6G Wireless Summit 2020, Levi, Finland (virtual)

6G for Digital Inclusion and Sustainable Development

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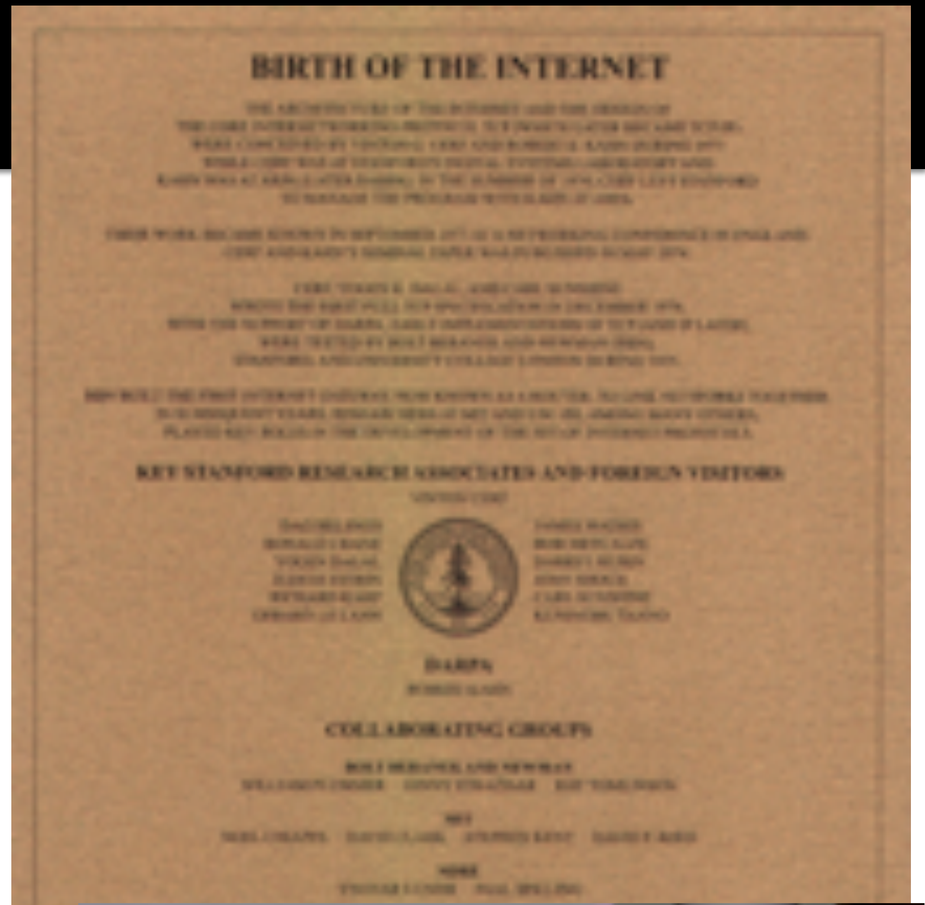
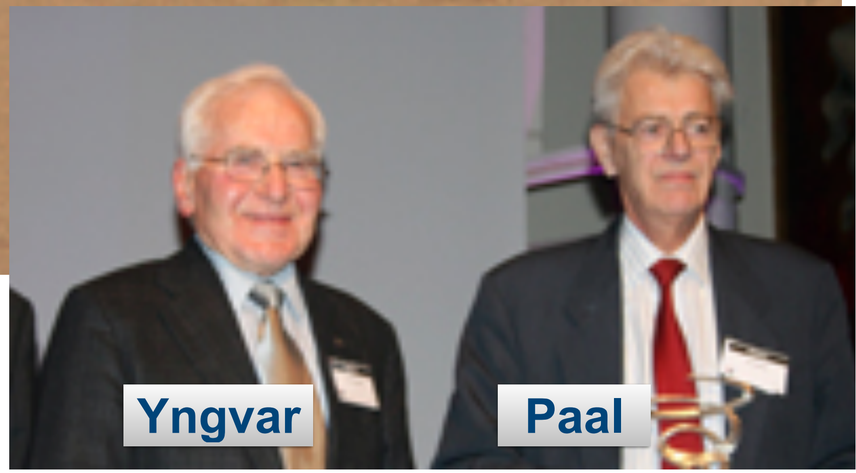
"The last time I was connected by wire was at birth"

- The Nordic Perspective
  - From 1G to 5G (6G)
  - From Internet to Societal Empowerment
- Grand challenges
  - Societal Security,
  - Resources, Climate
  - "The Divide"
- Sustainable Innovation
  - Digital Inclusion
  - Return on SDGs (RoSDGs)
- Conclusions

The Internet and the Nordics

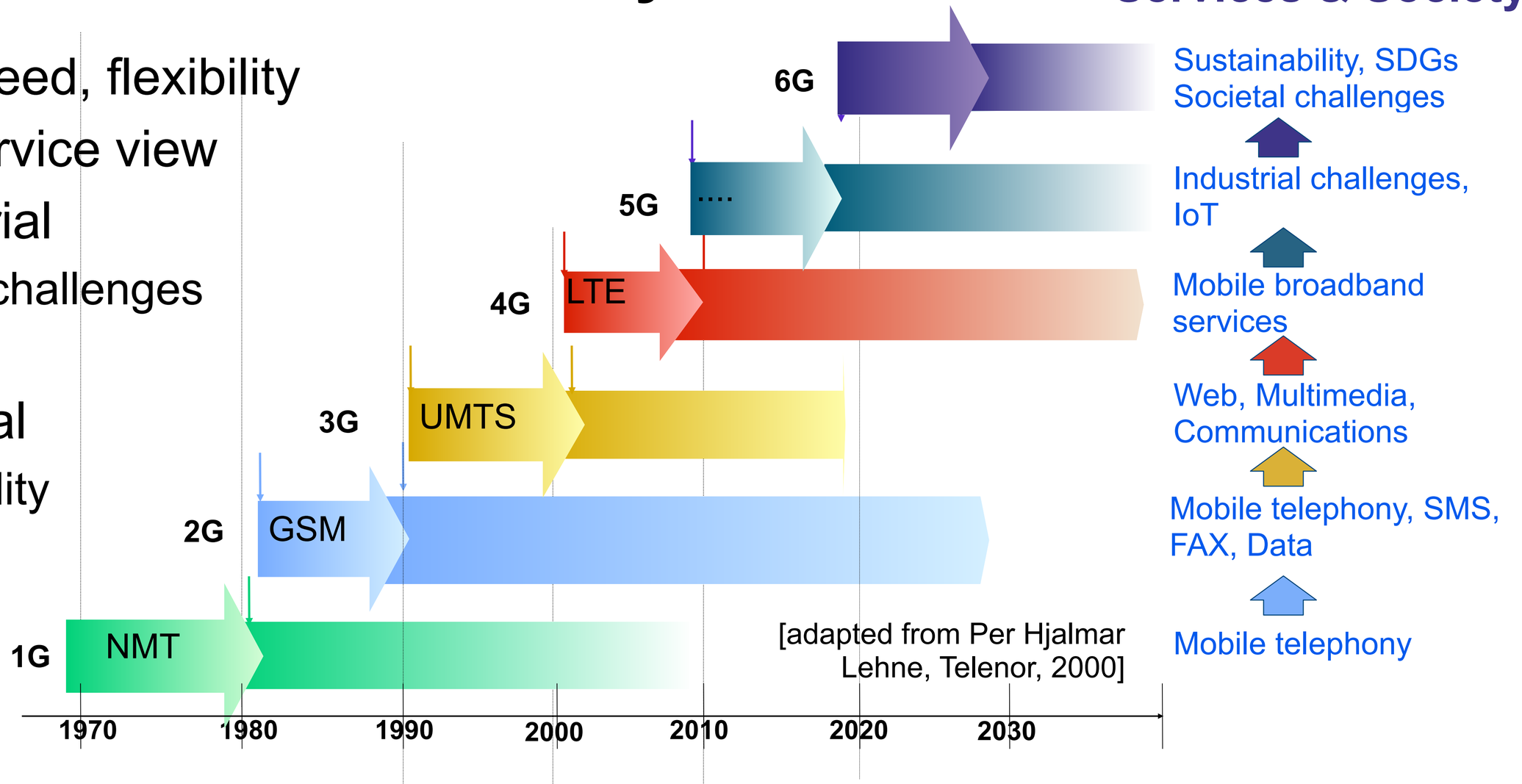
- First Arpanet Connection to Kjeller (June 1973)
  - (except Hawai)
- List_of_Internet_pioneers [Wikipedia]
  - Yngvar Lundh, Paal Spilling
- Anwendungsentwicklung
  - .php, OpenSource, Linux, Skype, Spotify
  - OperaSoftware, FAST Search
  - Nokia, Ericsson
  - Telenor, TeliaSonera
- Mobiles Internet:
  - GSM
  - Mobile Anwendungen





6G: Digitisation of the Society

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



5G network slicing for Free Access to Information for All

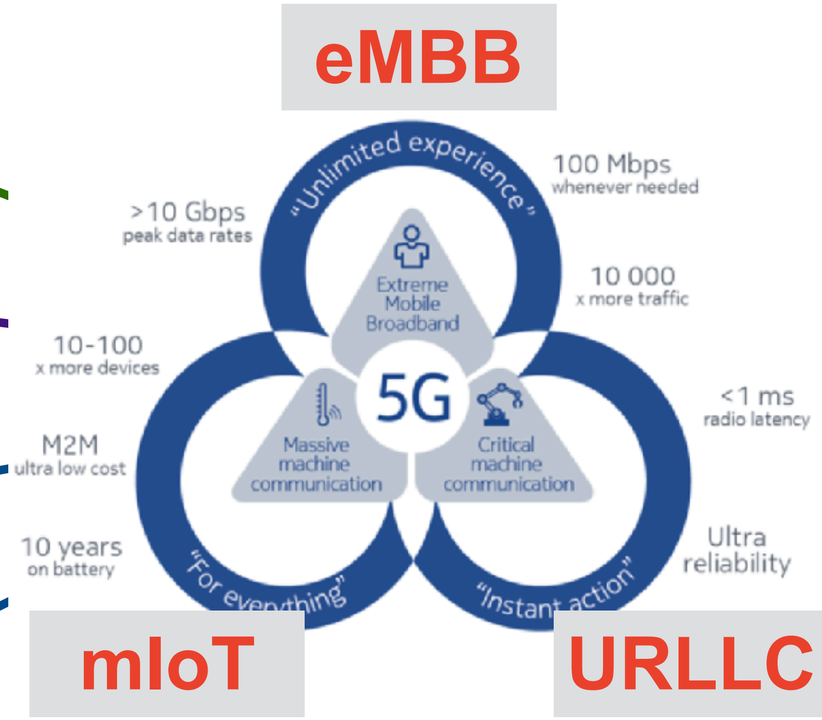
Mobile Broadband

Massive IoT

Reliable & ultra-low latency

0 1 0 1
1 0 0 1
0 1 0 0

Free access to information for all

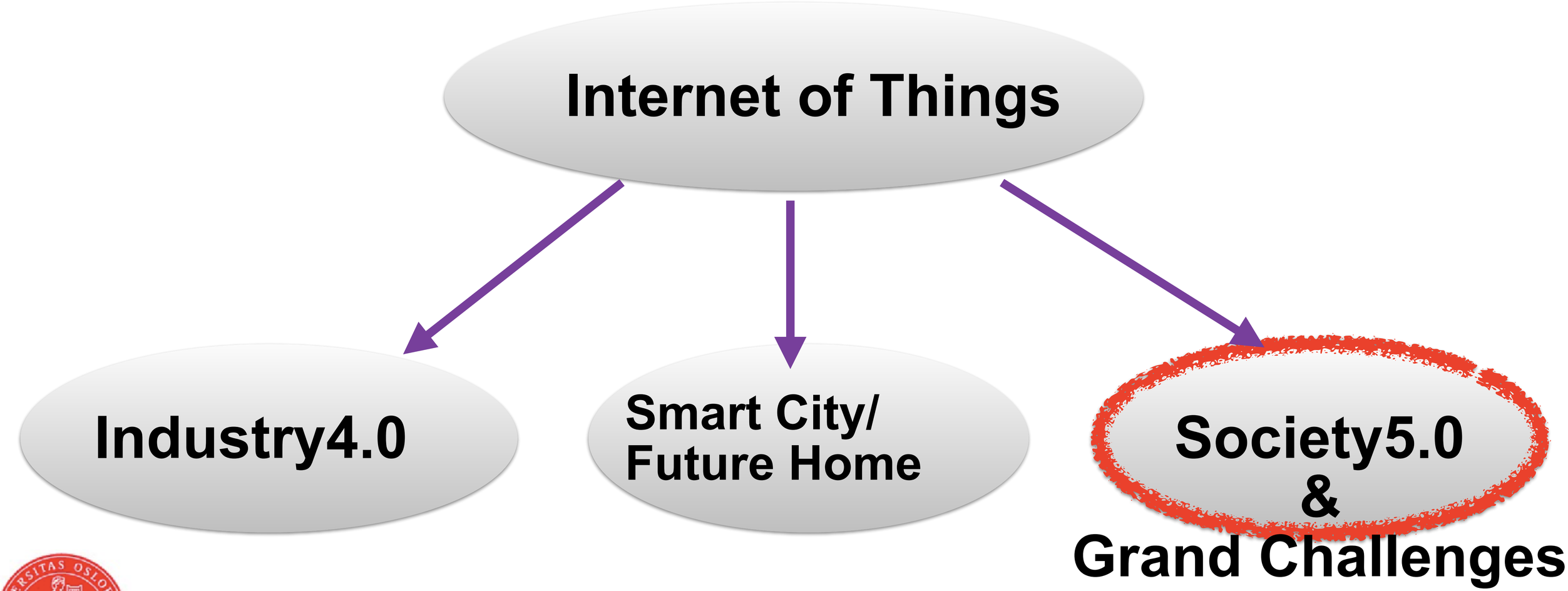


Communication, Internet, Entertainment

Automation, Manufacturing, Retail

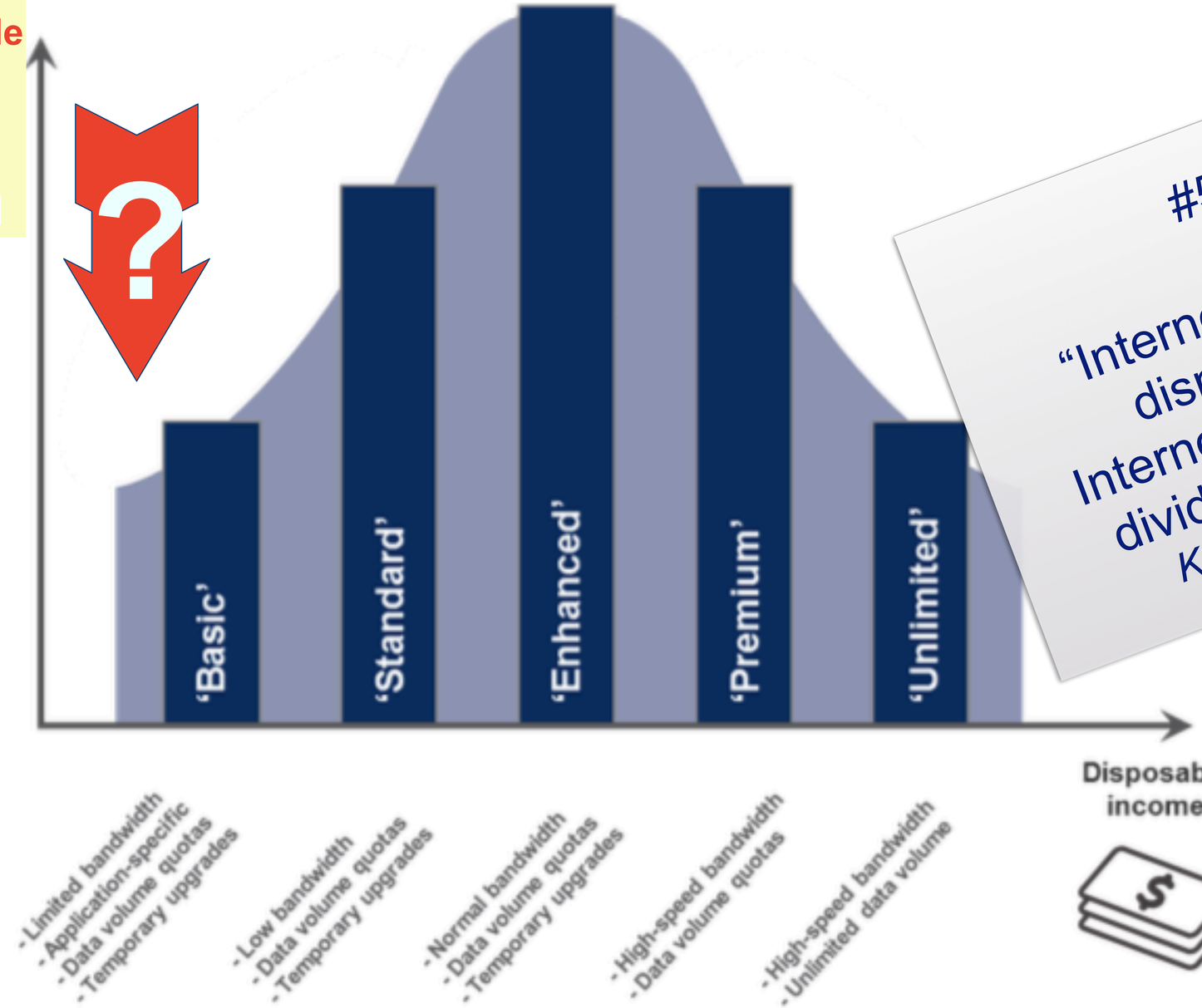
Autonomous systems
Health/Medical
Alarm, Infrastructure

Information
(text & pictures)


Internet of Things
Industry4.0
Smart City/
Future Home
Society5.0
&
Grand Challenges

Telecom view on digital inclusion

Addressable Market

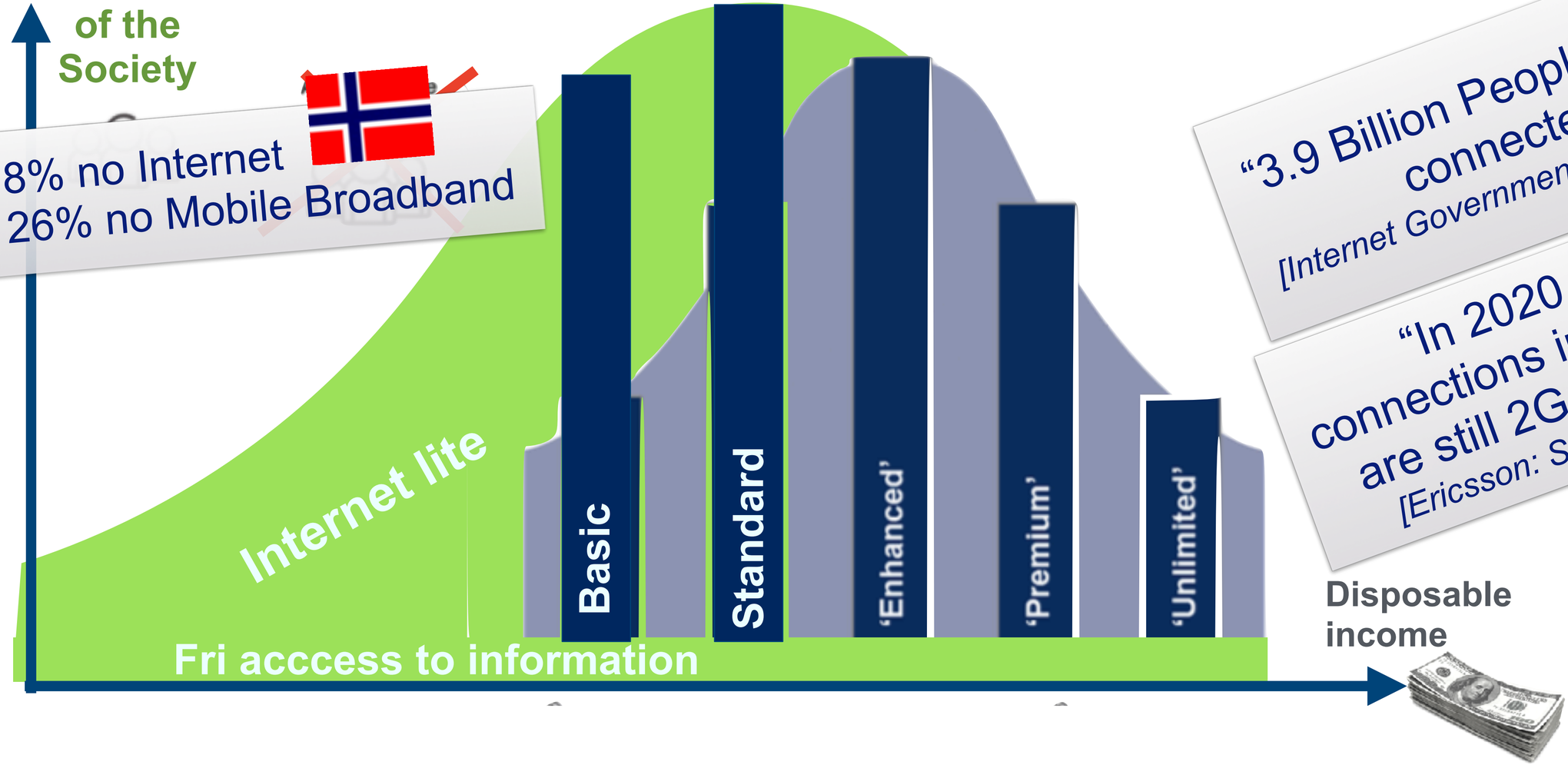


#5Gfor All?

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

Source: Service Innovation through Smart Networks, Ericsson, https://www.ericsson.com/assets/local/networks/documents/service-innovation-through-smart-networks.pdf

6G (#5GforAll) for digital inclusion



"3.9 Billion People are not connected"
[Internet Government Forum, 2018]

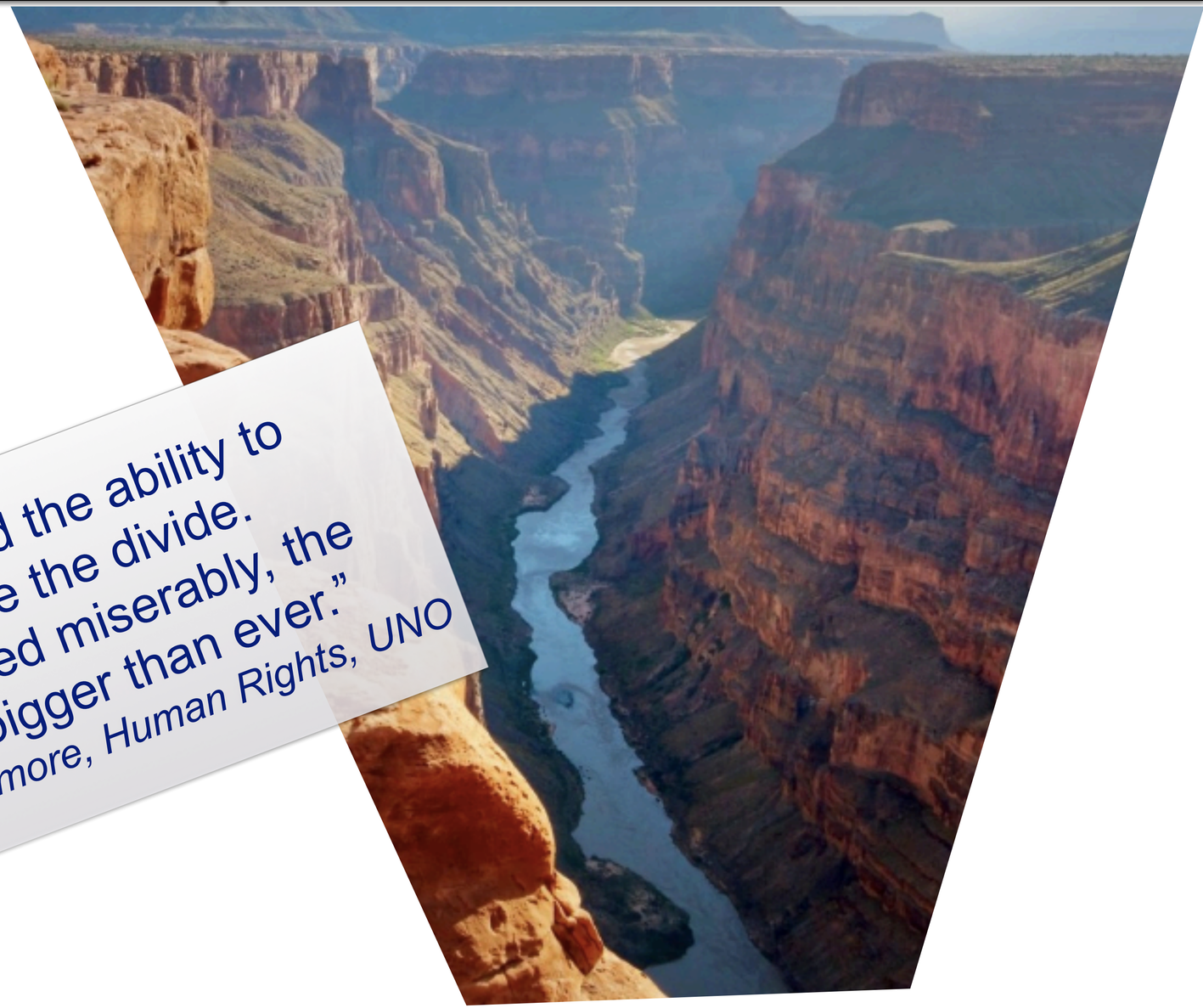
"In 2020 45% of connections in Africa (SSA) are still 2G connections"
[Ericsson: Service Innovation]

[Adapted from: Service Innovation through Smart Networks, Ericsson, 2018]

Grand Challenges

- Grand Challenges
  - Climate
  - Resources (radio, minerals)
    - Kobald (East - DR Congo)
  - Societal Security, Divide

- Digitisation
  - Mobile Networks
  - IoT
  - Automation



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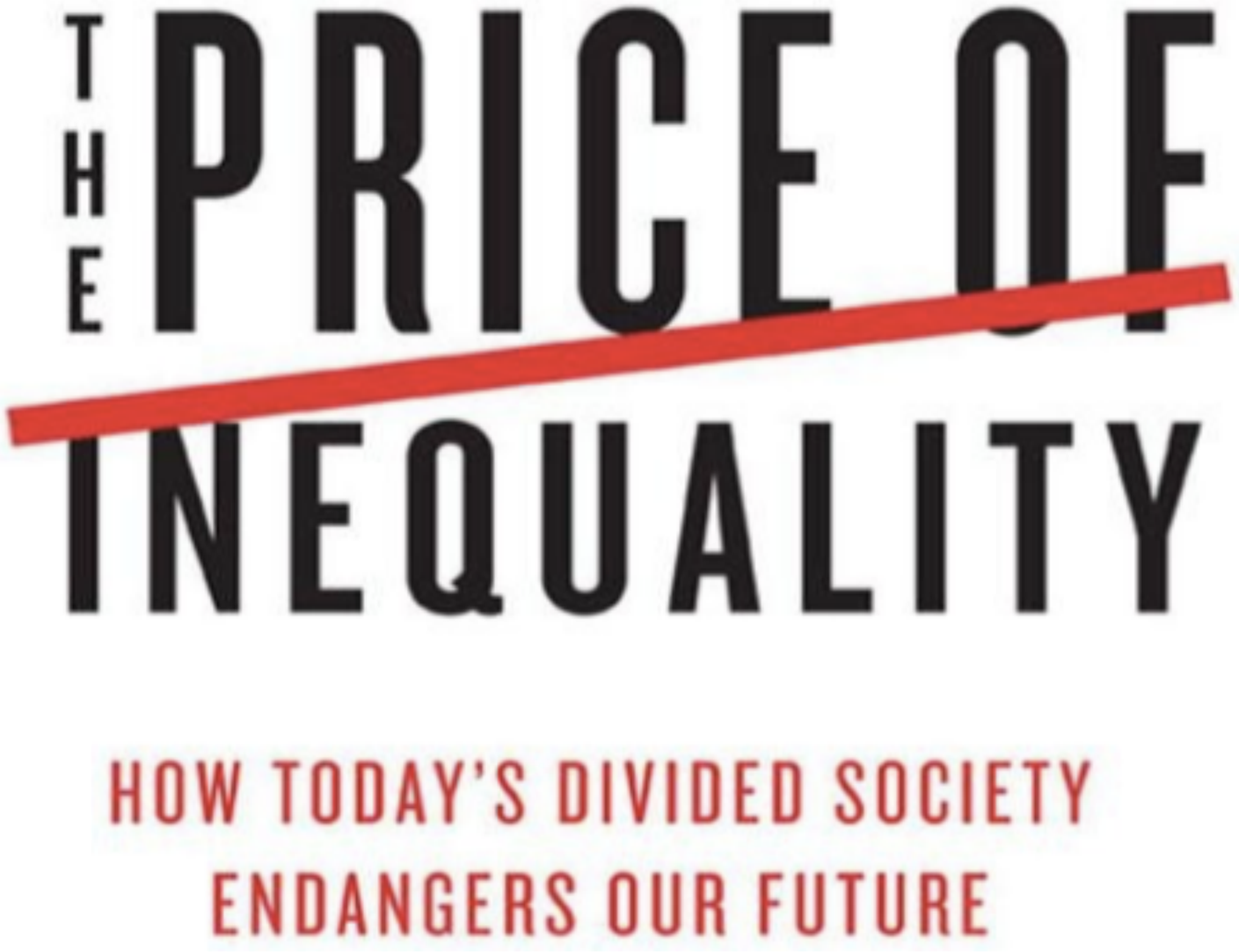
Grand Challenges

- Challenge 1: ~~Climate~~ not today
- Challenge 2: Resources
  - 30+ elements have <1% recycling rate
  - “Connect Trillions of devices” -> waste problem
- Challenge 3: Societal Security
  - Society5.0
  - Digital Divide

Starting Point:



Challenges - 5GforAll?

- Costs of Access
  - School connectivity (SDG indicator 4.A.1)
  - Digital Health for primary health facilities
  - Community involvement/digital transformation

- Digital Content
  - School/Health/Community info
  - National Knowledge Portal
  - Digital Public Goods (UN, UNICEF)

- Free access to Uganda Knowledge Portal

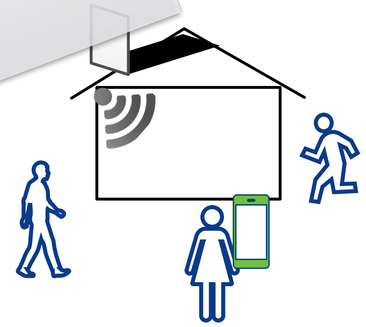
Main Message

- "Internet Lite for All" is the catalyst for the SDGs
  - ➡ free access to information for everyone
    - "walking and cycling on the Internet"
  - ➡ Digital Inclusion and Empowerment

- Freemium model for access
  - ➡ free access to information for all
  - ➡ premium access to broadband
  - ➡ sustainable solution

"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

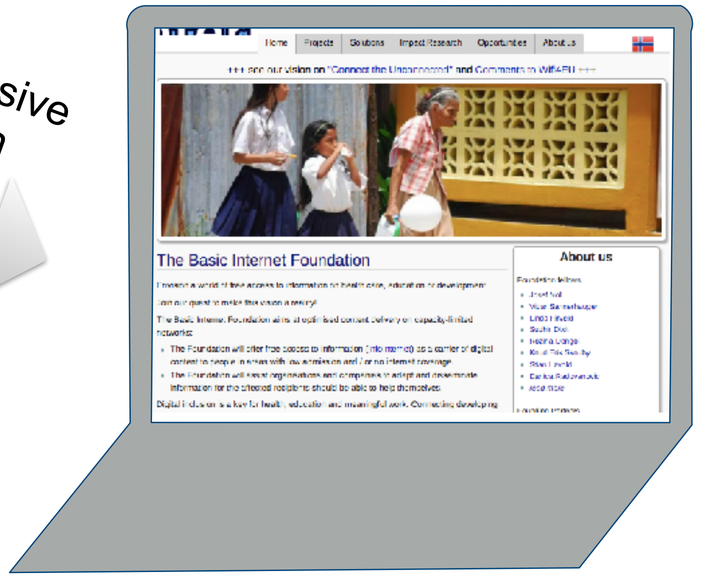


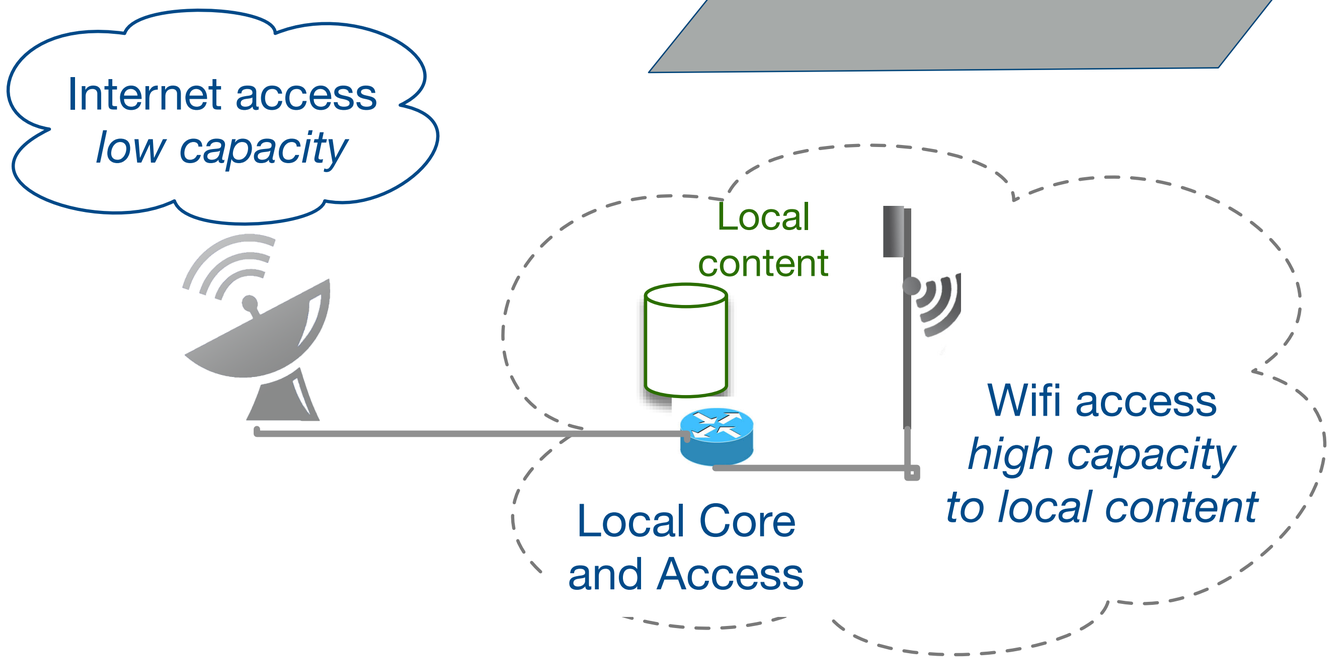
The Network Responsive Web

- Network responsive Web
  - through InfoInternet Standard
  - Adapt to network capabilities
    - Car queue in remote areas
    - Mobile tethering (Wifi)
  - Server-side adaption of content

- Examples
  - Opera Mini (proxy)
  - Chrome (compression)
  - AMP protocol

Responsive design





Lightweight Protocols, e.g. AMP

BasicInternet.org/Mission

Unconnected Areas

Despite some sort of connectivity, the privilege of access in some areas is that the access is not being used. This is the challenge that includes that access is not enough.

Women in Rural Areas

According to the report of the Alliance for Affordable Internet (Feb, 2017), the digital gender gap has increased globally from 11 % in 2013 to 12% in 2016. The gender gaps are more prominent in developing countries in comparison to developed countries.

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Conclusions

- Sustainability in Mobile Development
  - 5G is not answering the Digital Divide
  - 5G is not contributing to the Sustainable Development Goals
- 6G for Humanity and Sustainability
  - Address the Grand Challenges
  - Remove the Digital Gap
    - “Nobody should be left out from the Digital Society”
    - Give everyone access to digital information & IoT
    - Freemium model for access

Regulatory framework for digital inclusion