

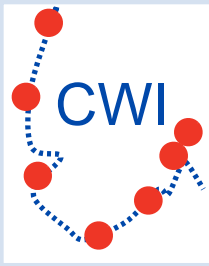
MOBILITY 2013
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Providing Internet Access to Emerging Economies - The Business of Free Access

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Outline

- Internet developments
 - Status today
 - Research versus Needs
- The vision
 - Internet.org
 - Nextelco Foundation
- Business models for Free Information access
- The way ahead
 - Technology, Pilots
 - Collaborations
- “It’s up to us to make the change”

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- Research and Education at Kjeller
- 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.

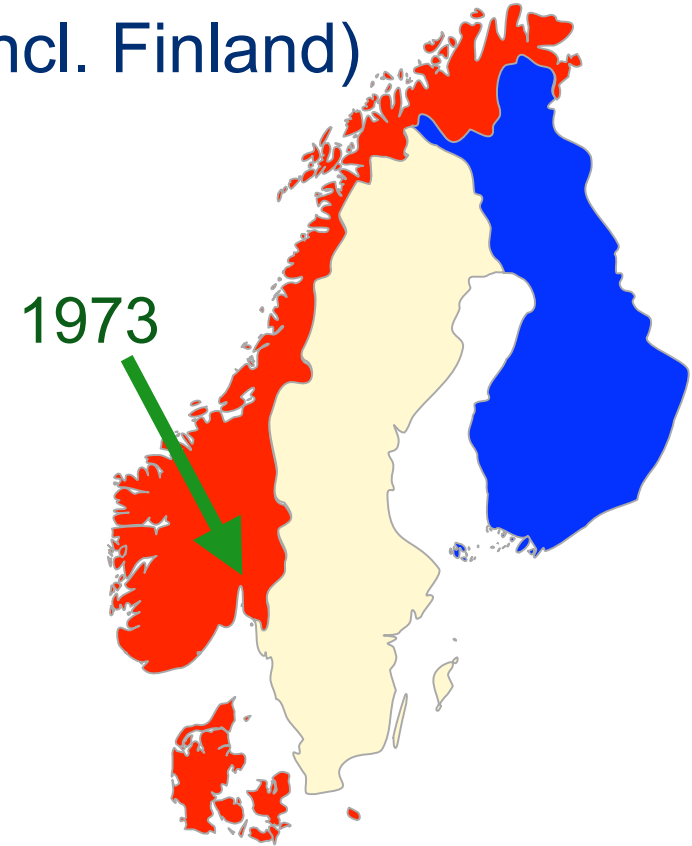
At that point, two satellite links, across the Pacific and Atlantic Oceans to [Hawaii](#) and [Norway \(NORSAR\)](#) had been added to the network. From Norway, a terrestrial circuit added an IMP in London to the growing network.

Source: Wikipedia



Scandinavia and the Internet

- The Internet - and Scandinavia (incl. Finland)
 - historical
 - today
- Internet impact for Scandinavia
 - digital divide
 - health, education
 - welfare



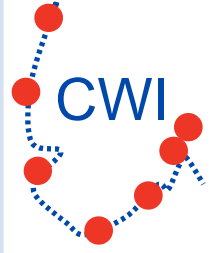
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The Internet and Scandinavia

- The first connection of Arpanet outside of the USA (and Hawaii) was to **Scandinavia** (Kjeller, June 1973)
- List_of_Internet_pioneers [Wikipedia]
 - Yngvar Lundh, Paal Spilling
- Application development
 - .php, OpenSource, Linux, Skype, Spotify
 - OperaSoftware, FAST Search
 - Nokia, Ericsson
 - Telenor, TeliaSonera
- Mobile Internet:
 - GSM
 - Service adaptation



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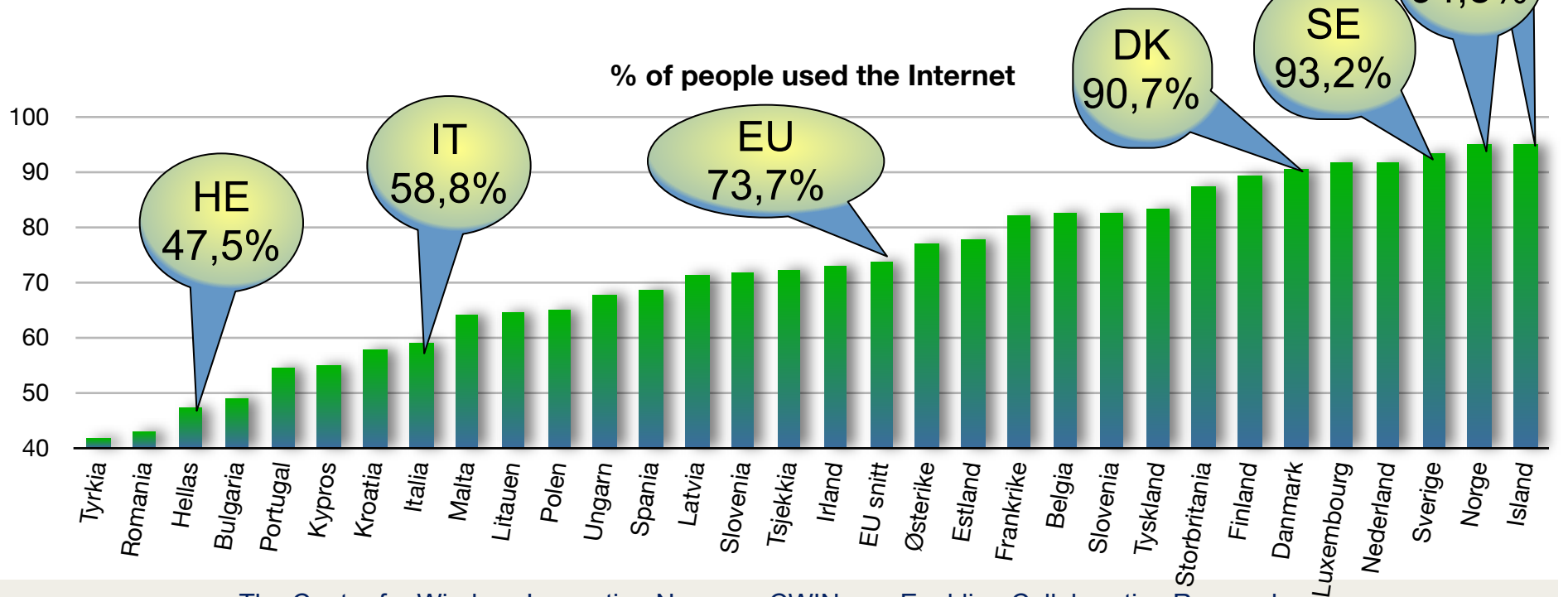


Internet creates welfare

[Robert Madelin, Directorate-General for Information Society and Media, EU commission, Aug 2011]

- * "use of IT in a proper way can increase effectiveness with 30-40%"
- * "we are good in technology development. But access to venture capital is bad in Europe as compared to the USA".

[Aftenposten, 3. October 2011] gunhild@aftenposten.no



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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.



Reality



Today, the Internet isn't accessible for two thirds of the world. Imagine a world where it connects us all.

[Source: Internet.org]

Digital Divide

- Limited Internet access (in the World)
 - Network missing
 - Too expensive
 - Revenue driven

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Internet.org

- Driven by the global industry
- Targeting
 - Affordability
 - Efficiency
 - Business Models

No one should have to choose between access to the Internet and food or medicine.

ERICSSON

Ericsson is a world-leading provider of communications technology and services.

MEDIA TEK

Media Tek Inc. is a leading fabless semiconductor company for wireless communications and digital multimedia solutions.



Opera products enable more than 350 million Internet consumers to discover and connect with the content and services that matter most to them.

SAMSUNG

Samsung is a global leader in technology, opening new possibilities for people everywhere through relentless innovation and discovery.

facebook

Facebook's mission is to give people the power to share and make the world more open and connected.

NOKIA

Nokia is a global leader in mobile communications whose products have become an integral part of the lives of people around the world.



Qualcomm is a world leader in 3G, 4G and next-generation wireless technologies.



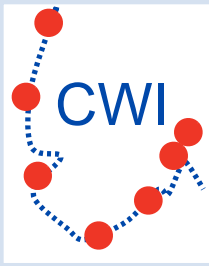
Imagine a world ...

"Envision the world where everyone can open his browser and get free access to Internet"



- access to
 - Wikipedia, Facebook, Google, News
 - for free
 - from a phone, a tablet
 - through the browser

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Outline

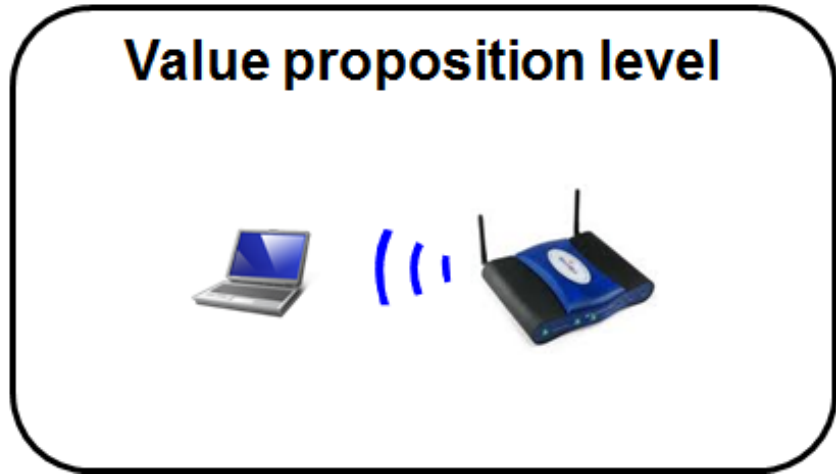
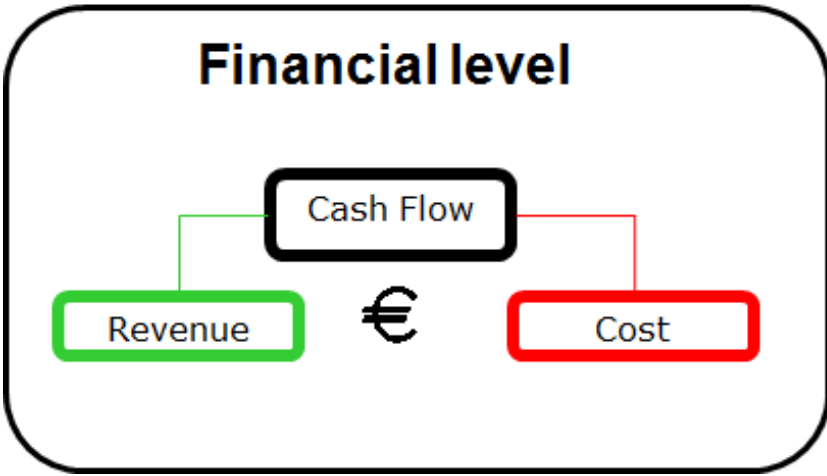
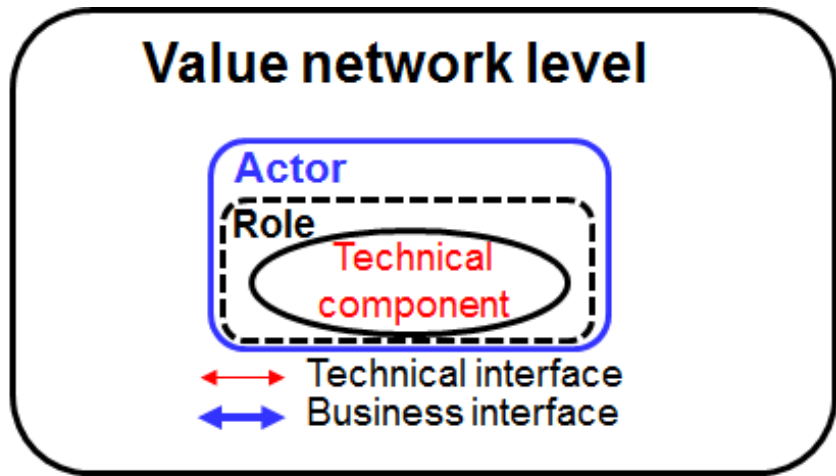
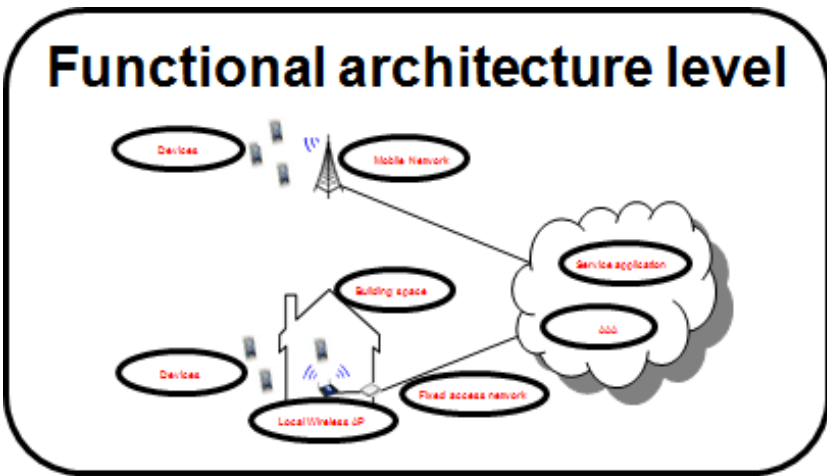
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Aspects of business models

[Ballon 2007]

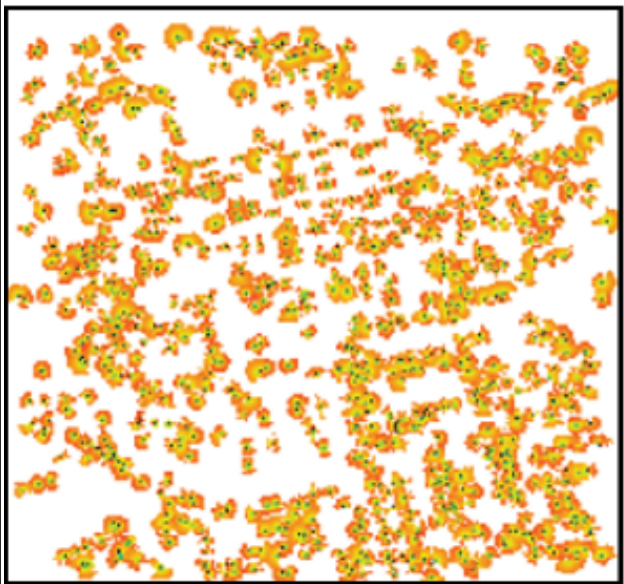




Business requisites

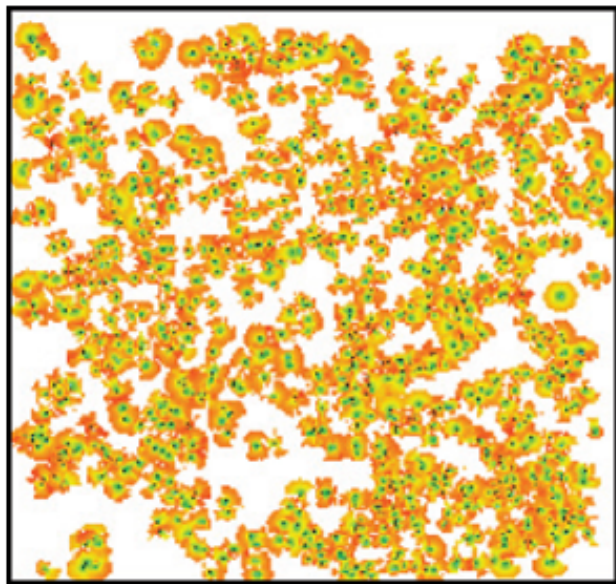
- Coverage

5 GHz



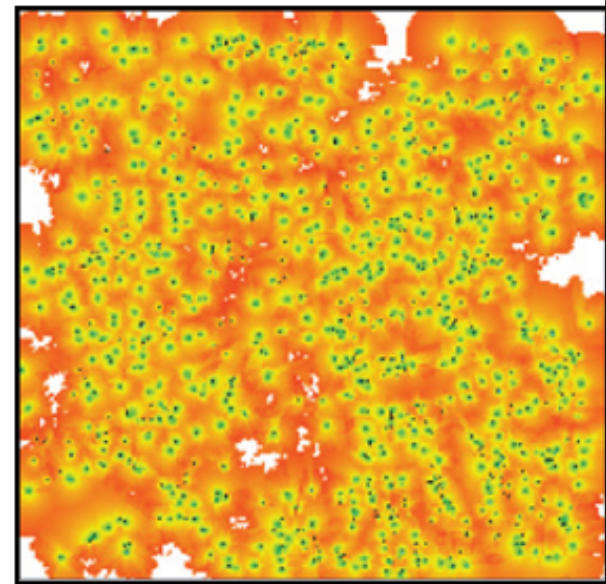
IEEE 802.11a/n

2.4 GHz



IEEE 802.11b/g/n

470 - 698 MHz
(TV white spaces)



IEEE 802.11af

[source: Fitch2011]

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Questioning traditional business assumptions



- Mobile Operators
 - start from city centre
 - revenue driven
 - Quality of service
 - voice & data
- “User-owned the network”
 - User runs access
 - Demand driven
 - Start from rural areas
 - web information only
 - user driven
 - someone to run backbone and distribution
 - (use mobile backbone)

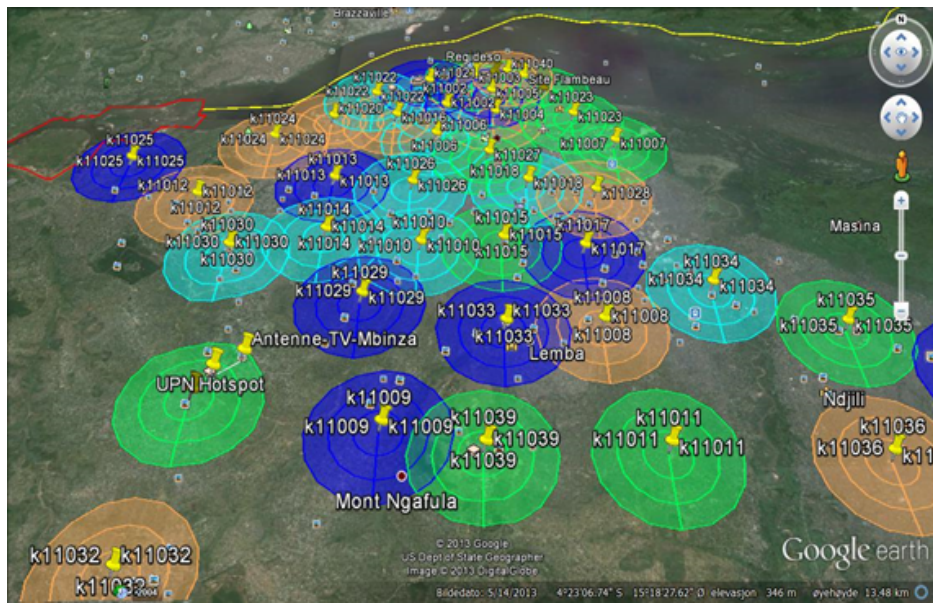
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Business analysis for Emerging Economies

- Remote sites with 500.000 inhabitants
- Revenue target: 4 €/month/user

- City coverage Kinshasa
- mixed: fixed, mobile, hot-spot concept

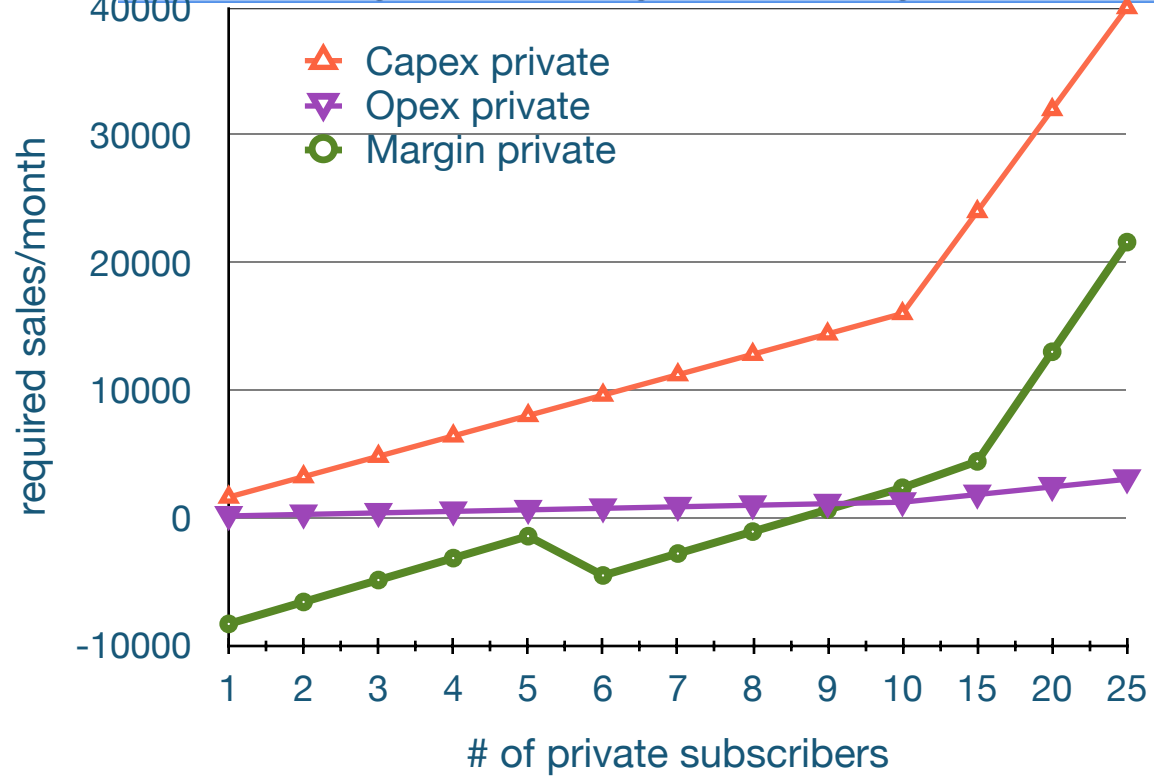




Business model Private (satellite) Internet

- Difficult revenue model for private satellite based Internet
- break-even with 9 installations/month
- cost of 240 Euro/ months only viable for institutions & business

Private Satellite Link	Equipment € (1 000)	Installation costs € (600)	Sales € 2 400	Installation sites € 800	Capex margin € 1 600
Private Satellite Link	Satellite costs € (120)	Subscriber Income € 240	Opex margin € 120		





Business model: Hot-spot in cities

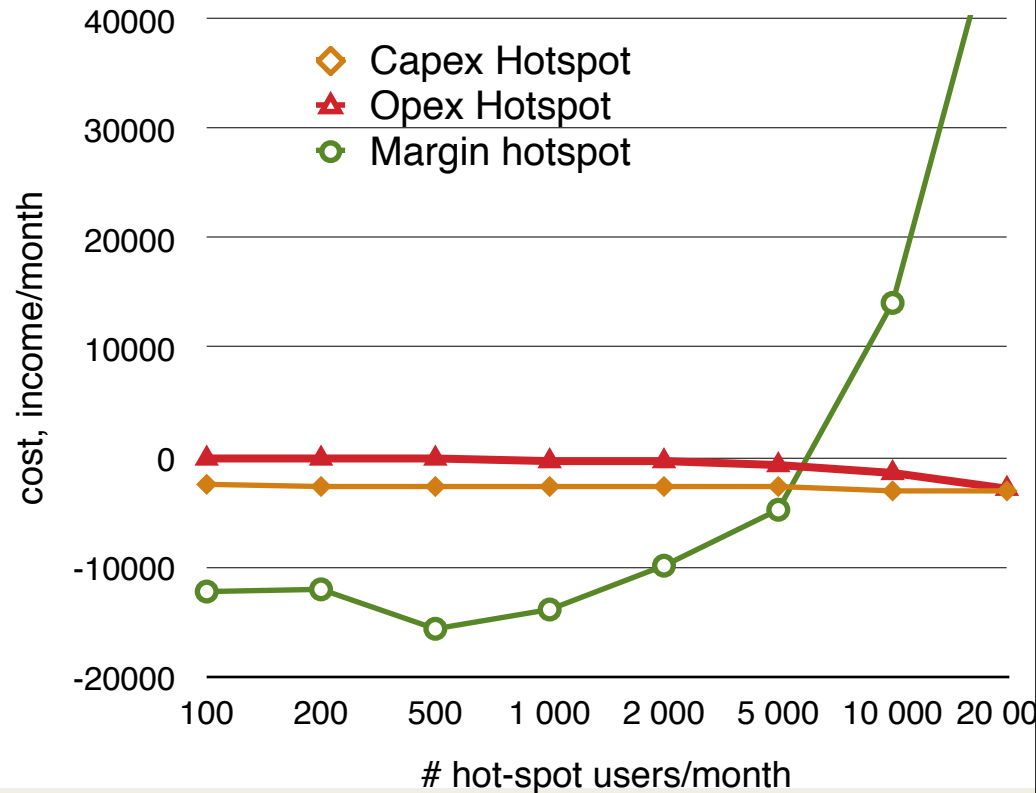
OPEX - hot spot price plan

	Satellite costs
Satellite Link	€ (120)
Wimax Hotspot	€ (40)
Wimax-WLAN hotspot	€ (27)

CAPEX price plan

	Equipment	Installation costs	Capex margin
Satellite Link	€ (1 000)	€ (600)	€ (1 600)
Wimax distribution	€ (600)	€ (80)	€ (680)
Wimax-Wifi	€ (333)	€ (200)	€ (200)

- assumed average income of 4 €/user
- requires 5000 users/month





Novel concept: Free Information Access

- Affordability
 - Free information:
Web, Facebook, News
 - no subscriptions
 - no hassle with username/
password
- Authentication/Voucher
 - Video, TV, Music, Download
 - “I pay for what I need”:
 - 1 hour, 1 week
 - 20 MB, 100 MB



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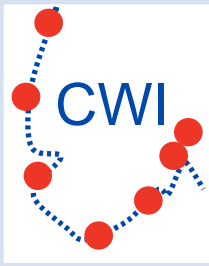
Free Information access: Removing the digital divide

- Societal aspects
 - everyone has access to information
 - on all WLAN (& mobile) networks
- Technical requirements
 - browser with just text & picture
 - compressed content to be transmitted over radio
 - proxy-based splitting of information



- Example: Opera Mini
 - encrypted request from Opera Mini browser
 - Opera access Web page, removes animations, and compresses the page
 - Compressed page is sent to device
 - typical 80% reduction
- Usage results
 - 4 MByte average user
 - 20 MByte max user/month

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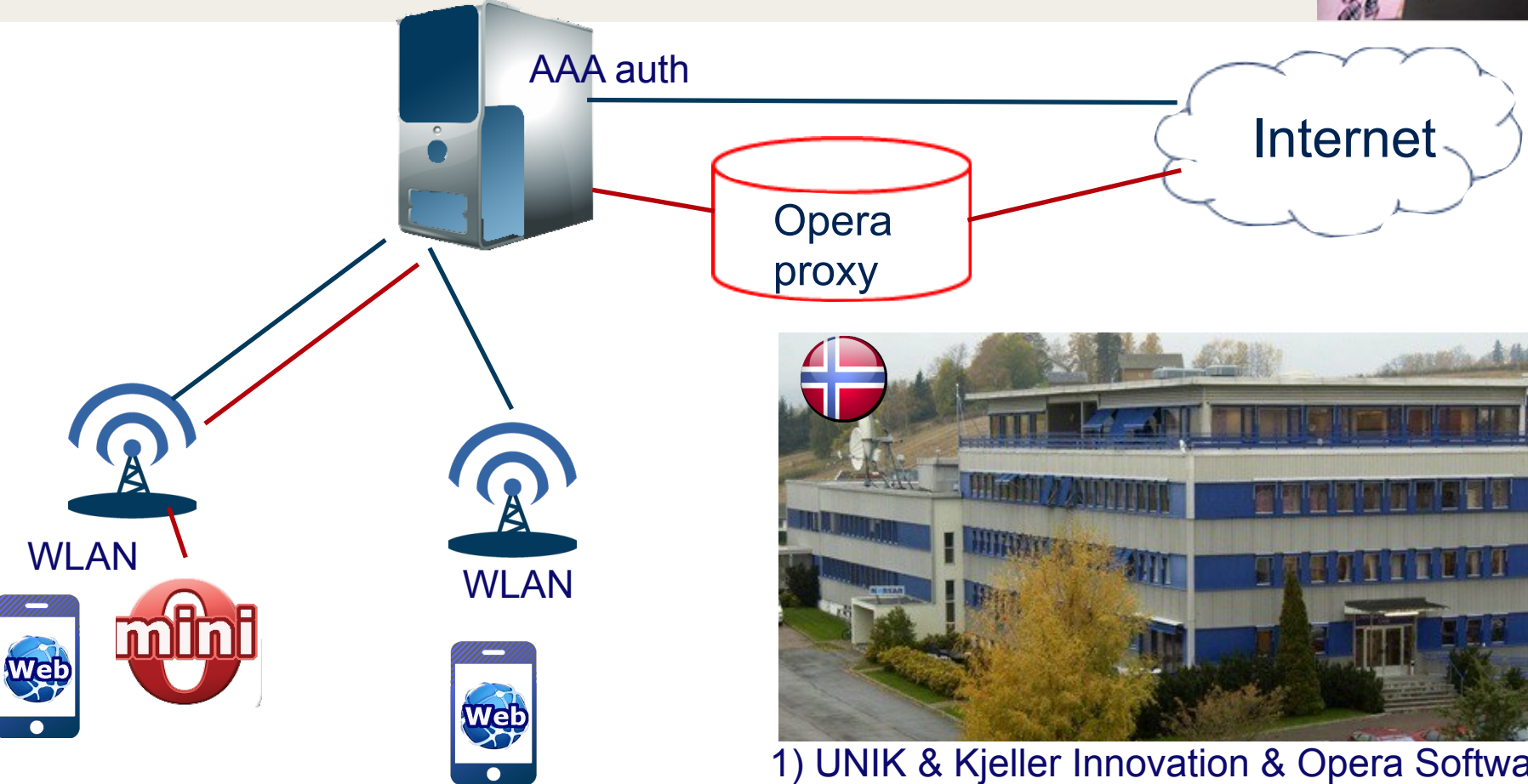
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Pilot: Free Information access



- 1) UNIK & Kjeller Innovation & Opera Software
- 2) EDUROAM - Research networks
- 3)

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Pilot: Implementation in DRC (Congo)

- 3 products
 - Satellite link
 - public Wifi access point
 - Sat.-based public Wifi access point
- Success technology usage
 - University of Lisala
 - Deployment at 4 other universities in Kinshasa (DRC)
 - 10 additional implementations



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Technology and Business Developments



- Extended partnership with IPXextenso++
- Integration with Mobile Operator business
- Solar-cell powered equipment
- combined solutions



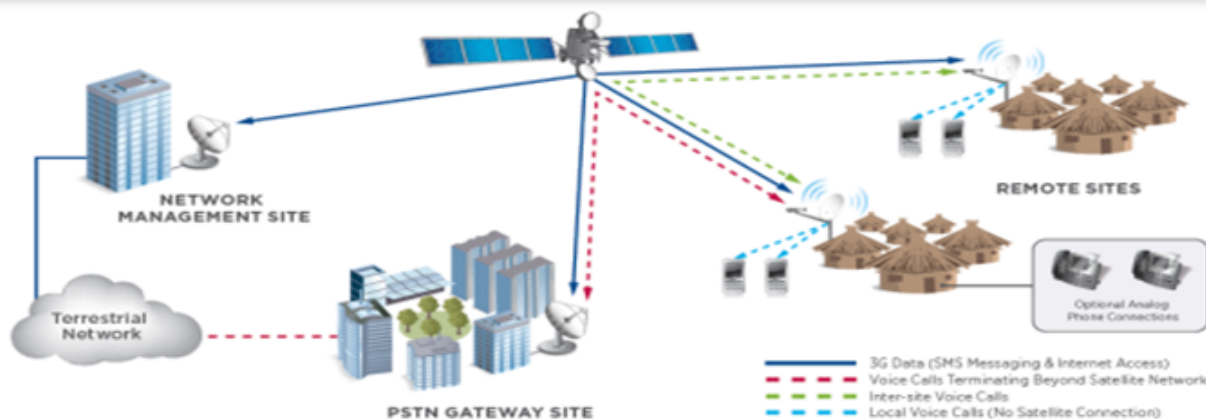
ASHOKA

Everyone A Changemaker™

NOV 2010, 000011001

Connecting Off-the-Grid Communities

VOICE & DATA INFRASTRUCTURE FOR FIXED & MOBILE SERVICES



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The goal: Business Ecosystem



Web Edu	Web Health	
mini News		You Tube

Access point	Access point	Access point
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Back-bone	Proxy	Billing
Satellite	3G/4G	

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Conclusions: Free access to Information

for a world:
"Where everyone
can open his
browser and get free
access to Internet"

No one should have to choose between
access to the Internet and food or medicine



CONNECT



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Conclusions

- Scandinavia has a long tradition for Internet-based developments
- Bringing Internet to the developing world
 - will foster education, health and innovation
 - will be the basis for development and welfare
- Proven technical solution
 - access points to the two thirds who don't have Internet
- Free Information access
 - no real network load (4...20 MByte/user/month)
 - pilot together with Opera Software & Kjeller Innovation

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[source: Pål Grønsund, 2013]

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