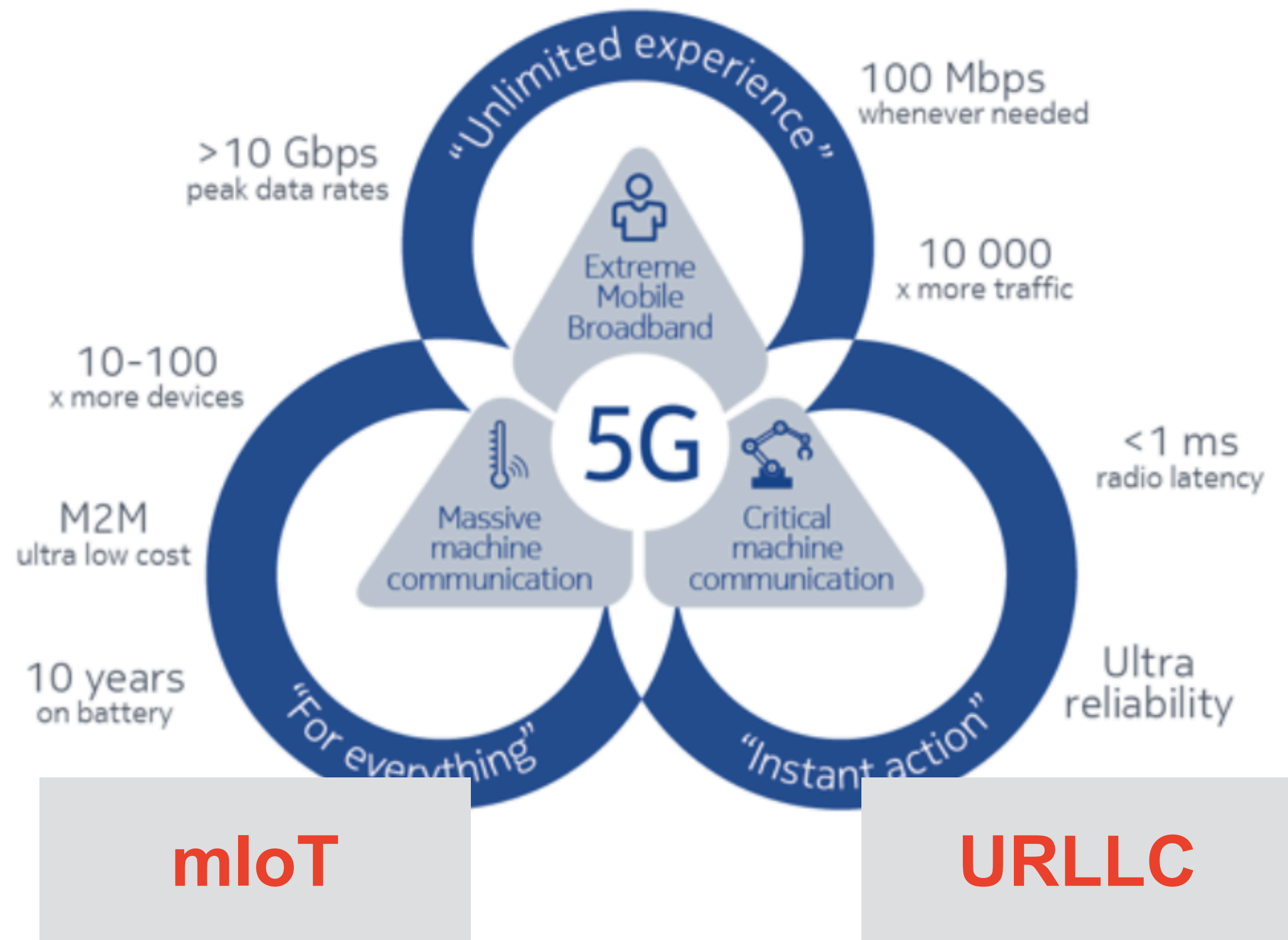
CAPEX

OPEX



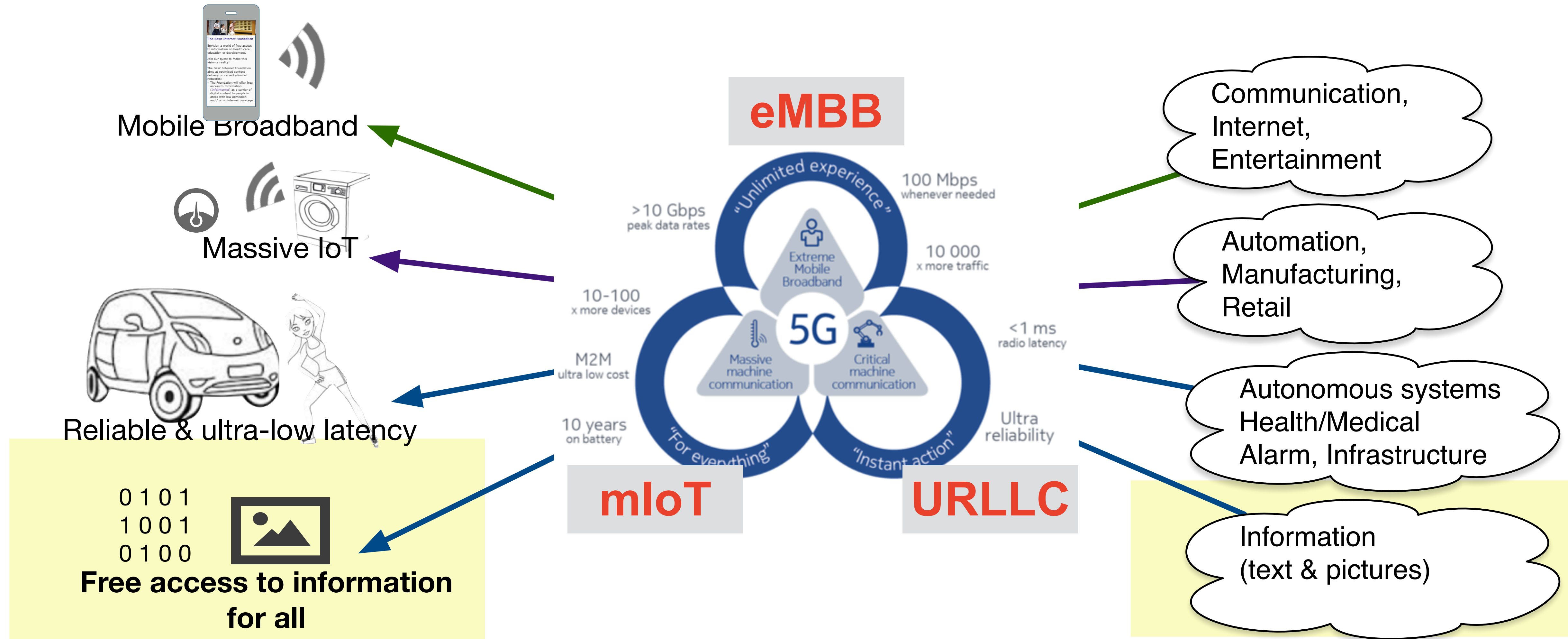
5G: Industrial Challenges

- enhances Mobile Broadband
- massive IoT
- ultra Reliable, Low Latency communication



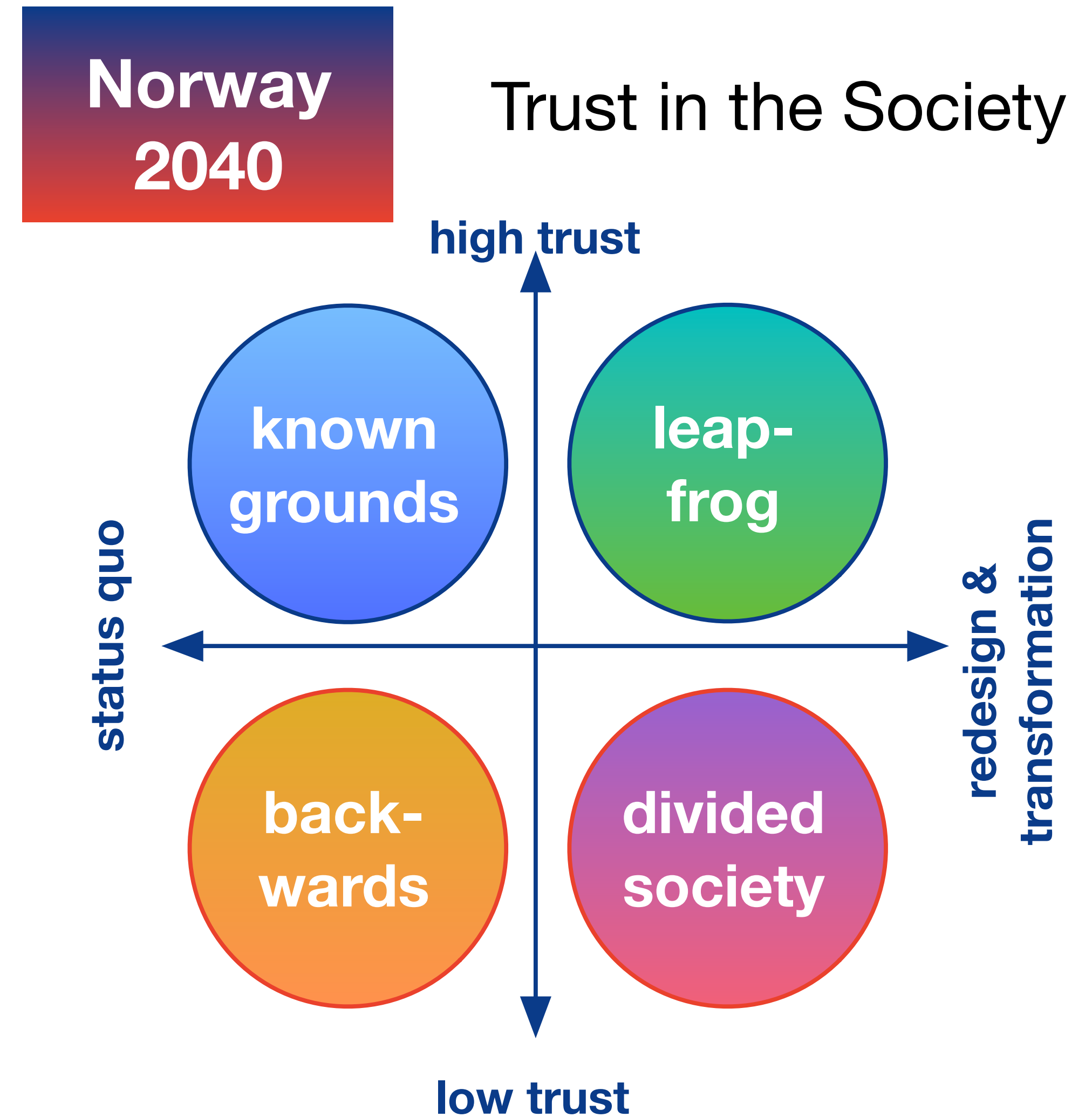
[source: Nokia <https://networks.nokia.com/5g/get-ready>]

5G network slicing for Free Access to Information for All



The main reasons for 6G

- Societal Security
- Trust in Society
- 6G and SDGs



6G

Marja Matinmikko-Blue: Overview of new 6G white papers

Volker Ziegler: 6G technology and architecture – unify experience across the worlds

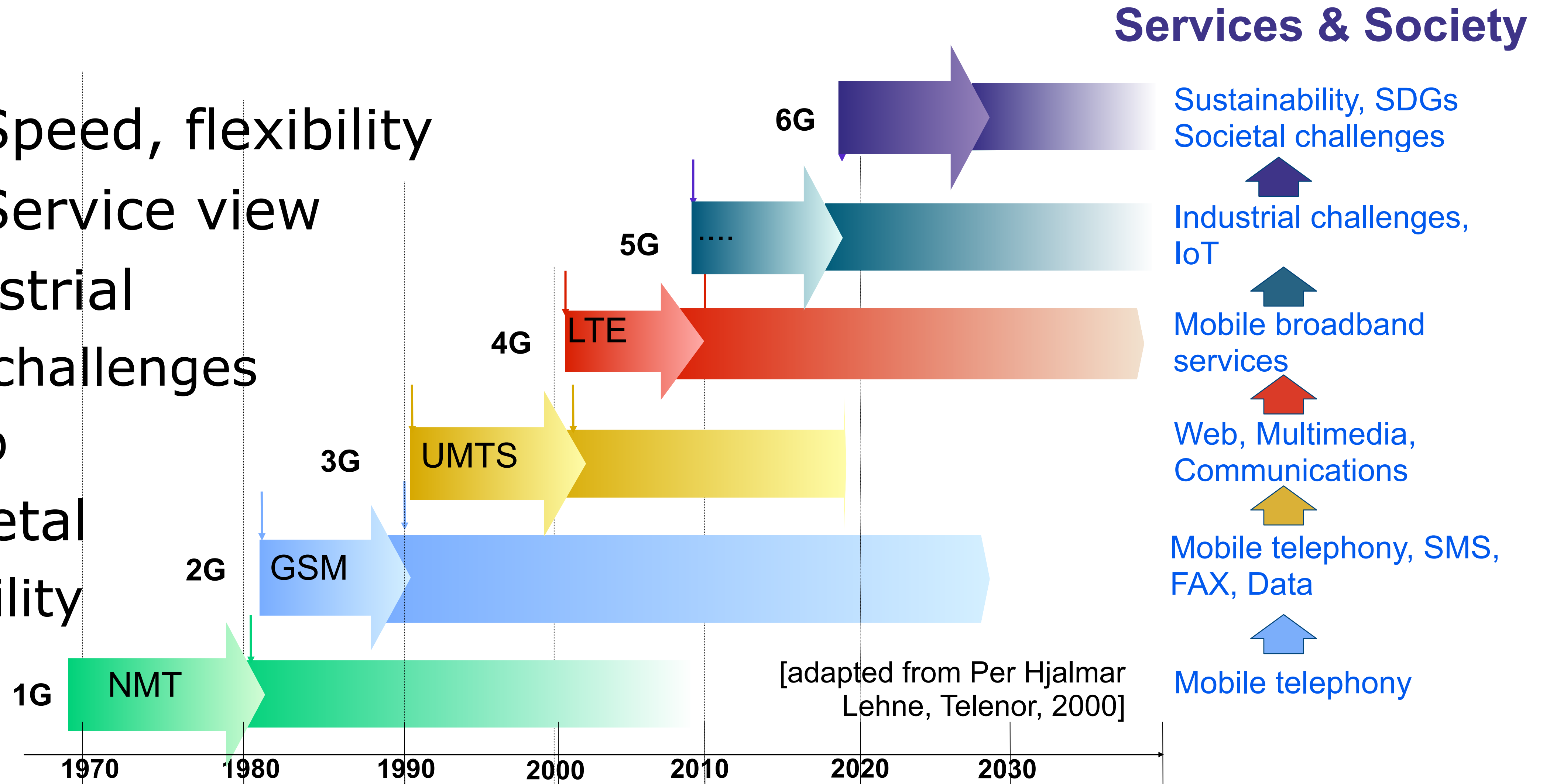
Josef Noll: Digital inclusion and the freemium model for access to information for all

Marianne Kinnula: Megatrends shaping sustainable development of 6G

Panos Kostakos: Linking 6G and UN SDGs

6G: Digitisation of the Society

- 1G-3G: Speed, flexibility
- 3G-4G: Service view
- 5G: Industrial
 - Business challenges
 - ownership
- 6G: Societal
 - sustainability





Addressing the 3.5 billion people not connected to the Internet through 6G

- Government of Norway Report - **Priorities**
 - Access, skills, regulations, inclusion
- “Boys have the toys”
 - digital divide in both **devices**
 - and **mobile broadband** access
- **Costs** of Access
 - School connectivity (SDG indicator 4.A.1)
 - Digital Health for primary health facilities
 - Community involvement/digital transformation

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

Digital transformation and development policy

Access

Skills

Regulations

Inclusion



Providing 6GforAll

- ➔ **Free access to Information** (Internet Lite)
 - 1) Access - one **Information Spot** per village
 - 2) Skills - Health, Education, Agriculture
 - 3) Regulations - Freemium model
 - 4) Inclusion -
Free access for all #LeaveNoOneBehind
- ➔ Internet Lite & **Freemium** model for access
 - **free access to National Knowledge Portal** for all
 - **premium** access to **broadband**
 - sustainable solution

+18 dB
>20 km

“Providing Internet to the basic of the pyramid isn't a question of affordability, but rather a question of sustainability”
Internet Governance Forum, Panel, WIN

At least
one **Information Spot**
per village

Societal areas of focus

- **Digital Knowledge portal** initiative
- Open source software and content (Pro-Digital Public Goods - DPGs)
- Multimedial content strategically tailored for target groups and communities
- Educational programs and trainings
- Empowering and fostering 21st century digital skills



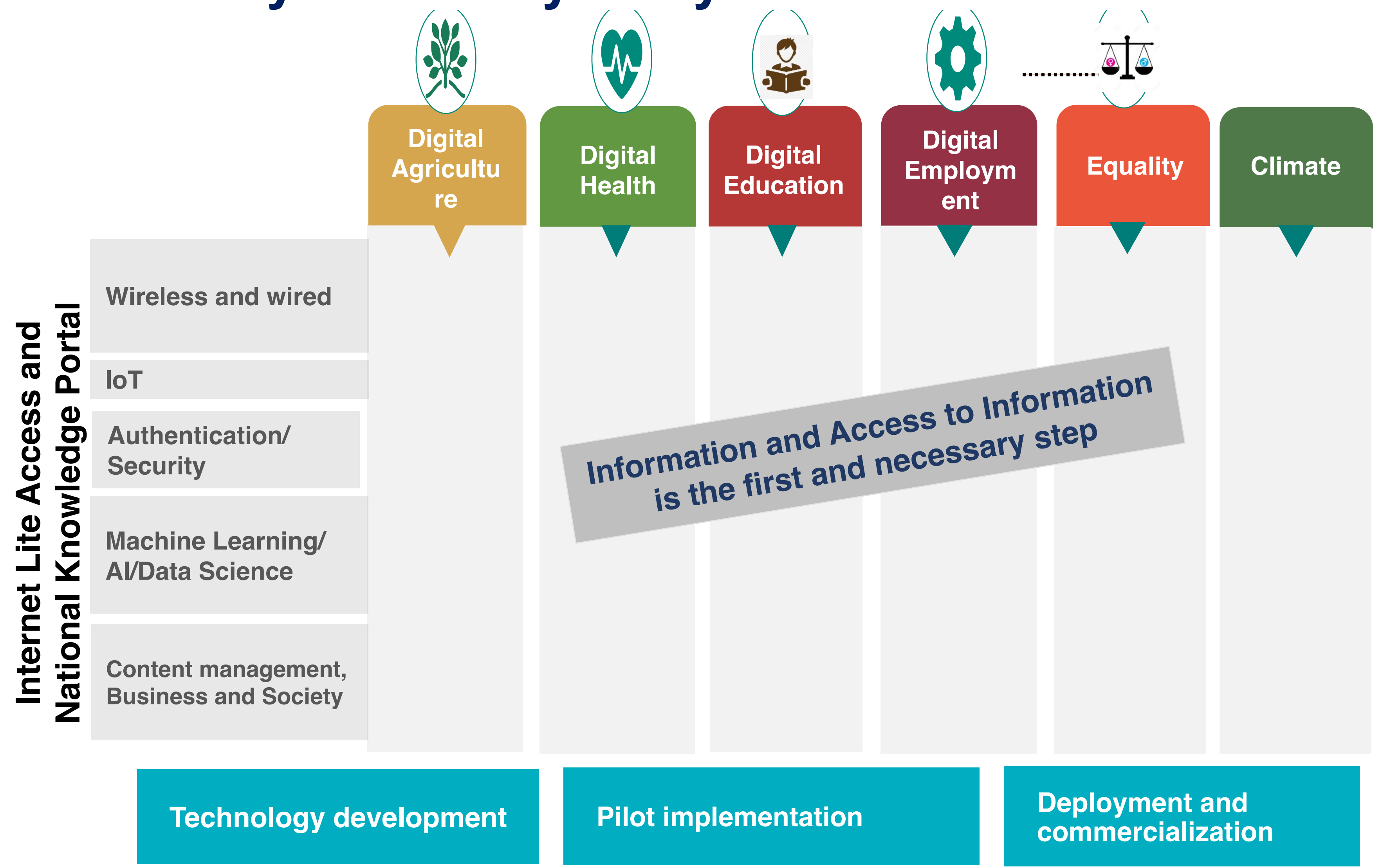
Societal goals: “leave no one behind” and social inclusion through digital -> mission.

We focus on:

- - vulnerable groups, girls and women, bridging the gender gap
- - discriminated groups in the society
- empowering people in rural areas, semi-literates and illiterates,
- empowering women businesses



Examples: Address real-world challenges of connectivity and access to information for everyone and by everyone

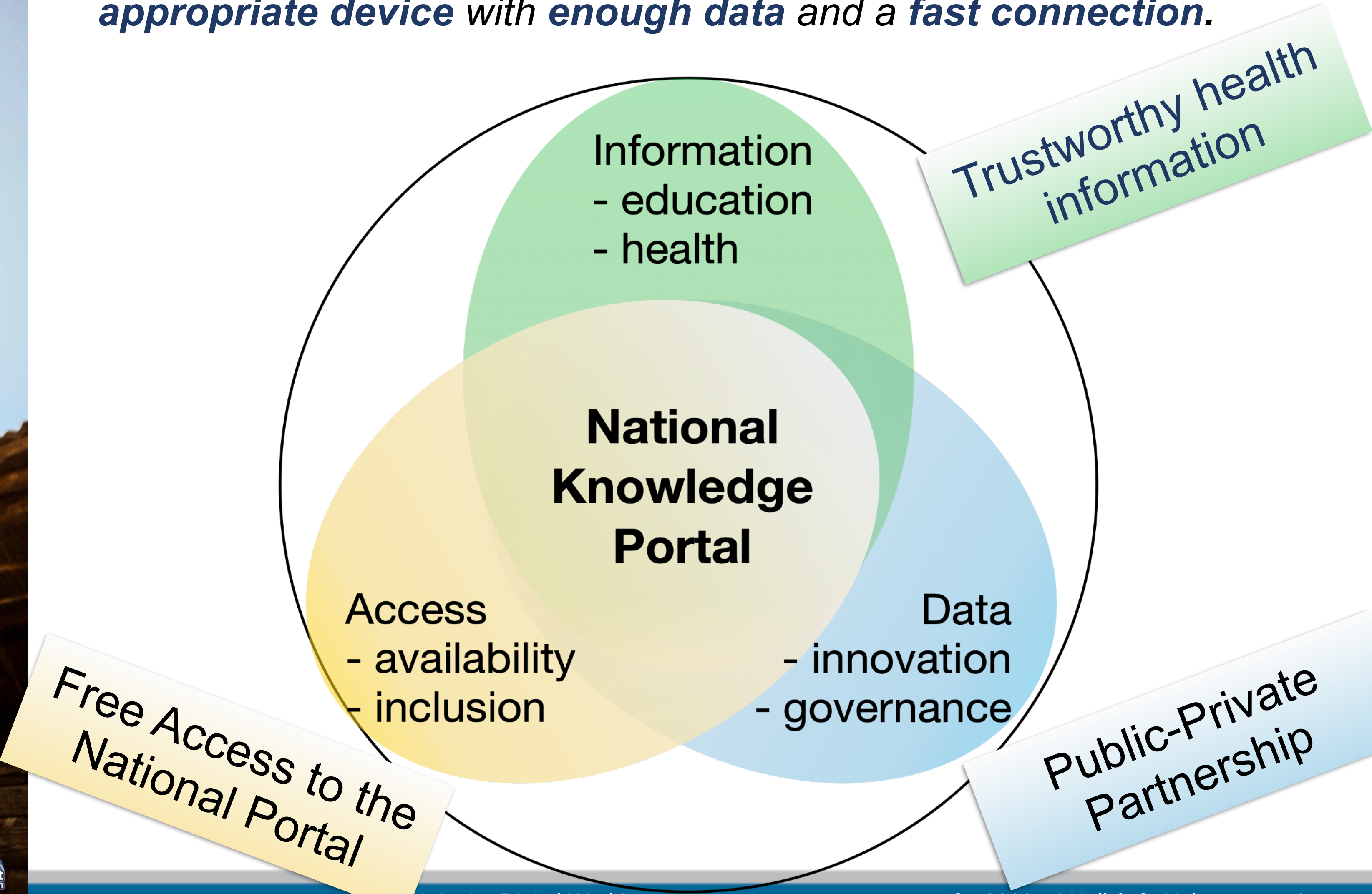


"interdisciplinary projects with social impact with sustainable business models"

Free access to information as catalyst for the SDGs a Digital World through Innovations & Collaborations



*Meaningful connectivity to the Internet and **skills** for using an appropriate device with **enough data** and a **fast connection**.*



Addressing Education 5.0 and Global Challenges

- Cognitive skills
 - literacy and numeracy
 - critical thinking
 - problem solving

Edu 3.0

- Social and emotional skills
 - empathy, teamwork
 - leadership, cultural awareness
 - fraternity & social friendship

Edu 4.0

- Global challenges
 - Climate, Sustainability (SDGs)

Edu 5.0



It's easier than we think....

1) Building an InfoSpot in every village

- ➔ Receive antenna
- ➔ Local network controller
 - “Internet Lite”
- ➔ Village Server
 - Raspberry Pi



2) Providing the information through animations

Snapshots from platform, HIV and Cysticercosis animations



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

[Source: Christine Holst, UiO (Nov2019)]

3) Provide “Internet Lite” and the Freemium Model

free: Lightweight Protocols & premium: for broadband

<https://basicinternet.org/internet-lite-to-the-migoli-high-school/> <https://basicinternet.org/internet-lite-to-the-migoli-high-school/amp/>



MISSION PROJECTS ABOUT PARTNERS MEDIA

Full Web experience

INTERNET LITE TO THE MIGOLI HIGH SCHOOL

By josef | 4 May 2019 | Uncategorized

The Migoli High School has 1271 pupils (Apr2019) and 35 full-time teachers. The high school is located about 3 km outside of Migoli in the Iringa district in Tanzania.



Basic Internet Foundation



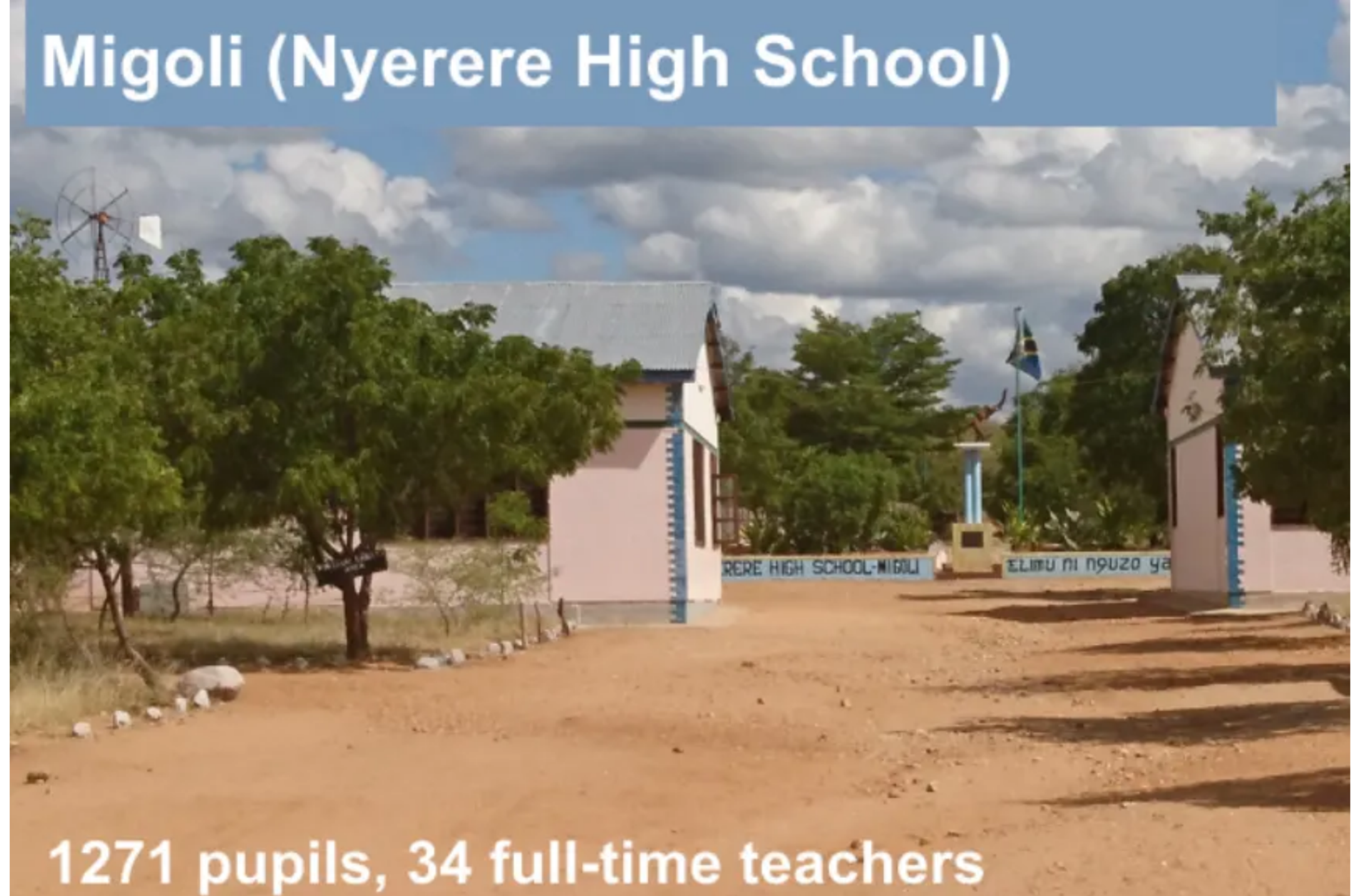
Internet Lite - AMP experience

8 months ago

Internet Lite to the Migoli High School

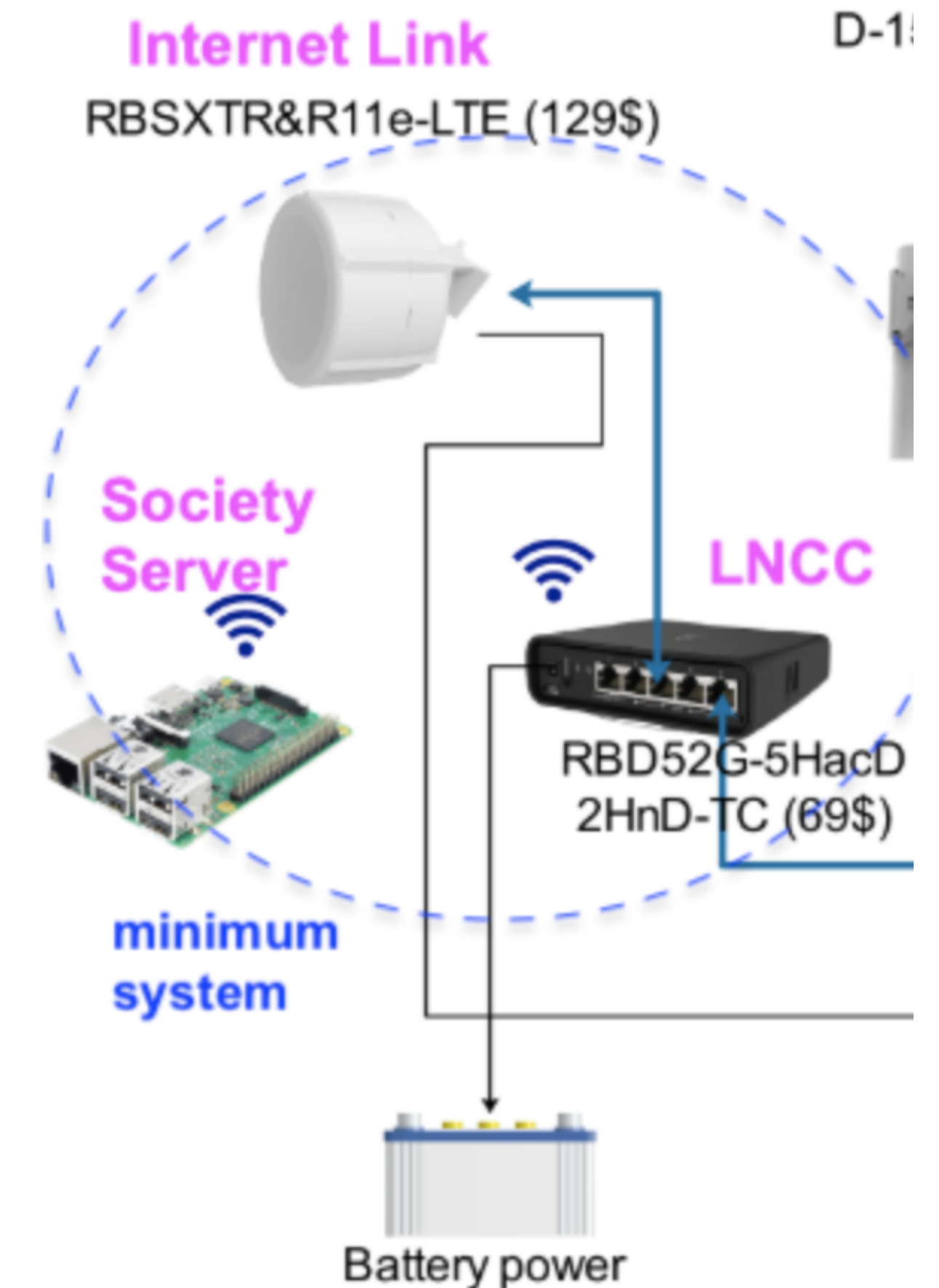
josef

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1271 pupils, 34 full-time teachers

Invitasjon - la oss digitalisere verden sammen



Konkret - vi hjelper med konnektivitet og reiser til utveksling

- ➔ Elektrofag
 - bygge og konfigurere InfoSpot (4.500 kr)
 - tar "eierskap" for donasjon til en/flere skoler
- ➔ Informasjon
 - samarbeide for "Village Portal"
- ➔ Gjennom Norad kan noen elever reiser til utveksling
 - Kenya (AHERI), Tanzania, Ghana



Catherine R. Kimambo, "African Child & Basic Internet"