

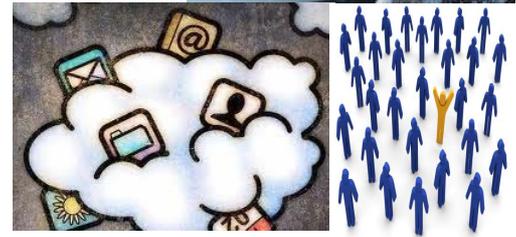
Ultra-broadband and Services of the Future

Expectations and challenges

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2nd Econ@Tel Public Workshop

COST ACTION IS0605: Econ@Tel A Telecommunications Economics COST Network

Budapest, 21-22 Sept 2011

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Overview

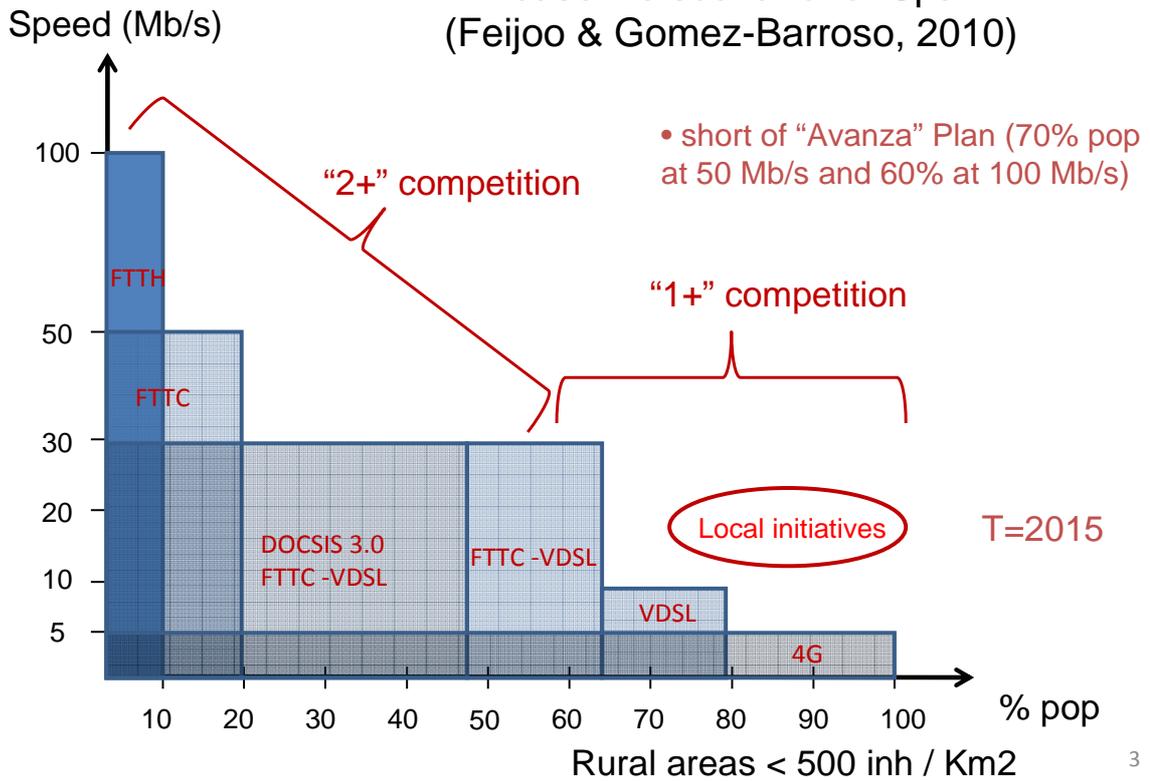


- Matching supply and demand
- What do we know about ultra-broadband services demand?
- Scanning new services
- Some conclusions

The supply side (in 2015)

A baseline scenario for Spain
(Feijoo & Gomez-Barroso, 2010)

Ultra-broadband Services



The demand side

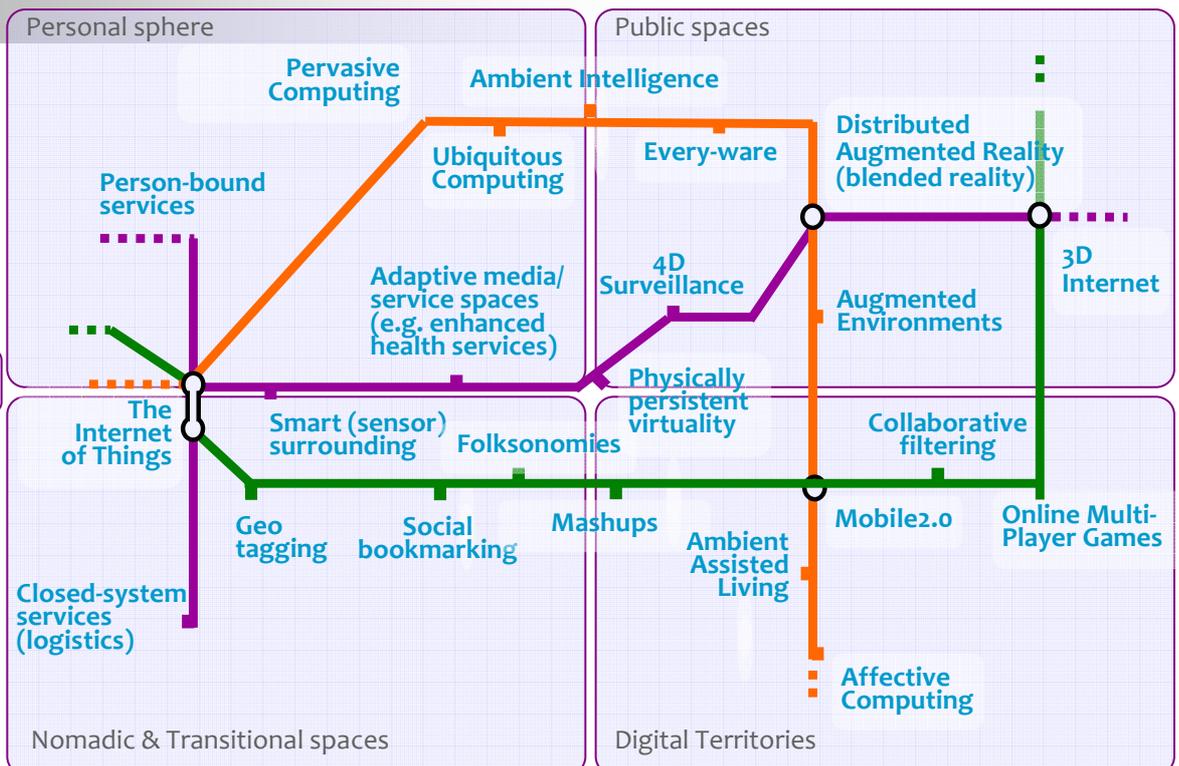
Ambient line

Application line

Web2.0 line

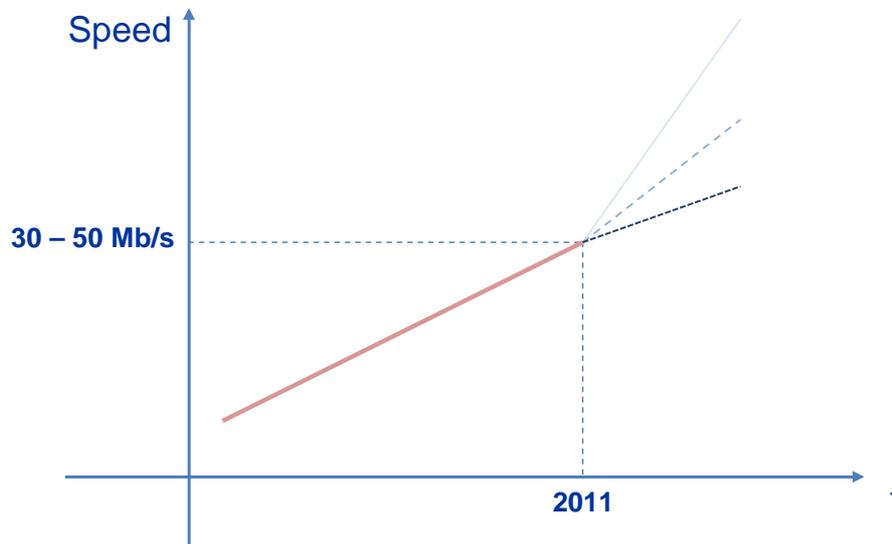
Contexts & Activities

Ultra-broadband Services



The evolution of broadband

- “Moving target”
- Dependent on users’ behaviour
- Current values and future expectations (Say’s Law?)



Ultra-broadband Services

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Japan / Korea

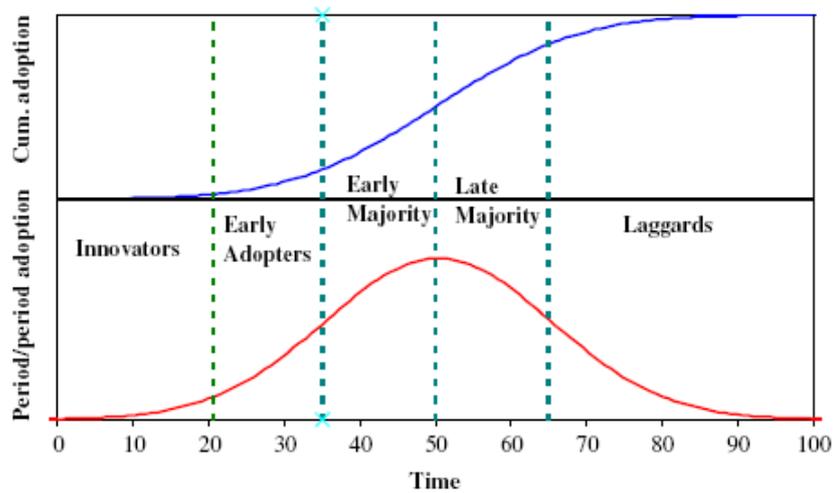


Ultra-broadband Services

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Demand forecast (1/2)

- Theory of adoption
- S-Curve
- Hypothesis: saturation of the market
- Hypothesis: ultra-broadband adoption will be similar to conventional broadband



Demand forecast (2/2)

- Typically 4 well-known services: Internet access, VoIP, IPTV, VoD (OTT Video)
- Many hypothesis to calculate the penetration of each service / each technology (fiber, xDSL, cable)
- Result: Demand per user
- Hypothesis: Usage and Max. traffic load per user
- Several QoS: Real-time, Best-effort, ...
- Result: Requisites for network
- Supply / demand mismatch in Spain: below average adoption and above average availability

Beyond conventional video

3D CONTENT	Detailed 3D modeling: <ul style="list-style-type: none"> - objects, buildings and facilities - urban areas and spaces - controlled environments and critical infrastructures
SIMULATION	Complex data, processes, workflows, ...
ADVANCED VISUALIZATION	Real-time rendering and visualization of immersive contents
TOOLS & APPLICATIONS	Serious Gaming Collaborative Tools Virtual, Augmented and Mixed Reality Real time bidirectional communication Advanced monitoring and control solutions



Immersive TV

Immersive TV - Audiovisual immersive contents as the paradigm for future entertainment (AVANZA-Tractor, 2010-2012).

- Production of media contents
- Manipulation, codification and transmission
- **Reception and interactive visualization**
- **Prototype for final users**



Online gaming

- Gaming equivalent of cloud computing.
- The game is synchronized, rendered, and stored on a remote server and delivered online.
- A low-end computer, as long as it can play video, may be used to play any kind of game
- 1.5 Mb/s connection will be needed to display games in SDTV resolution (Wii) while 4-5 Mb/s will be needed for HDTV resolution (Xbox 360, PlayStation 3).
- MMORPG



- ➔ Future evolution of software games in “Born digital / Grown digital: Assessing the future competitiveness of the EU video games software industry” (De Prato, Feijoo, Nepelski, Bogdanowicz, Simon, 2011)

Cloud computing



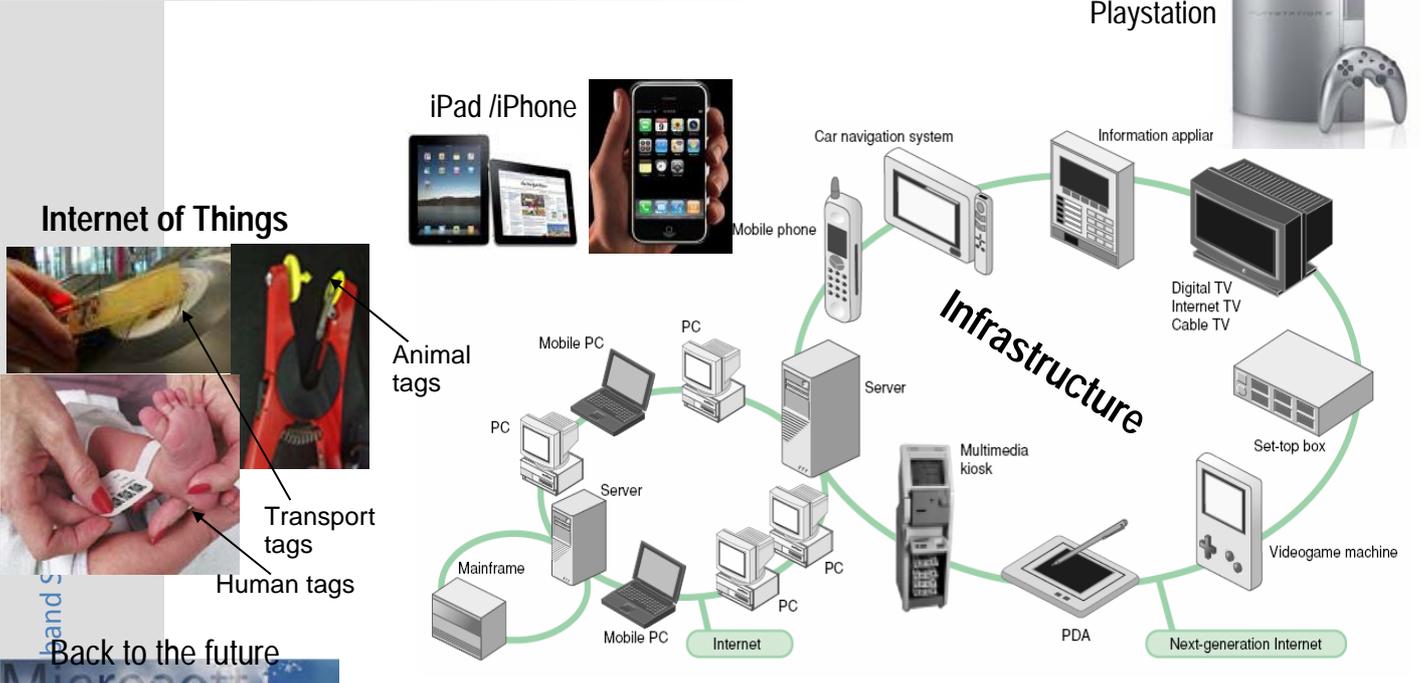
- ➔ Use and access of remote computational resources
- ➔ Sharing “resources”
- ➔ Outsourcing
- ➔ Virtualization of services
- ➔ Productivity services but also leisure (media and content)
- ➔ Remote hard-drive (current hard drives with average read / write speeds of hundreds of Mb/s and increasing with solid-state hard drives)
- ➔ Simplicity of customer equipment

Peer to peer services



- ➔ Distributed architecture
- ➔ Unclear evolution
- ➔ Potentially useful for more efficient distribution of content
- ➔ Business model pending

Internet of things and Internet of the future



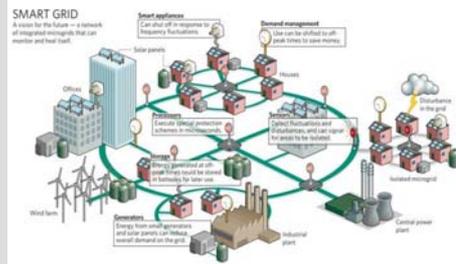
Various generations of Computing devices interconnected via wired or wireless technologies, facilitating access to a vast variety of applications enabling enhanced access, control, info-tainment, public services

eServices and Digital Economy



Ultra-Broadband Networks Infrastructure conditions

Cross -border / -sector, Interoperability, standards; Trust, security/privacy; Innovation, Business models



Smart Grids

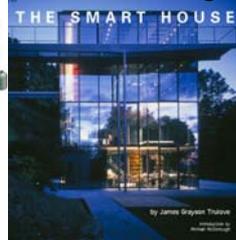
Internet of things



Smart Cars



Smart Buildings



Social Networking



eHealth



eGovernment



eLearning



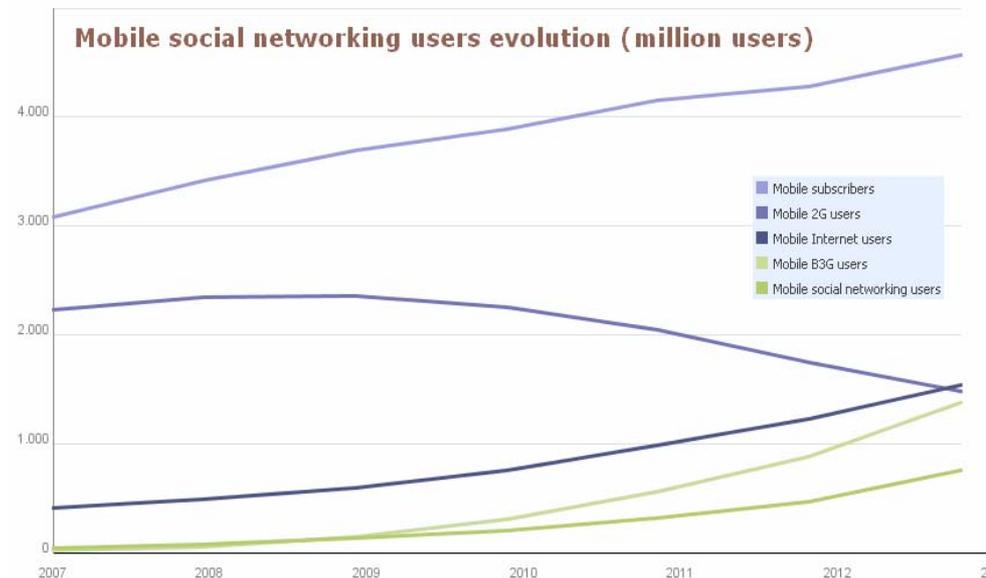
Digital Economy



Any business with electronic production and management processes that interacts with its partners and customers and conducts Internet transactions through Web technologies

Mobile services: complementary or supplementary

Drivers : available and affordable mobile broadband connectivity and smart devices



Source: own elaboration from data of ABI Research, EC, eMarketer, EITO, Eurostat, ITU, Juniper Research, Informa Telecoms & Media and Netsize

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➔ Twitter: 180% growth Jan 2010 – Jan 2011 (source: Twitter)

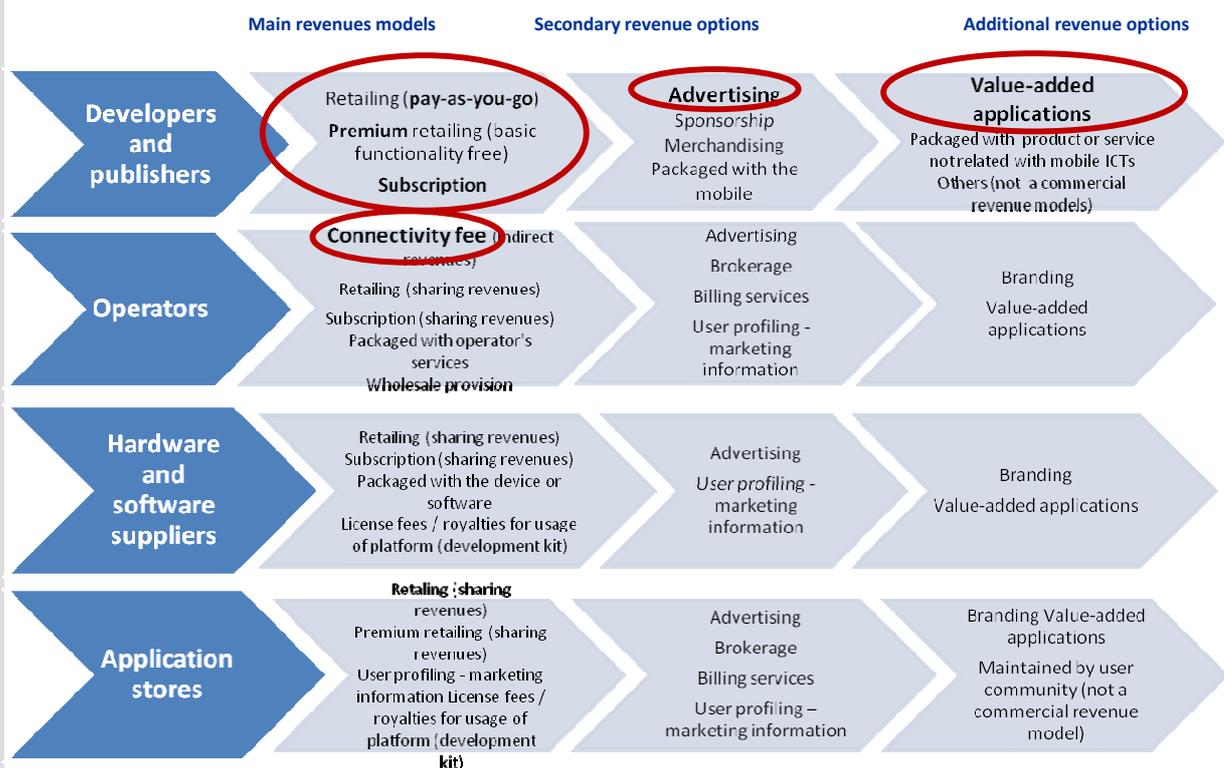
The (hugely important) role of devices and their market dynamics

Ultra-broadband Services



Experimenting with business models

Ultra-broadband Services



Digital living (1/2)

Digital content that is context-aware and/or mobile

MIT's 6th sense; MS KINECT;



Smart devices for enhanced travelling satisfaction and empowerment



Brain implant



Human-Machine interaction, wearable/implants

A Digital Me to enable medicine + transplant testing



Virtualisation, Virtual Physiological Human

vices



Shared social intelligence for enhanced decision-making

Social intelligence

Digital living (2/2)



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Ultra-broadband Services

- ➔ At the end when talking about services we are talking about lifestyles, consumers' expectations and social and economic changes
- ➔ The "long shadow of the future" (IPTS, 2011): prevalence of non-transactions, virtualization (infrastructures, platforms, services), complex value networks, fast pace of tech development

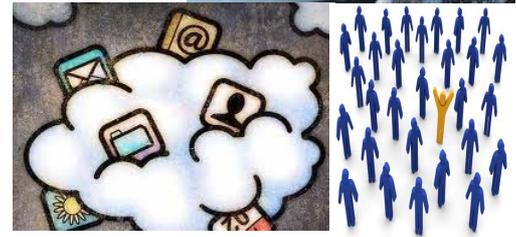
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