



**Master program in International Community Health,
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The Information-Internet for Digital Inclusion

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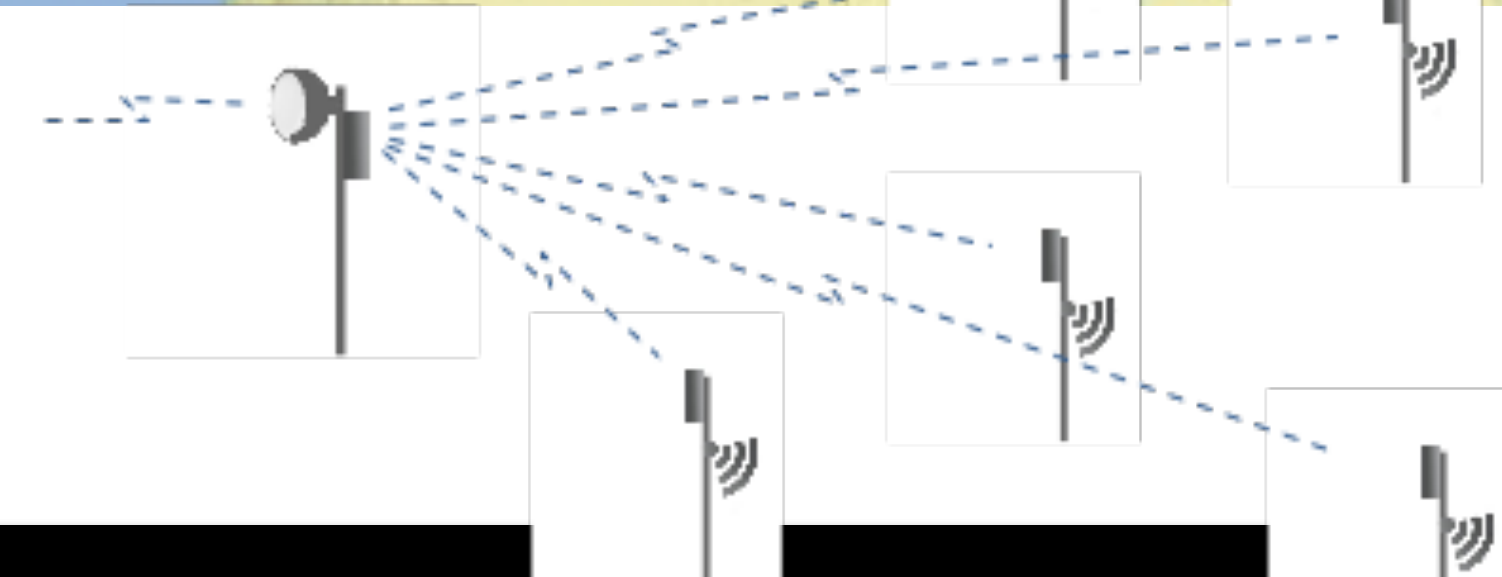
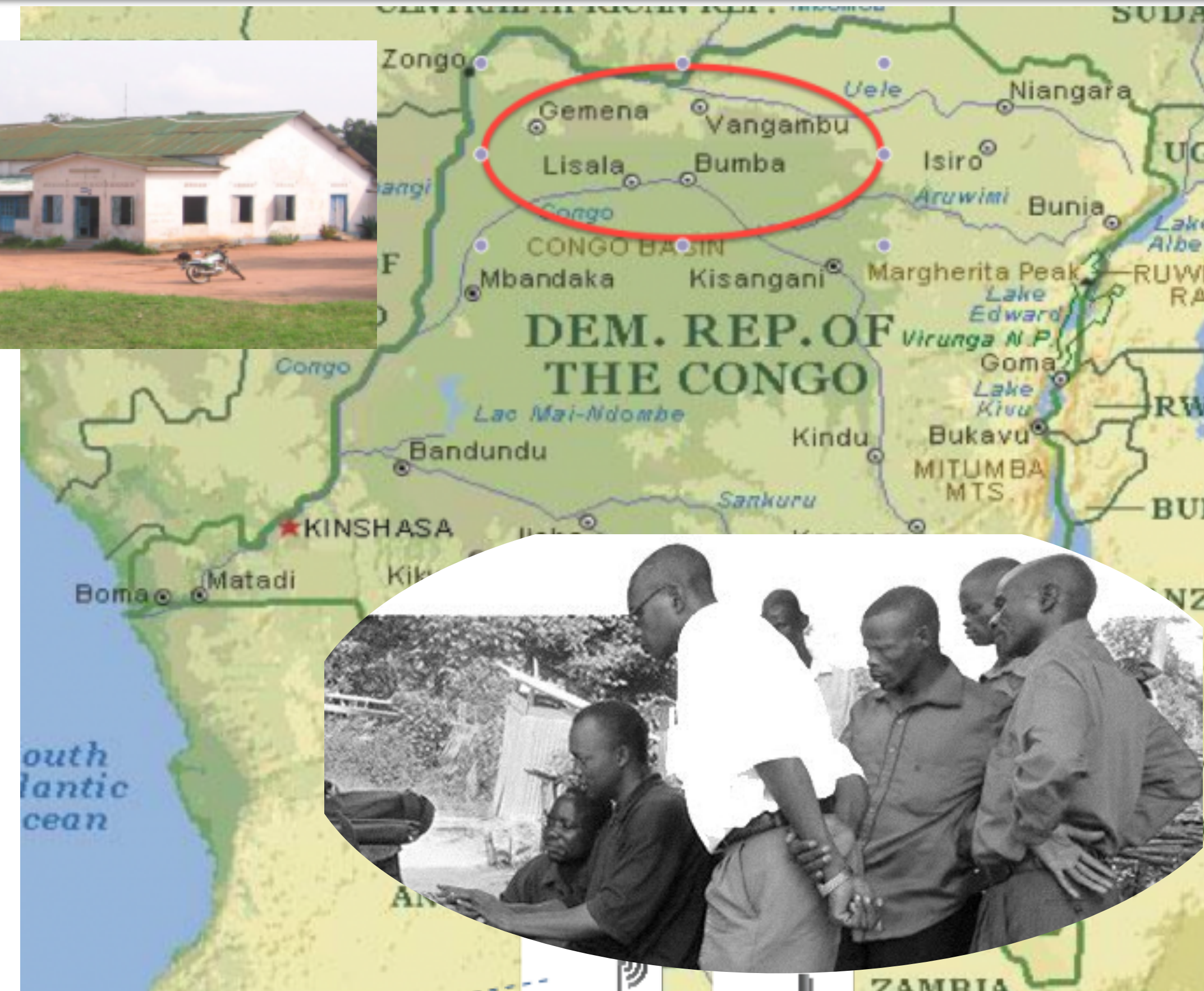
**Prof. at University Graduate Studies
(UNIK), University of Oslo (UiO)**

**Head of Research at Movation AS
Norway**



Background

- Internet provision to various parts of DRC
 - ➔ operations since 2011
- Connection to a.o. University of Lisala
- Experiences from Internet provision
 - ➔ Expensive access: 2000 US\$/month for 1 Mbit/s
Note: 80 Mbit/s for 66 US\$ (NO), factor: **2.420**
or **0.04%**
 - ➔ Requirement for self-sustainable infrastructure
- Developed network infrastructure
 - ➔ low-cost establishment of local hot-spots
 - ➔ remote core infrastructure (in Norway)
 - ➔ based on experiences from Internet history at UiO/UNIK



Connectivity & Affordability

- Mobile driven development,
 - ➔ Revenue-driven
- **Affordability** (costs of data)
- industrial perspective
 - ➔ Industry4.0, Internet of Things
- **Novel Approach** required



The Unconnected Market Landscape

Unique Mobile Internet Users

Population 15+ (bn)	Total
Developed World	0.9
Developing World	4.3
Total	5.2

BMI	NMI	Unconnected	Total
0.6	0.1	0.3	
1.0	0.8	2.5	3.3
1.6	0.9	2.8	

Penetration 15+ (%)	Total
Developed World	100%
Developing World	100%
Total	100%

BMI	NMI	Unconnected	Total
64%	3%	27%	
23%	18%	59%	77%
30%	17%	53%	

Source: GSMA Intelligence; figures reflect position at end of 2014
 BMI = Broadband Mobile Internet (3G/4G); NMI = Narrowband Mobile Internet (<3G)

77% don't have decent access

[Source: GSMA, Nov2015]

InfoInternet - the infrastructure for Digital Access



Road Infrastructure

- Basic infrastructure
 - free usage for pedestrians & cyclists
 - authentication for cars
- Highways & toll roads
 - speed & comfort
 - often privately managed
- Successful complementarity



InfoInternet Infrastructure

- Basic Access
 - free access of information
 - walk to Internet
- Broadband and Mobile services
 - Voice, video & games
 - speed & comfort
 - privately managed
- Complementarity



The need for an Information-Internet (**InfoInternet**)



Partnership for digital inclusion	
Telecom	InfoInternet
revenue-driven	non-profit
targeting leveraged creation	targeting no- and limited use
voice & mobile broadband	compressed text & pictures
subscription based (SIM)	free access & voucher
mobile network: coverage & capacity	Wifi-spots: health-/community centres, schools
operator cost model	target: 0.5 US\$/month
operator roll-out	NGO & community roll-out



[Source: GSMA, Nov2015]



United Nations Sustainable Development Goals



Topics of discussion for digital health

inventory list
commodities
epidemiological

after hospital
transitional care
digital support group
rare diseases
Medical data handling
emergency / refugee
online prescription
"digital money"

- Please contact Josef Noll, m: +47 9083 8066 for more info and common work



Background slides

Internet is a basic human right

- Is Internet access and online freedom of expression a basic human right?
- “All people should be allowed to connect to and express themselves freely on the Internet.”



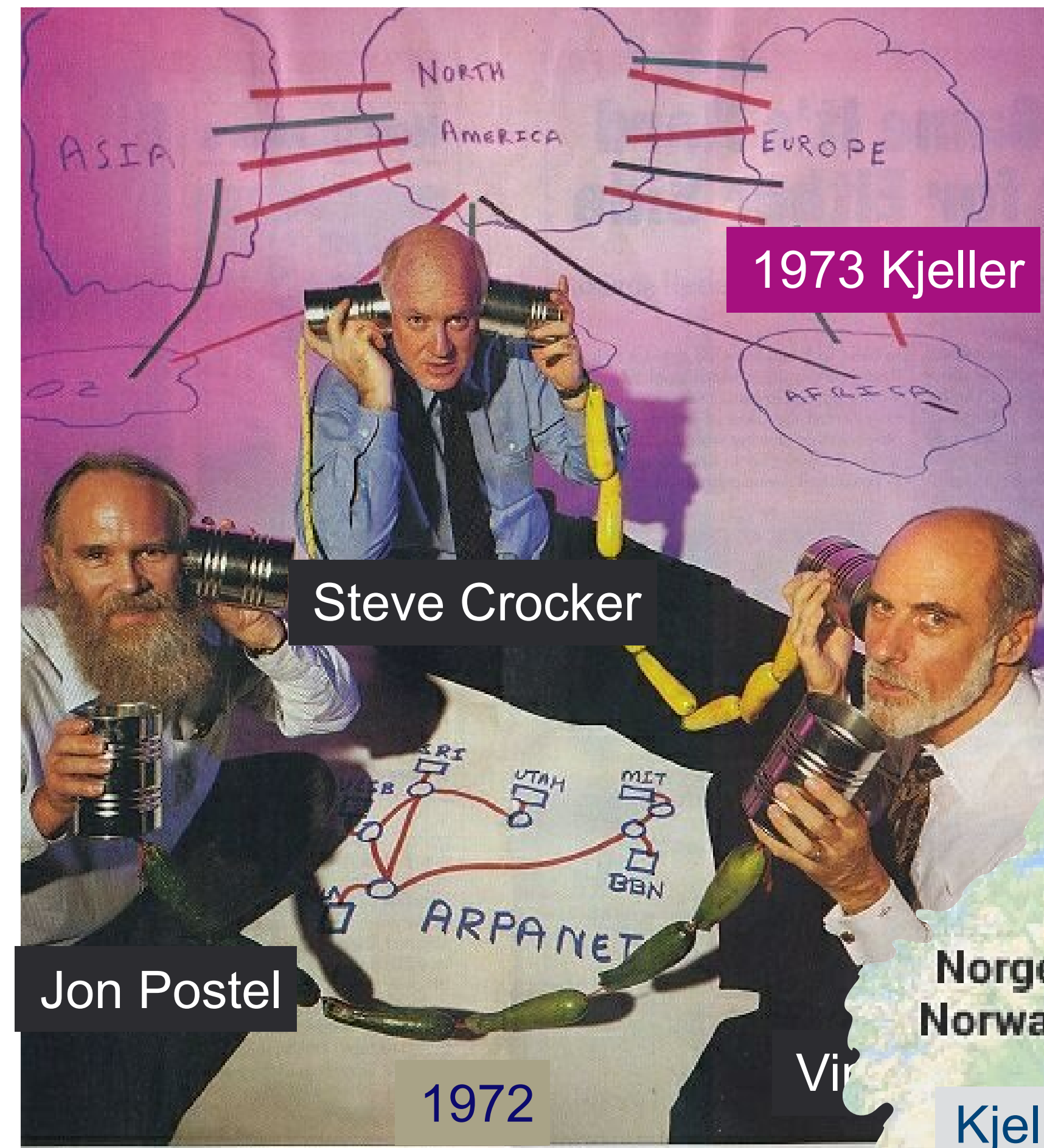
- The United Nations’ Human Rights Council unanimously backed that notion in a resolution on **5 July 2012**. All 47 members of the Human Rights Council including China and Cuba signed the resolution.



- The building where the Internet (Arpanet) came to Europe in June 1973

1971 (at which point 23 hosts, at universities and government research centers, were connected to the ARPANET); 29 by August, 1972, and 40 by September, 1973.

At that point, two satellite links, across the Pacific and Atlantic Oceans to Hawaii and Norway (NORSAR) had been added to the network. From Norway, a terrestrial circuit added an IMP in London to the growing network.



1973: Internet to Kjeller/Europe

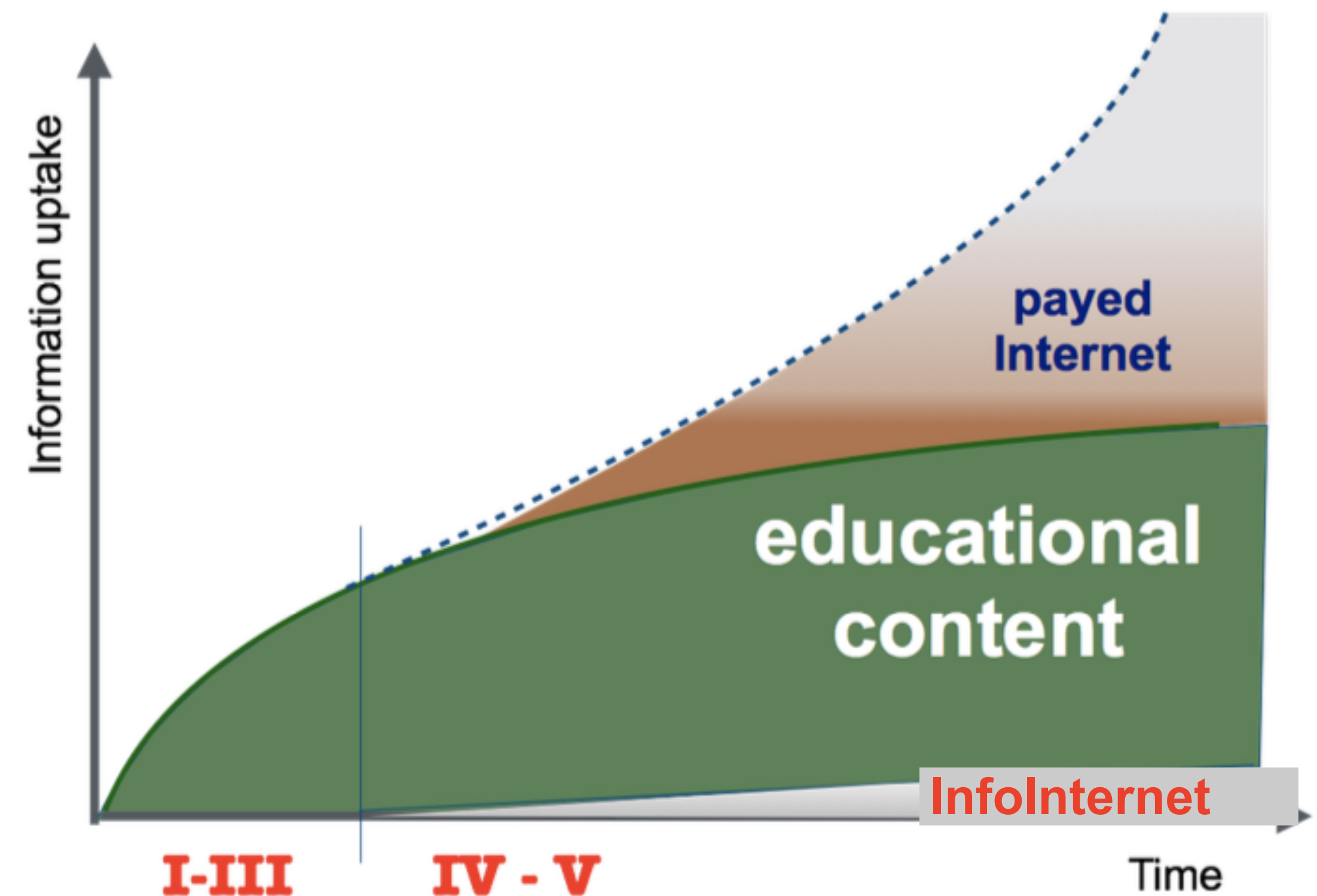
1994: Opera Software

2014: Basic Internet «half a dollar is enough»

Source: <http://www.michaelkaul.de/History/h...>

The need for an Information-Internet (**InfoInternet**)

- Pilot - Kinshasa (DRC)
 - ➔ Information focus (text & pictures)
 - ➔ low-ba
 - ➔ Focus on compressed text and pictures
- **Affordability** (costs of data)
- industrial perspective (Ind4.0)

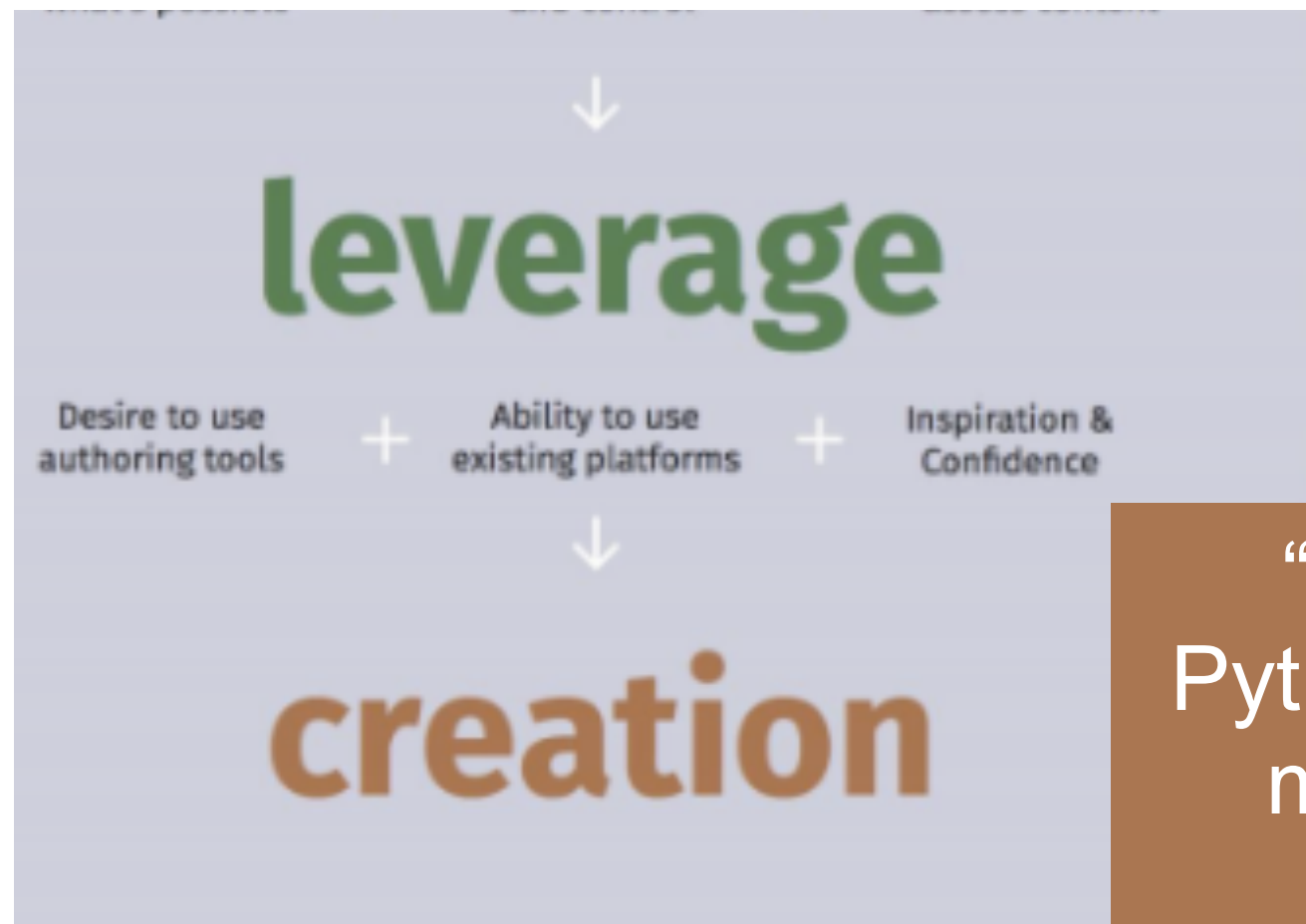
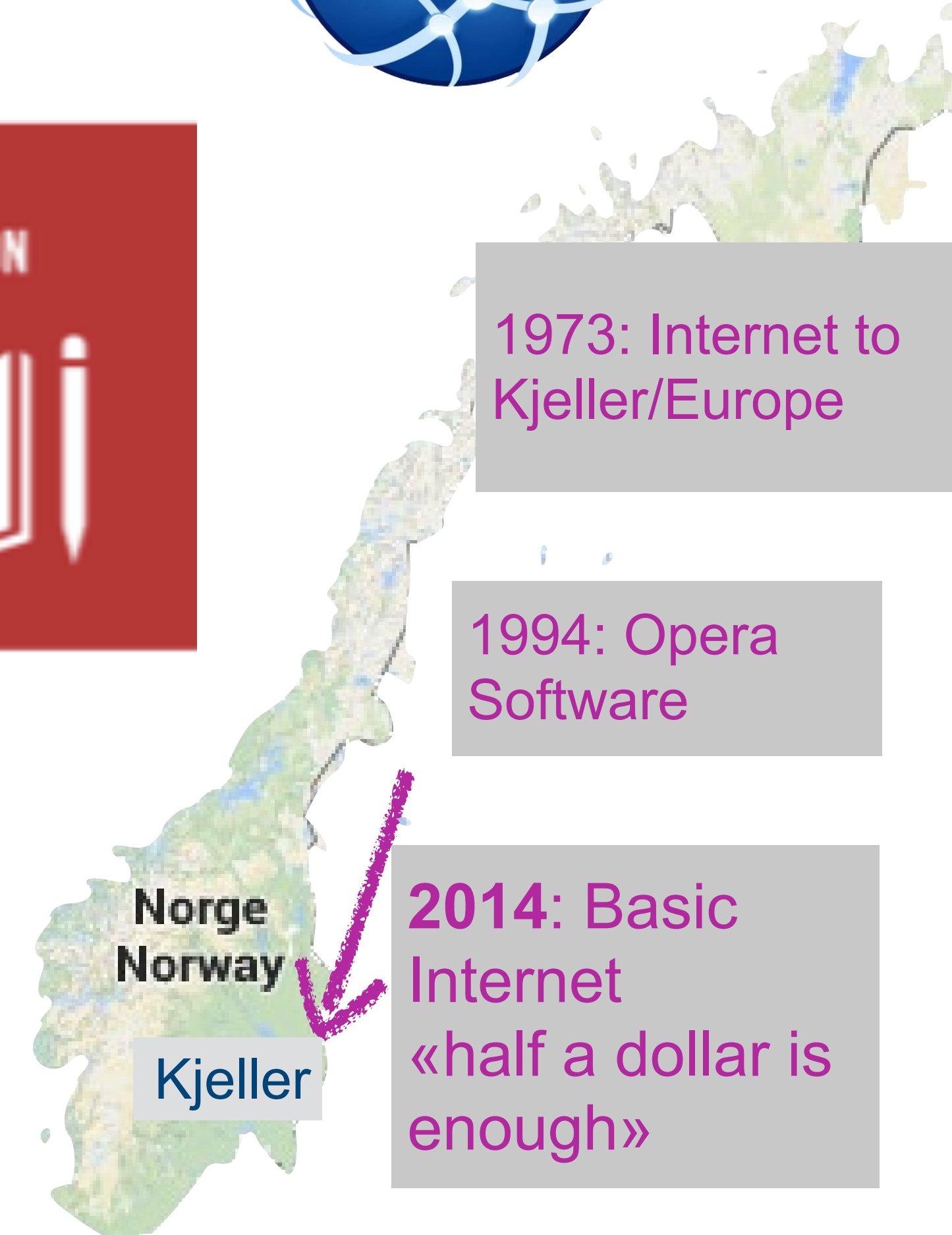


[Source: GSMA, Nov2015]

Motivation: “Need to close the digital gap”



- The Global Goals:
Norway is the secretariat for Quality Education
- Internet history
 - ➔ 1973 Europe through Kjeller
 - ➔ 1994 Opera Software
 - ➔ 2014 Basic Internet Foundation



“Internet is my teacher”

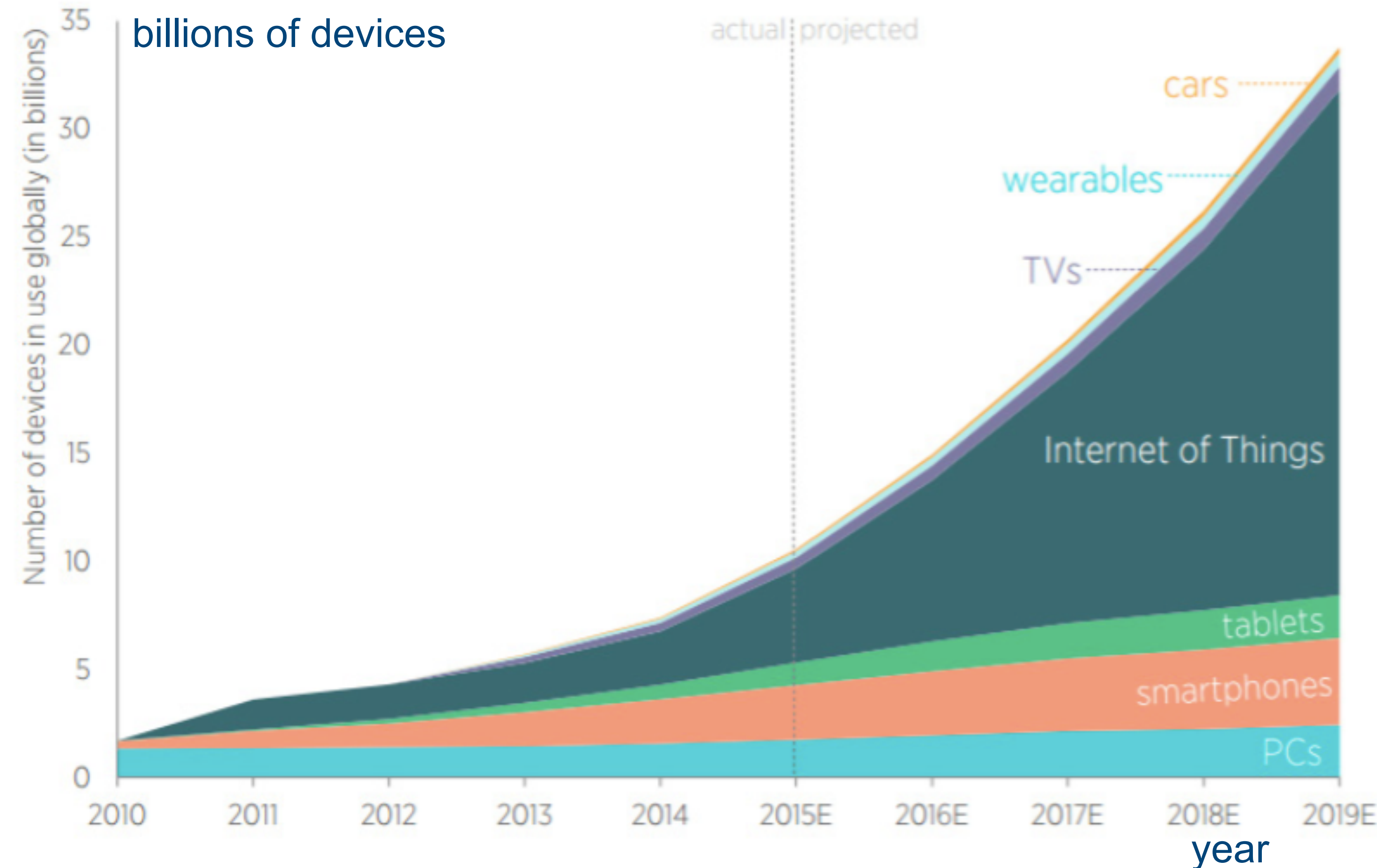
“I’m currently learning Python and HTML, so I can make a website for my parents’ business”



IoT expected impact

[Source: A. Thinner and A. Castillo, 2015]

- Smart home appliances, “wearables”, smart metering, autonomous vehicles, ...
- 10 billion (2013) -> 19 - 40 billion
- total global impact: US\$ 2.7 - 14
- ~3/4 of devices from IoT++
- ~1/4 from tablet, mobile, ...



Source: John Greenough, "The Internet of Everything 2015," *Business Insider Intelligence*. Produced by Adam Thierer and Andrea Castillo, Mercatus Center at George Mason University, 2015.

The vision of 2026

- “Digital and Inclusive Society”
- Networks adopting to service needs
 - ➔ Security, privacy, dependability
- “the Road Network Infrastructure”
- Information-Internet
 - ➔ free and open access
- Broadband services
 - ➔ authenticated access
- A common goal for the Open Innovation Lab

Business model “road access” for the Information-Internet



multimedia++

Poverty and stability

- 80% GSM coverage, but only 20% mobile broadband (0.4% cable broadband)
- “Everything is connected”: social, politics, climate and economy
- “money is not the decisive faktor” [@Civita]
 - ➔ “security/rights, peace and development”

[source: Nikolai Hegertun, Civita_10_2016 report]

- >2 billion people with less than 3 US\$/month, ~1 billion people with less than 1.5 US\$/month [World Bank, 2016]

