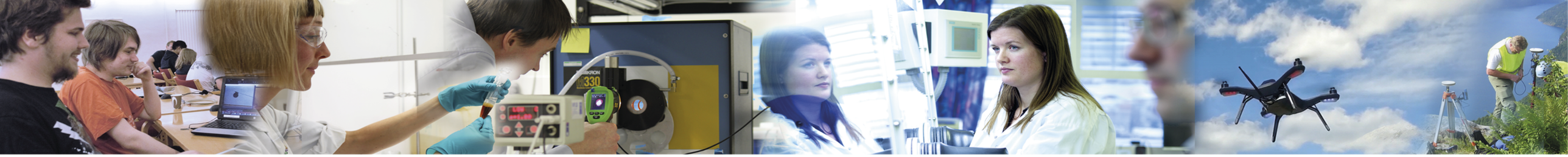


UiO : Department of Technology Systems
University of Oslo

Pep-talk Telenor, 15Mar2019

Digital Inclusion, the killer app for 6G

Josef Noll,
Professor, University of Oslo, Department of Technology Systems
Secretary General, Basic Internet Foundation
Kjeller, Norway, m: +47 9083 8066, e: josef@jnoll.net

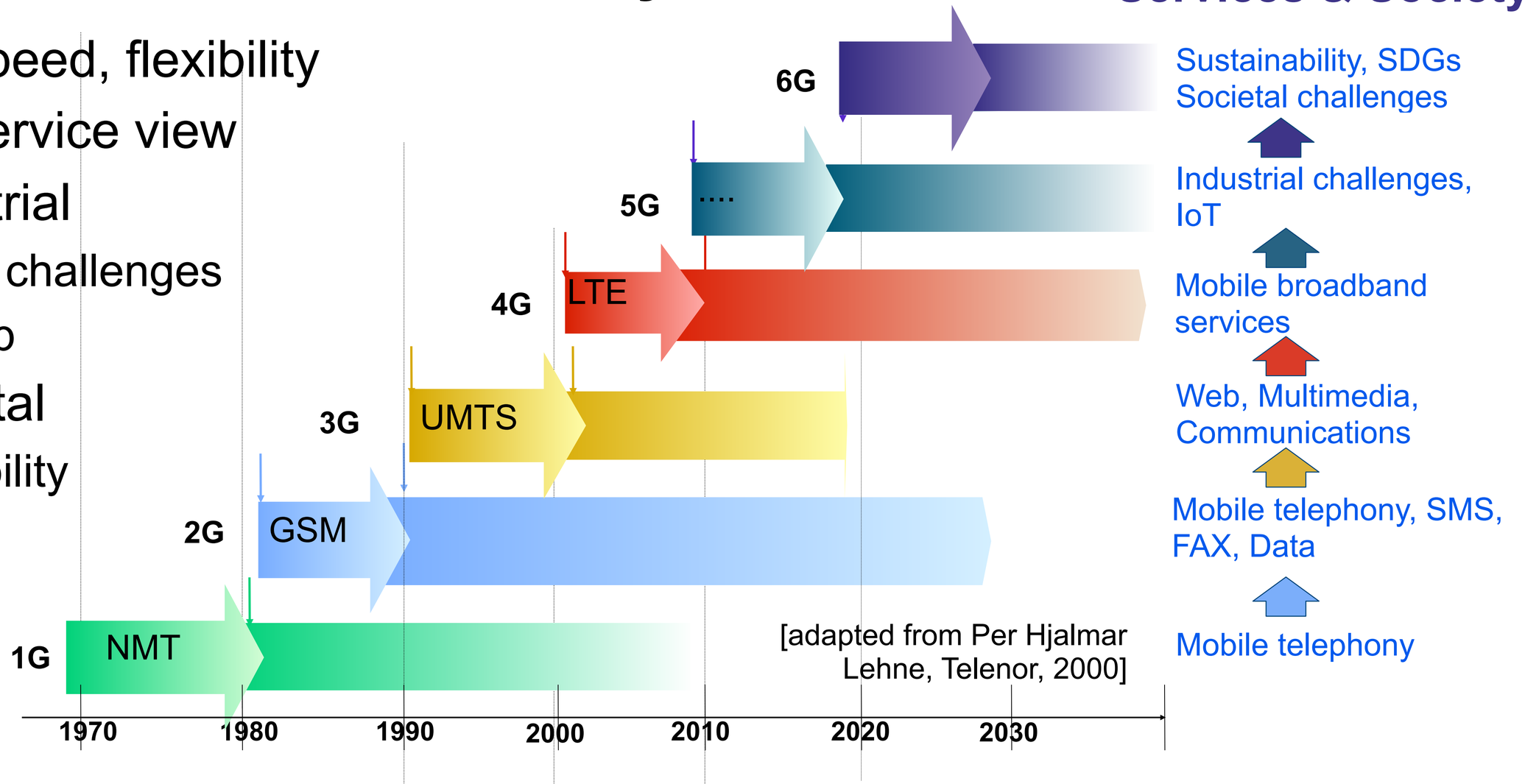
Outline

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

- Mobile development
  - From Network development
  - To Societal Empowerment
- Sustainability and Responsibility in 6G
- Privacy, Internet and net-neutrality
  - Facebooks Free Basics
  - India: "We have been colonised once…"
- Discussion

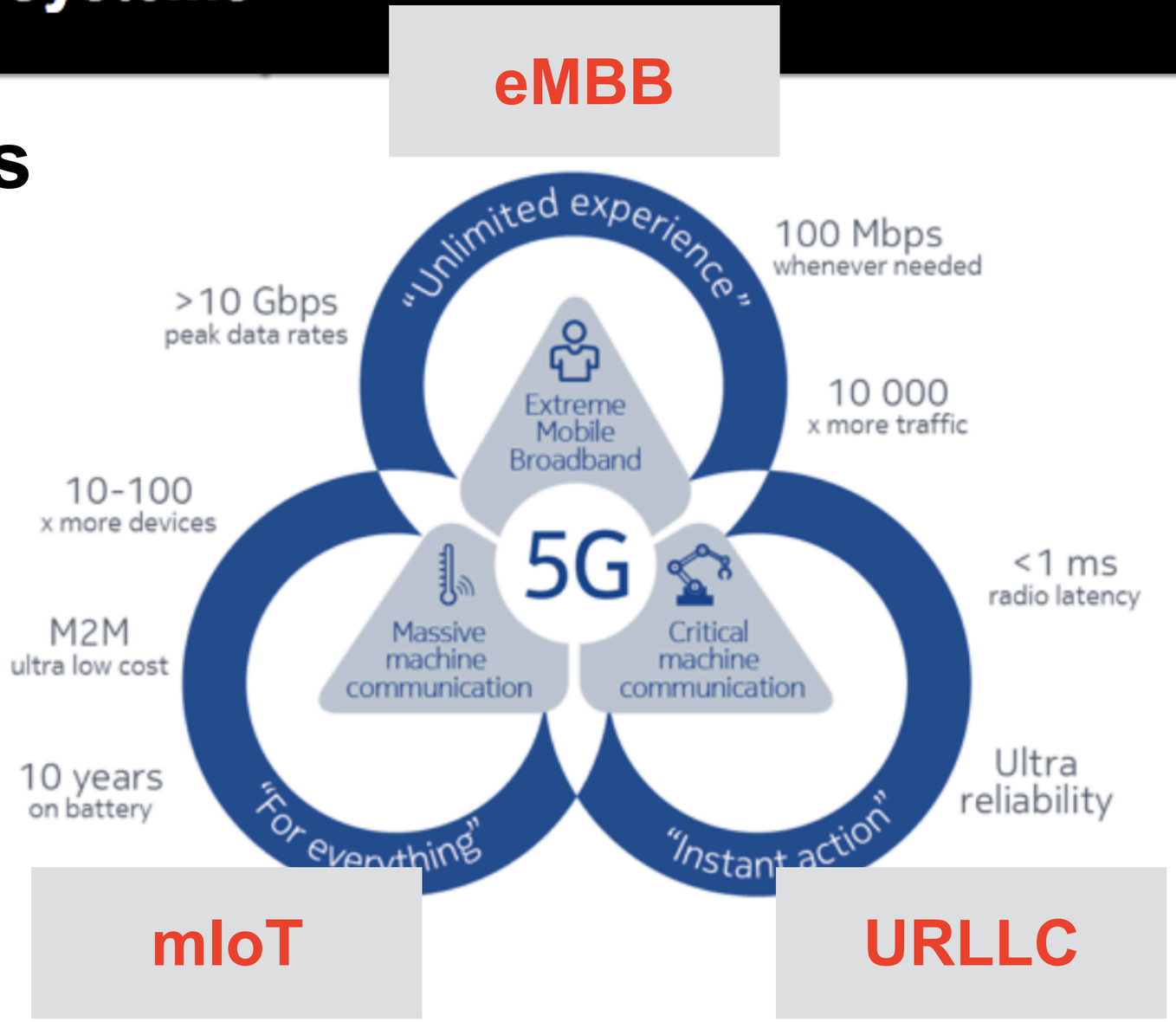
6G: Digitisation of the Society

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



5G: Industrial Challenges

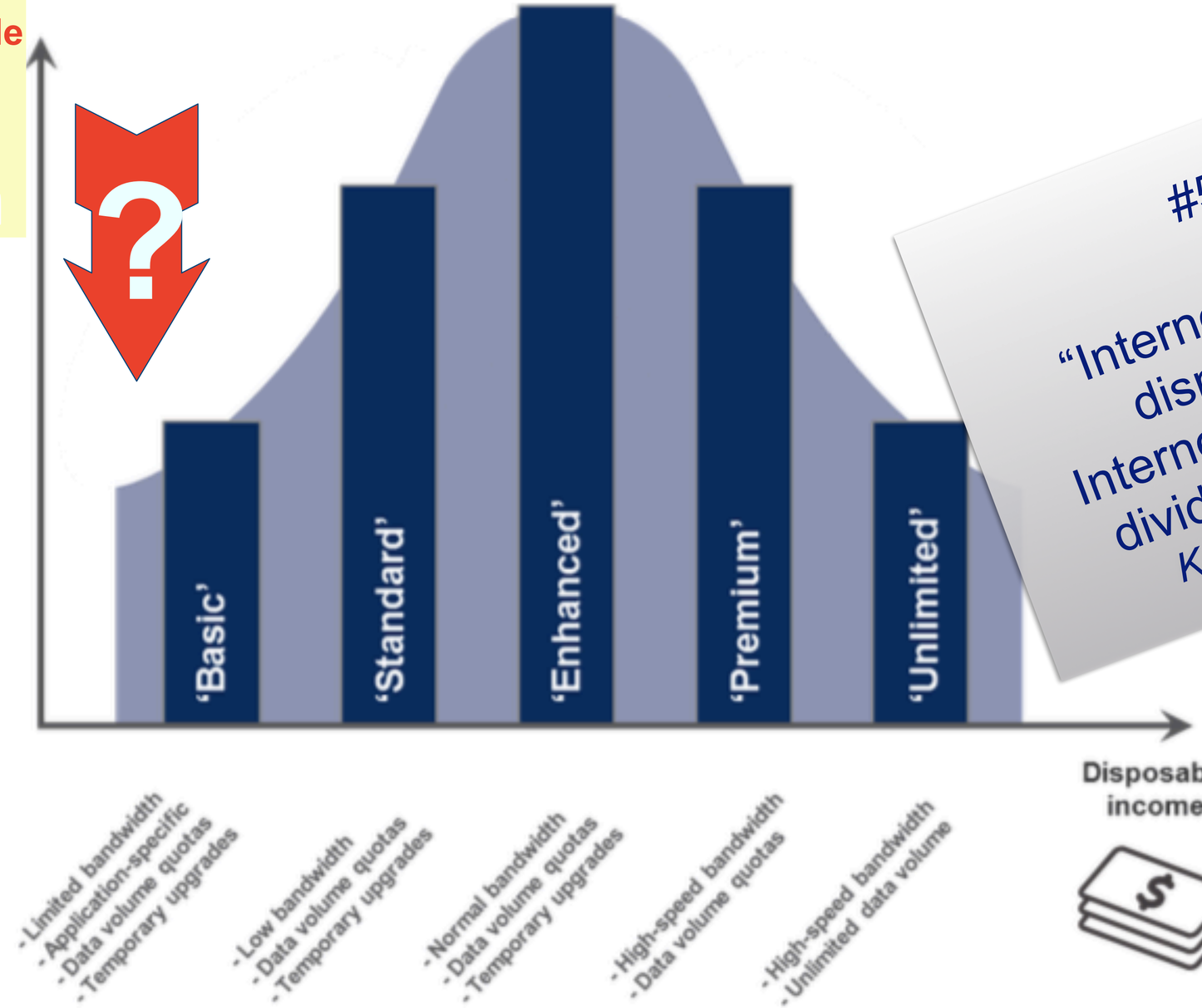
- enhances Mobile Broadband
- massive IoT
- ultra Reliable, Low Latency communication



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

Telecom view on digital inclusion

Addressable Market

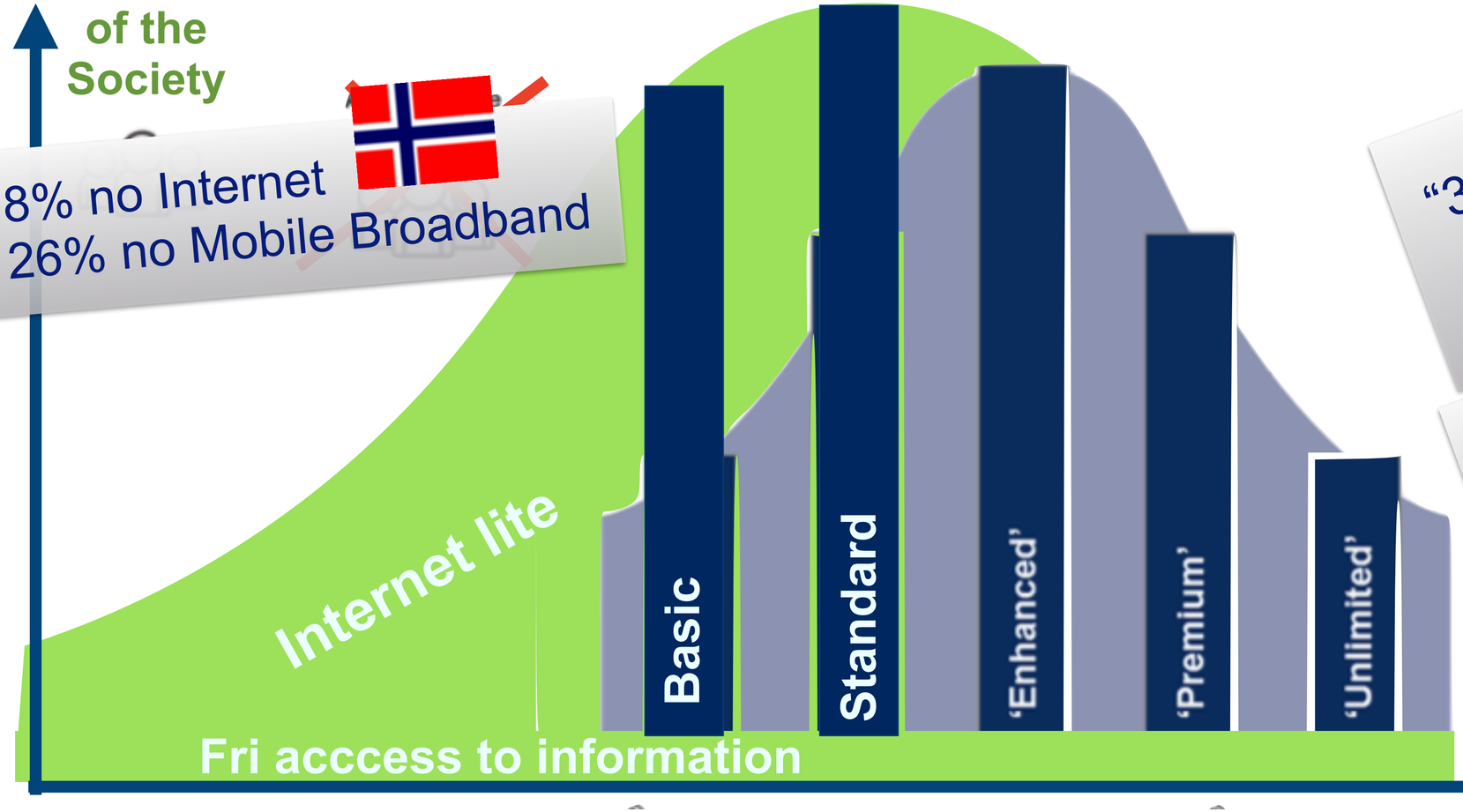


#5Gfor All?

"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]

And what about IoT?

SUSTAINABLE DEVELOPMENT GOALS

FREEDOM OF EXPRESSION

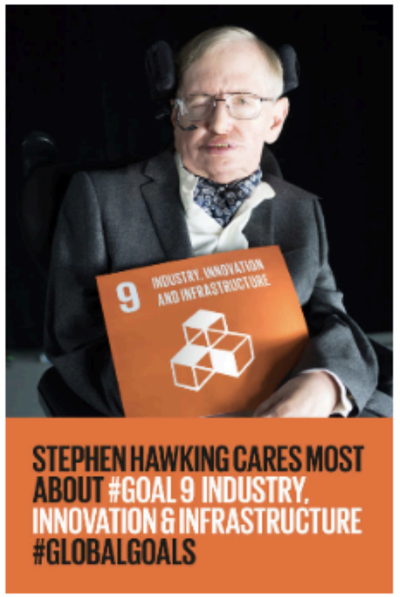
We can't reach the U.N. goals for sustainable development without the internet

22 JUNE 2017 | 11:40 AM

Tweet Share

It's become common wisdom that the United Nations' ambitious "Global Goals for Sustainable Development" aren't just for the U.N., or even governments, to implement. Launched in September 2015, the 17 goals and 169 targets are "a series of ambitious targets to end extreme poverty and tackle climate change for everyone by 2030" (hence the alternative moniker, the "2030 Agenda for Sustainable Development").

Replacing the more arcane "Millennium Development Goals," these Sustainable Development Goals (SDGs) are everyone's goals, crowd-sourced to completion and promoted by companies and civil society alike. (Cue the hip, auto-playing video on the website.)



Smartly, the goals, especially Goal 17, emphasize that **access to technology underpins every one of these commitments** to the eradication of extreme poverty.

However, not all connectivity is the same, nor yields the same benefits to societies in terms of economic, social, or cultural development. As we told the International Telecommunication Union (ITU), only **stable, secure, and open access** to broadband internet will ensure success for the U.N. SDGs. That's something civil society and our partners will continue to make clear, and we'll need to work in legislatures to get the point across, not simply at aid and development banks.

To reach the SDGs, we need civil and political advocacy

Traditionally, information and communications technology (ICTs) have not been a major recipient of aid funding. That's one reason this crucial technology is "under-represented" in the SDGs and appears in only four of the 169 targets. It's assumed that telecommunications will take care of itself, having been largely deregulated and privatized in the 1980s and 1990s. Yet **more than half the world's population is not using the internet**, a statistic showing the failure of local, national, and global governance, with economic, political, and moral implications

PETER MICEK
@lawyerpants

FREEDOM OF EXPRESSION | GLOBAL | #ITU4SDG | #KEEPITON | CONNECTIVITY | ITU | SDG | SUSTAINABLE DEVELOPMENT GOALS | UNITED NATIONS

RELATED

Beyond connectivity: building an inclusive U.N. agenda for internet development Read More ▸

Access Now welcomes new report on economic impact of shutdowns Read More ▸

https://www.accessnow.org/cant-reach-u-n-goals-sustainable-development-without-internet/

5G network slicing for Free Access to Information for All

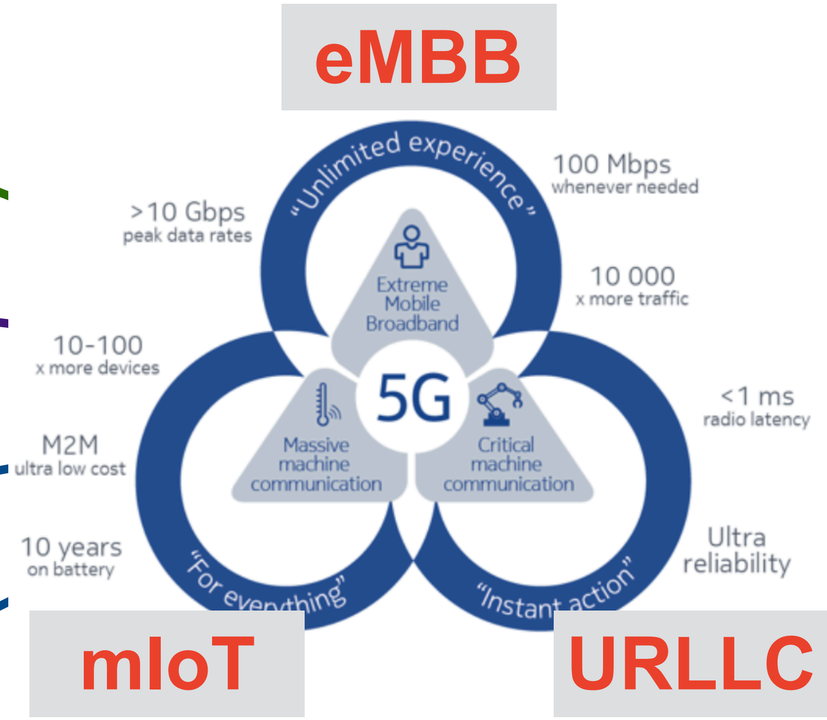
Mobile Broadband

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

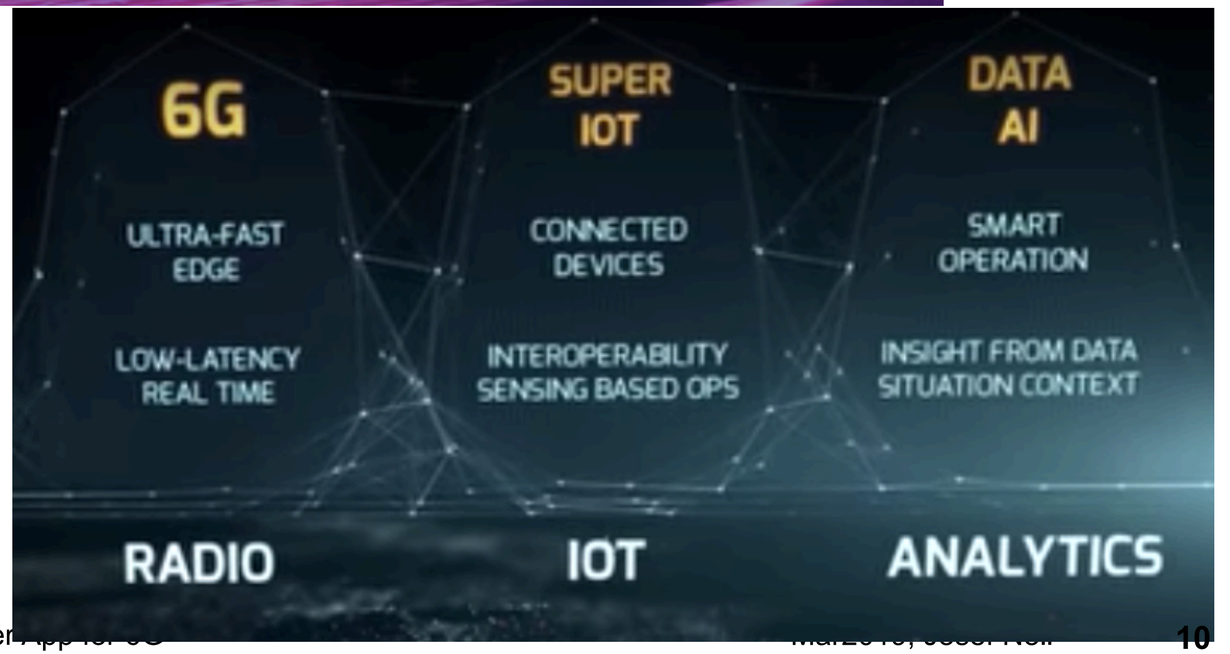
Autonomous systems Health/Medical Alarm, Infrastructure

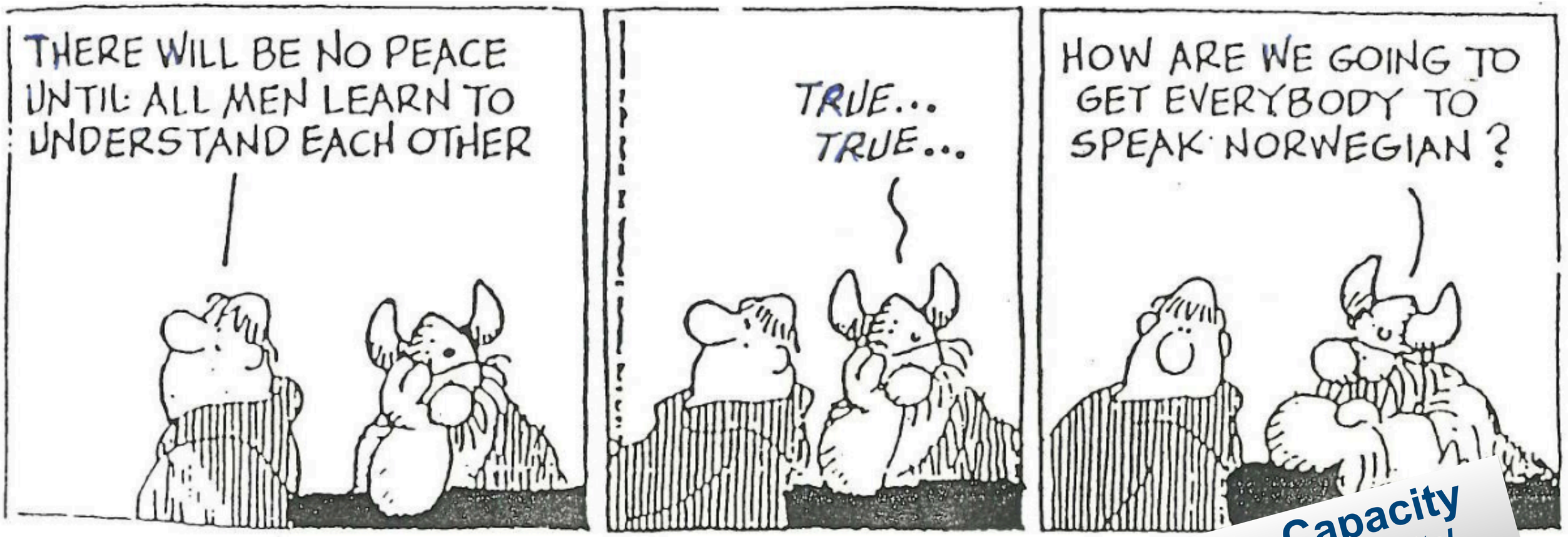
Information (text & pictures)

Internet lite for all
the catalyst for the goals

6Genesis.com by Oulu University

- Lighthouse project in Finland
  - 251 M€ funded
- Goals
  - Support industry in finalization of 5G
  - Develop the fundamental technology needed to enable 6G
  - Speed up digitalization in society
- Focus on Sustainable Development
  - FI, SE, NO, DK academic collaboration





Inclusiveness - Trust - Capacity
United Nations High Level Panel on Digital Cooperation 2019

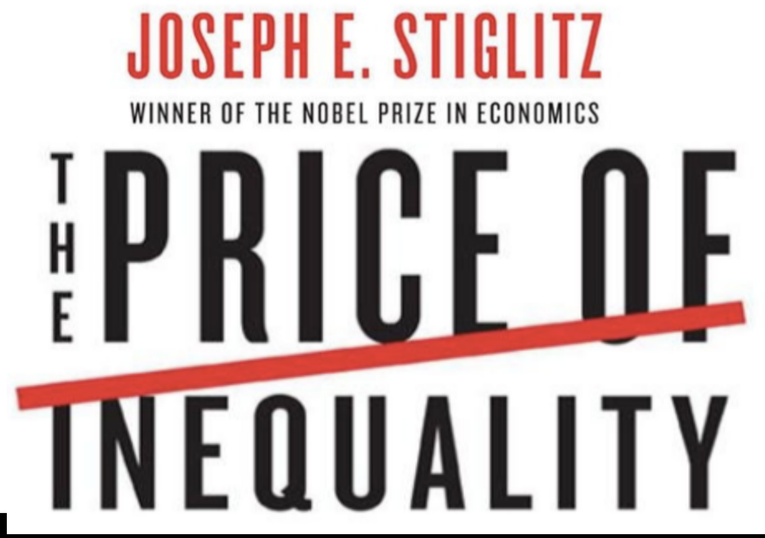
6G - Discussion

http://www.6gsummit.com

- Mobile evolution
  - ➡ from technology
  - ➡ to services
  - ➡ to societal empowerment
- Internet Lite for All
  - ➡ free access to information

[Source: aftenposten.no]

Sharing Economy: "Telenor will create a digital ecosystem in Pakistan"



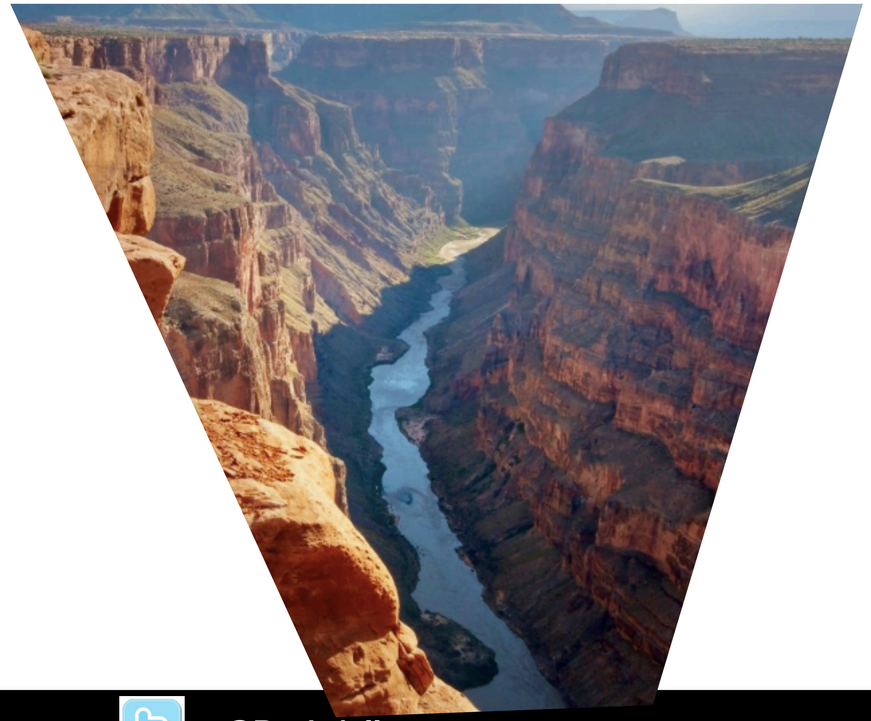
- Background slides

Grand Challenges - a.o. Digital Divide

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

- Digitisation
  - Mobile Networks
  - IoT
  - Automation
  - …

- Will enhance
  - the digital divide

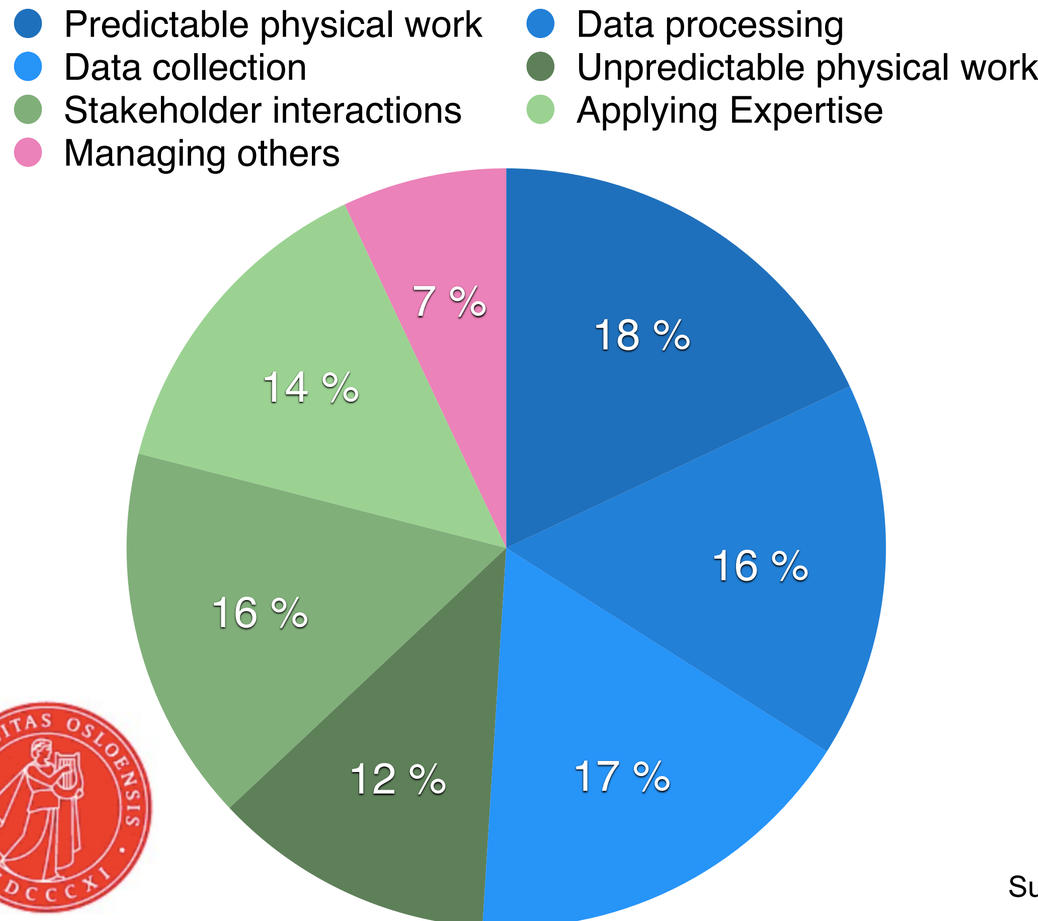


Basic Internet Focus

- How are **we** going to address the challenges?
- Digital Inclusion and Empowerment
  - Specific Solution:
    - Internet Lite for All
    - Freemium Model for Access

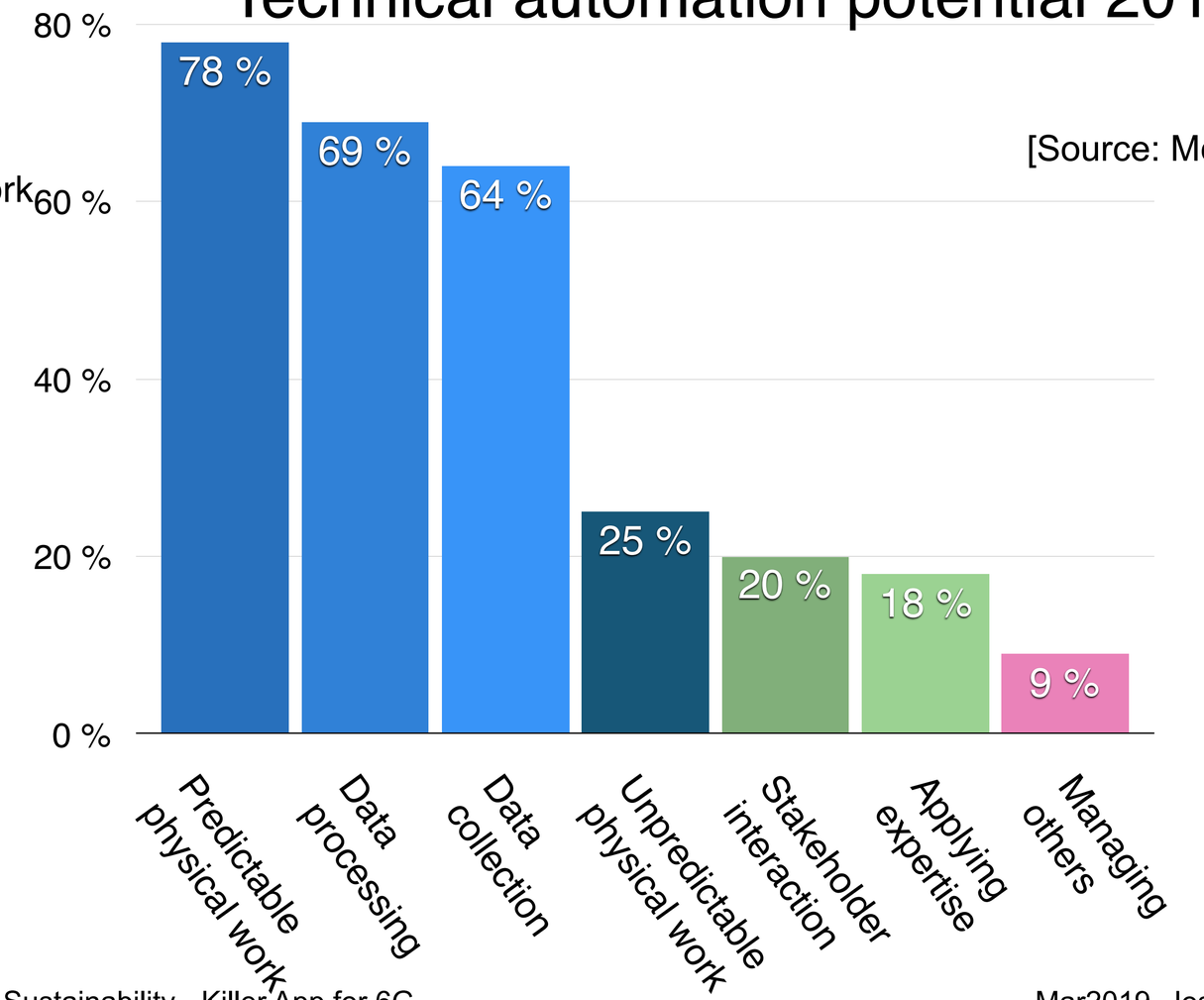
The challenge from automation

USA work force time spent [%]

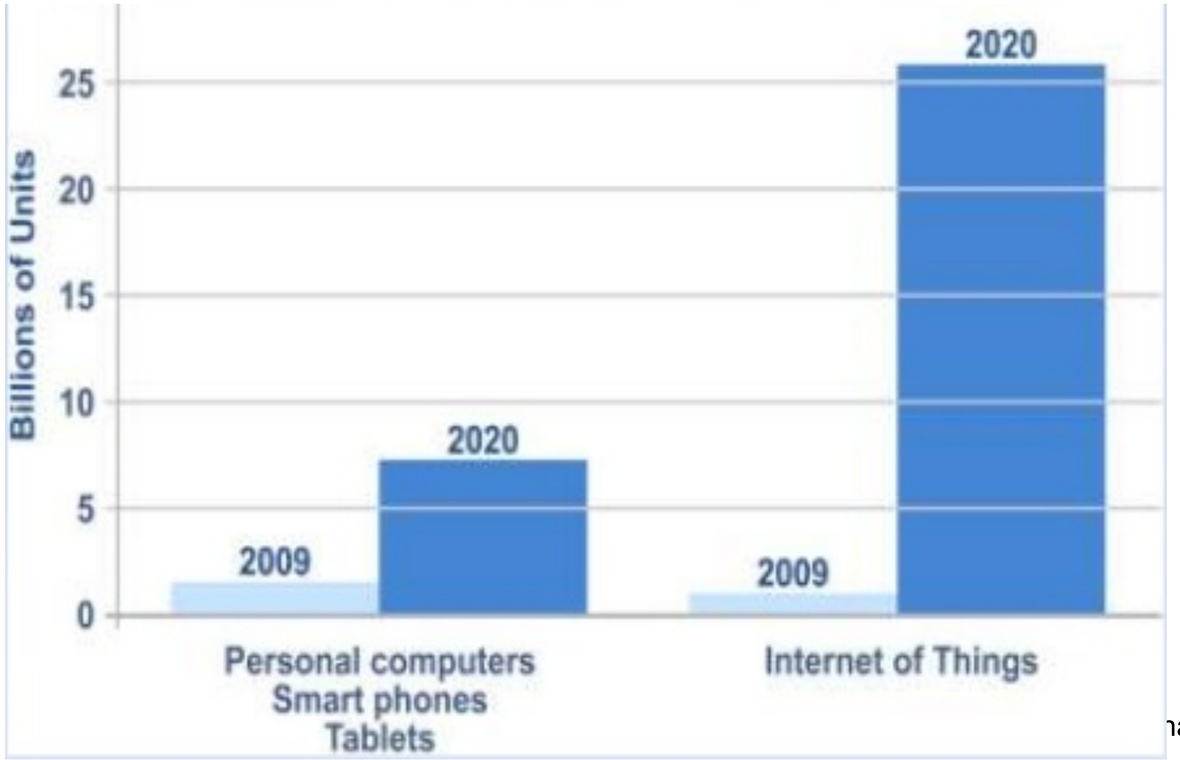


Technical automation potential 2016 [%]

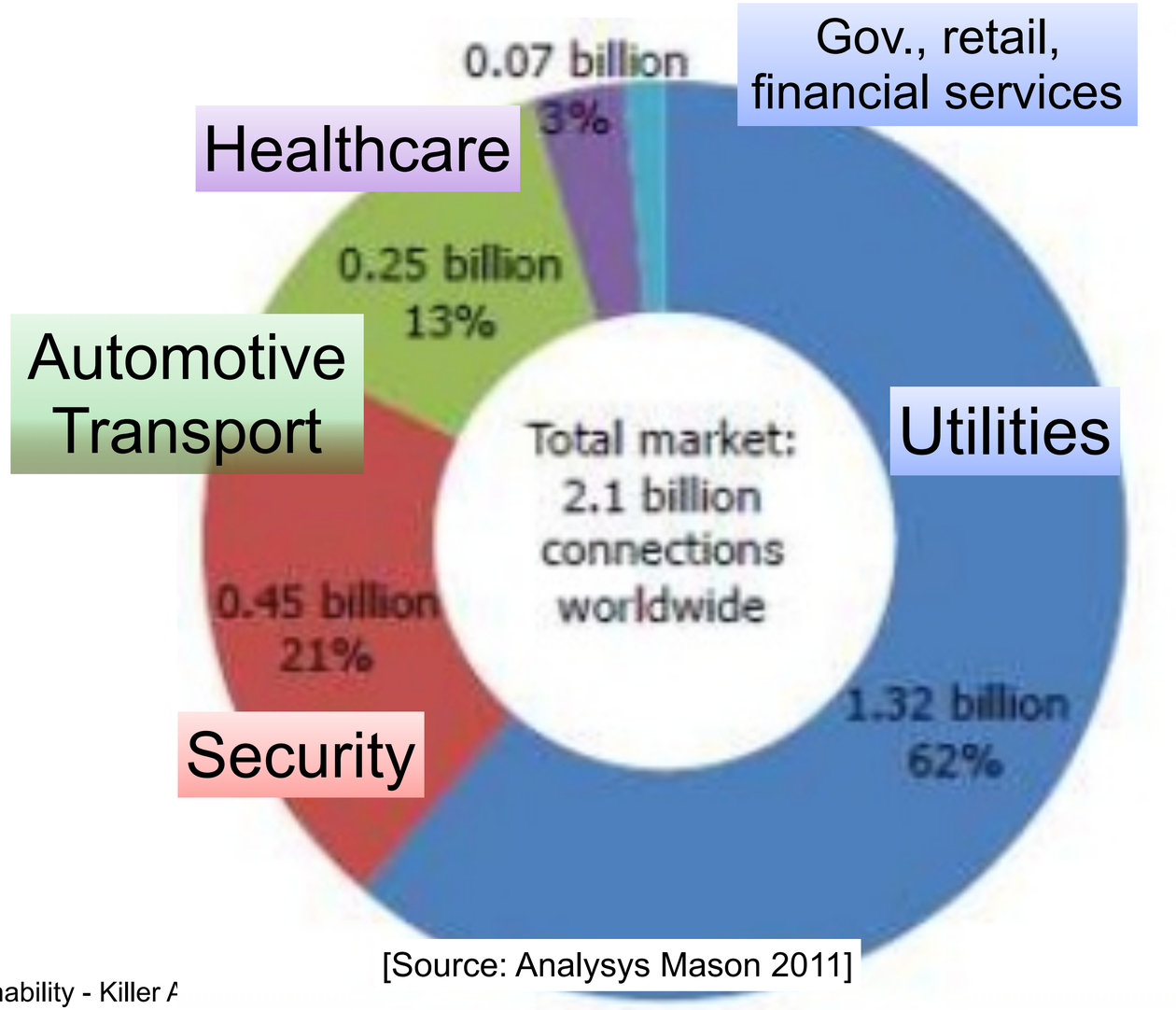
[Source: McKinsey, 2016]



IoT - 10 x impact of Internet



Commercial & Consumer M2M Device Connections Worldwide 2020



[Source: Analysys Mason 2011]