Interoperability and Innovation in the digital home: a European Perspective

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*i*2010 – The Master Plan for ICT

The importance of Interoperability and Standardisation

From a policy perspective

- Support Internal Market and deployment of pan-EU systems and services
- Facilitate competition and consumer freedom of choice (through interoperability and Open Standards)
- Stimulate emergence of EU positions while promoting global solutions
- Standardisation initiatives facilitate clarification on IPR ownership and remuneration of R&D investments

From a research and development perspective

- Powerful consensus building instrument
- Catalyser of exploitation of research results
- Interoperability should be an essential consideration in any system oriented research
- Efficient co-operation platform with other regions of the world

Evolution of the approach

Interoperability strengthens competition and enhances consumer freedom of choice Convergence and diversity of players make the standardisation process more elusive: over-proliferation of standards, more patchy solutions and legacy networks may endanger innovation

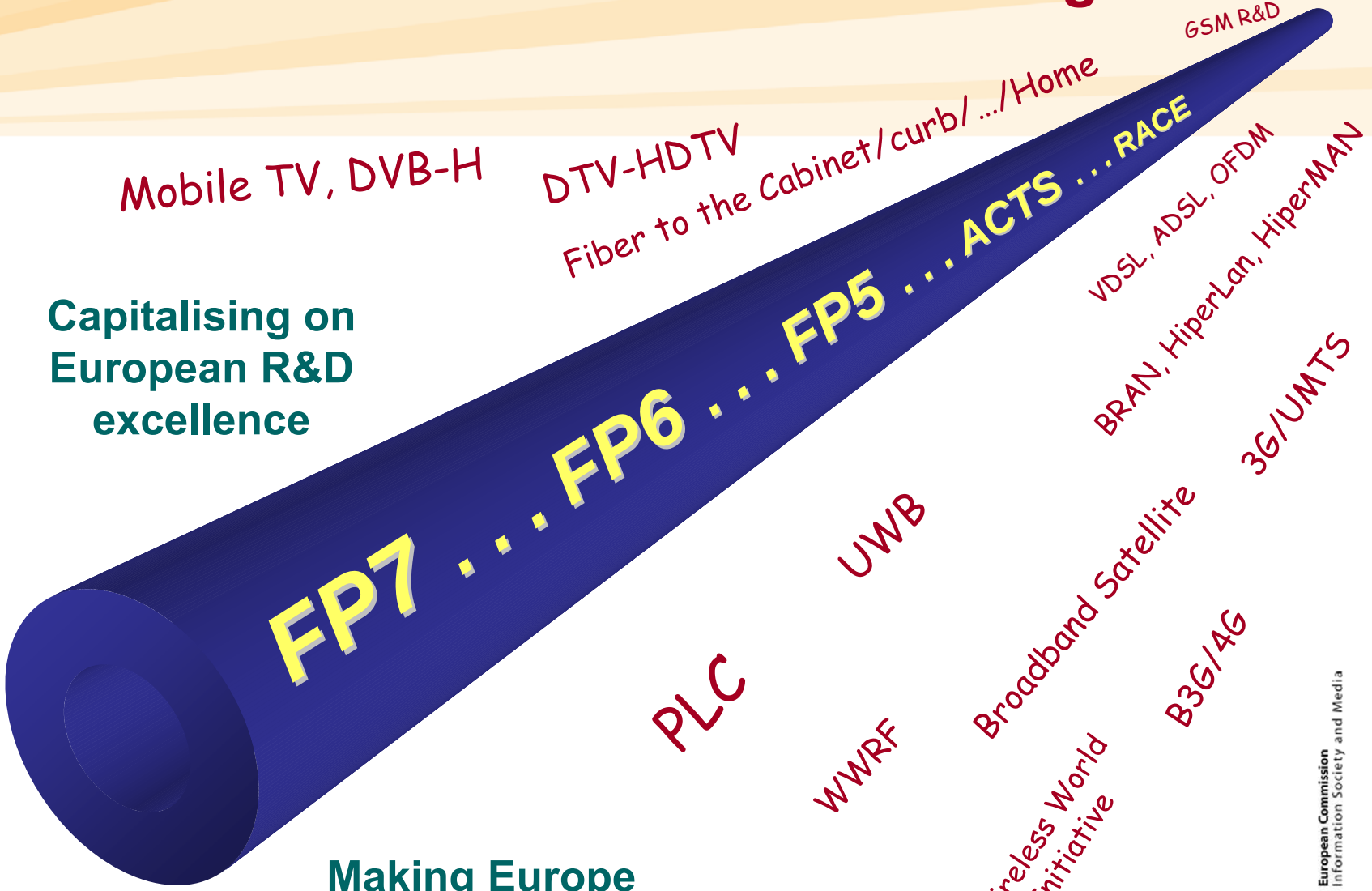
- **Internal Market driven perspective (EU-wide harmonisation) "à la GSM" with single standards approach → a market driven pro-competitive environment where several standards may co-exist. <u>Interoperability is a requirement</u>**
- **Deployment of pan EU widely adopted standards remains an option, e.g. mobile TV on-going debate; in this case, a co-ordinated approach of industry towards the regulator is key (see creation of EMBC).**
- **Time to market and economic efficiency (standards e.g. "de facto", not necessarily open);**
- **It is more and more crucial to find the right equilibrium point between internal market objectives, innovation objectives and competition objectives**

Accessibility matters

- Foster the emergence of innovative ICT-based products, services and systems for “Ageing Well”
- Create/leverage critical mass of research, development and innovation at EU level
- Improve conditions for industrial exploitation, in particular SMEs

- Action Plan on ***“Ageing Well in the Information Society”*** *June 2007*
- Support to **“Ambient Assisted Living”** Joint R&D Programme, *June 2007*
- European e-Inclusion Initiative “To be part of the Information Society”, *Nov 2007*

EU R&D and standardisation in Broadcast, Broadband and Mobile Technologies



Capitalising on European R&D excellence

Making Europe a world leader

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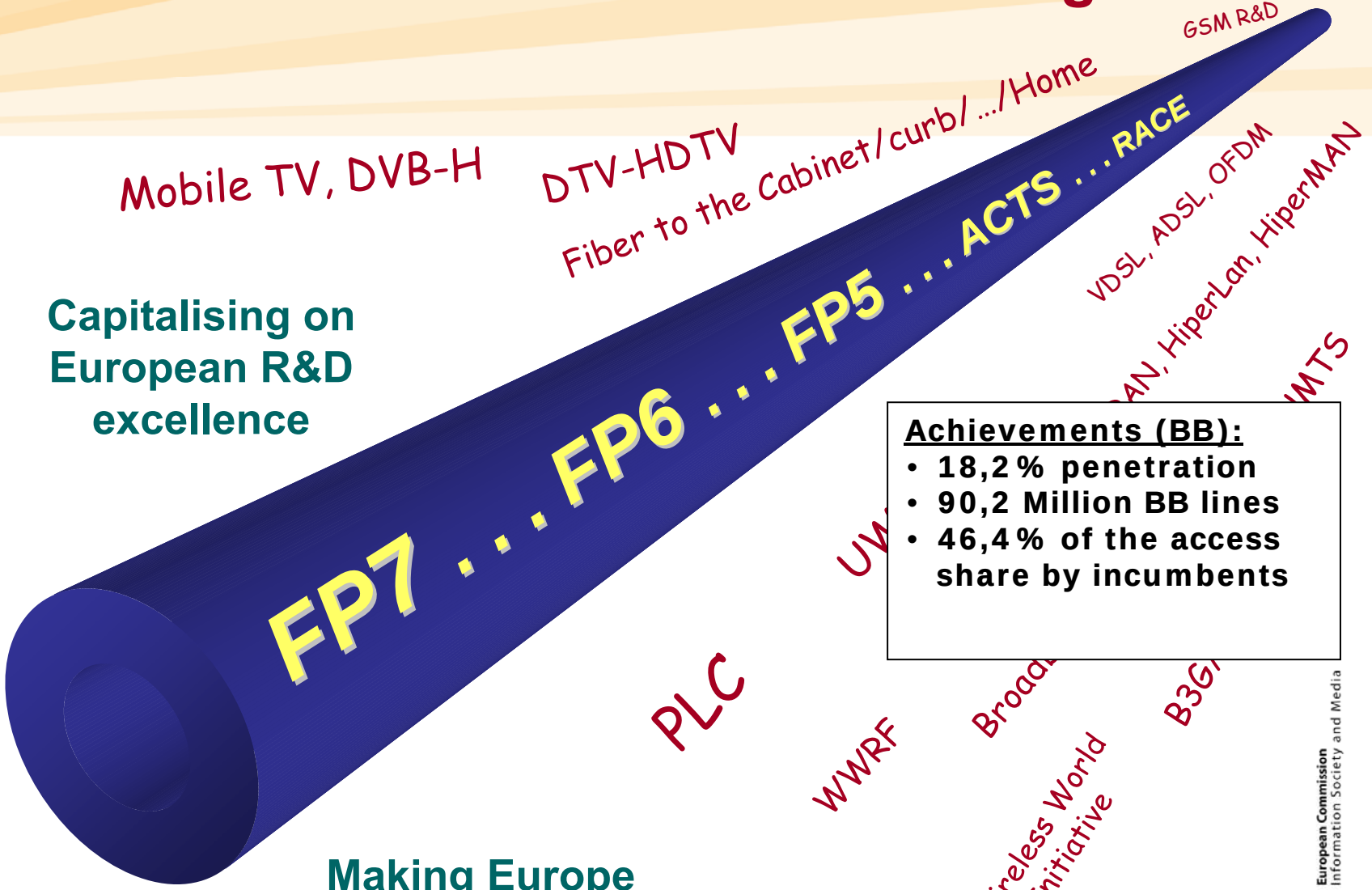
EU R&D and standardisation in Broadcast, Broadband and Mobile Technologies



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Achievements (BB):

- **18,2% penetration**
- **90,2 Million BB lines**
- **46,4% of the access share by incumbents**

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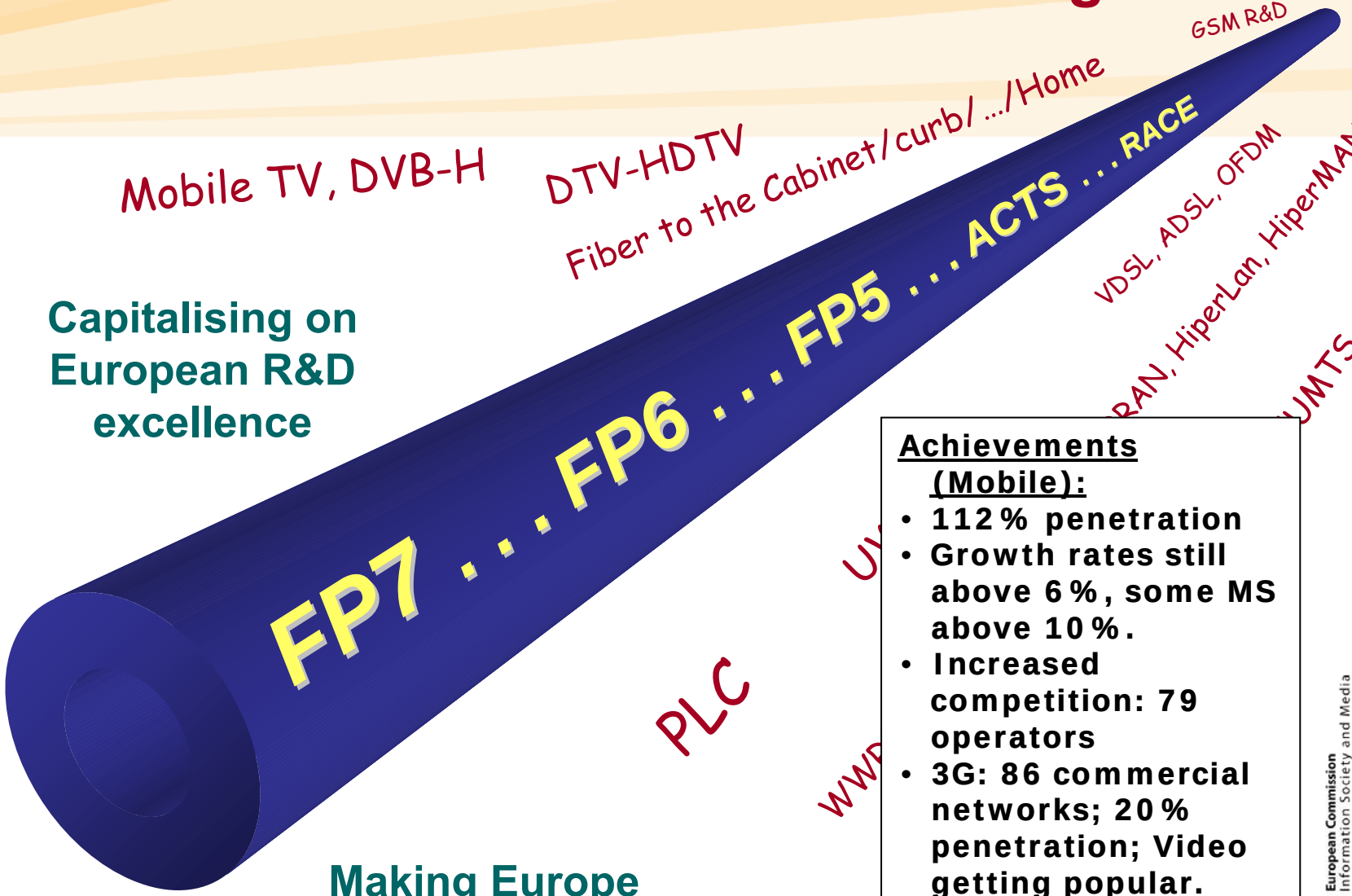
EU R&D and standardisation in Broadcast, Broadband and Mobile Technologies



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Achievements (Mobile):

- **112% penetration**
- **Growth rates still above 6%, some MS above 10%.**
- **Increased competition: 79 operators**
- **3G: 86 commercial networks; 20% penetration; Video getting popular. HSPA coming**

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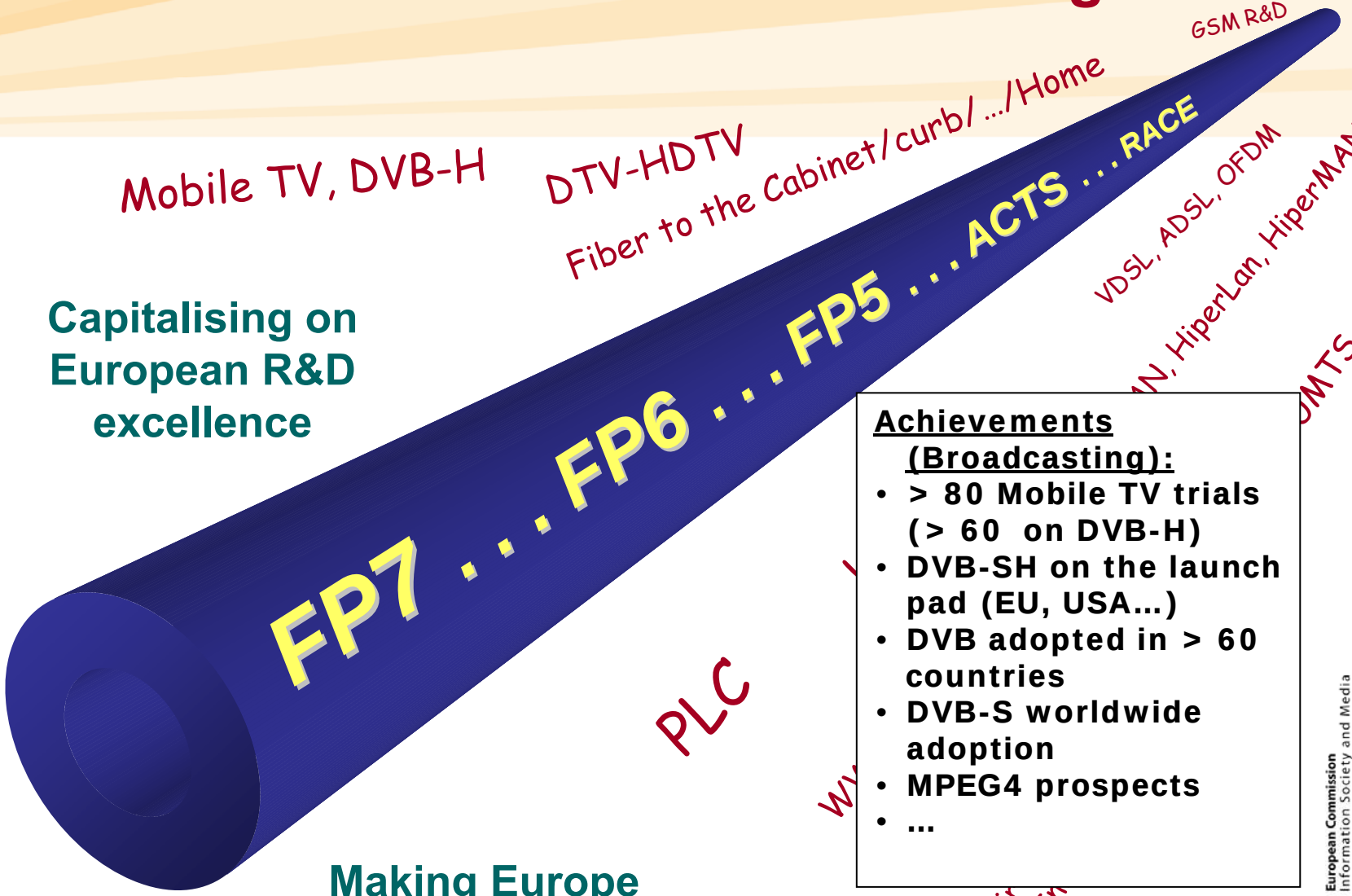
EU R&D and standardisation in Broadcast, Broadband and Mobile Technologies



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Achievements (Broadcasting):

- **> 80 Mobile TV trials (> 60 on DVB-H)**
- **DVB-SH on the launch pad (EU, USA...)**
- **DVB adopted in > 60 countries**
- **DVB-S worldwide adoption**
- **MPEG4 prospects**
- **...**

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European Technology Platforms

- Materialising EU industry commitment
- Putting in place large scale partnerships, including SME's and academia
- Demonstrating economic and competitiveness impact
- Defining the EU long term Strategic Research Agenda's
- Taking a system and end-to-end approach
- Acting as vector of strategic co-operation with third countries
- Implementing research and downstream deployment issues (regulations, standards..)

Platforms related to Challenge 1 "Pervasive and Trusted Network and Services Infrastructures"

European Technology Platforms should be prominent as "early warning" mechanisms towards optimised interoperability and standardisation-regulatory approaches

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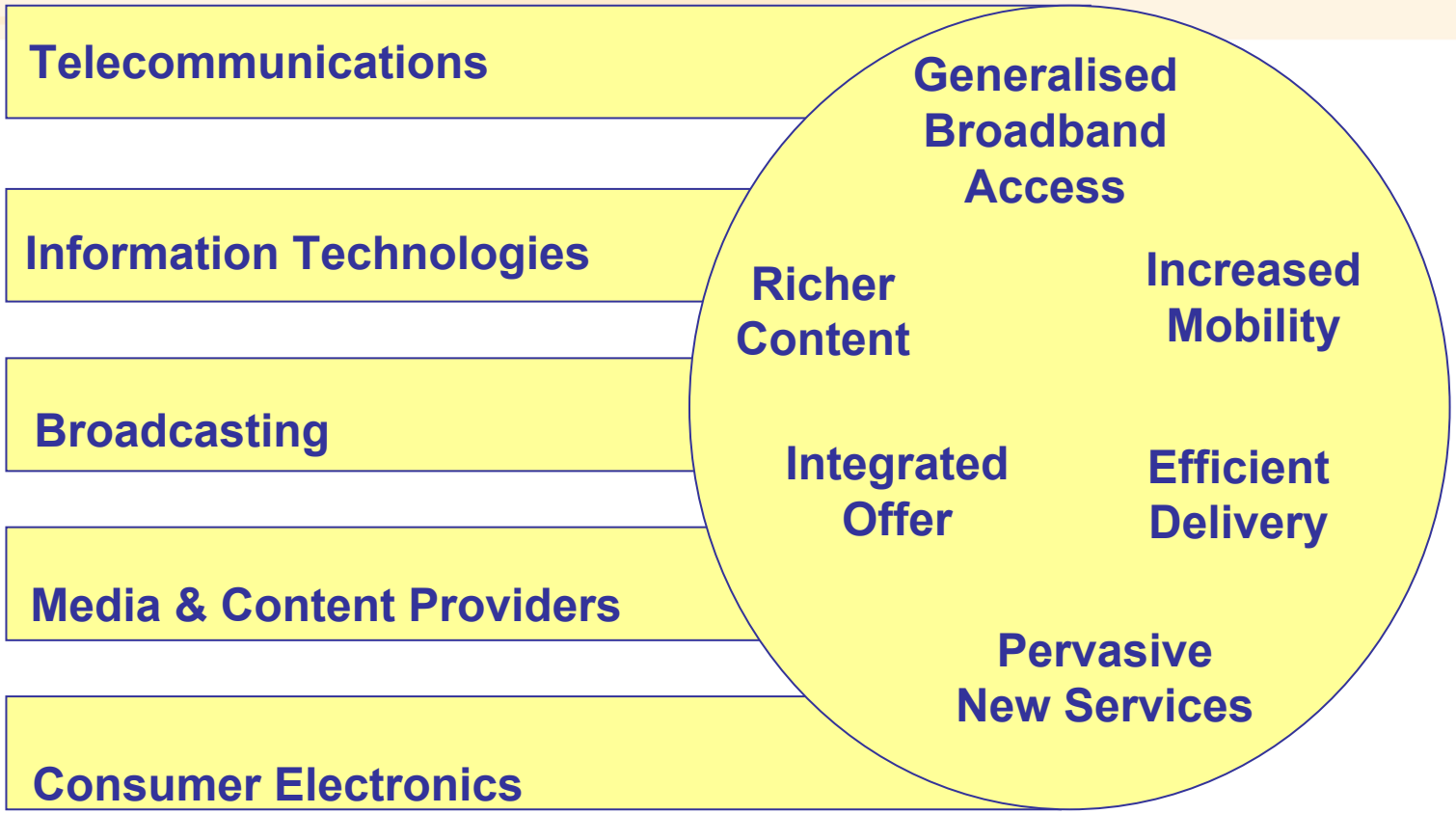
The ideal world of convergence as seen by NEM

***Key drivers**: Broadband (in 2015 >60% of EU households); Connected devices; Market demand (40% of time spent of media beyond current TV-> Alternative Universal Interactive Media Services on the Internet); Connected Homes*



Now → ***The NEM Converged Future***

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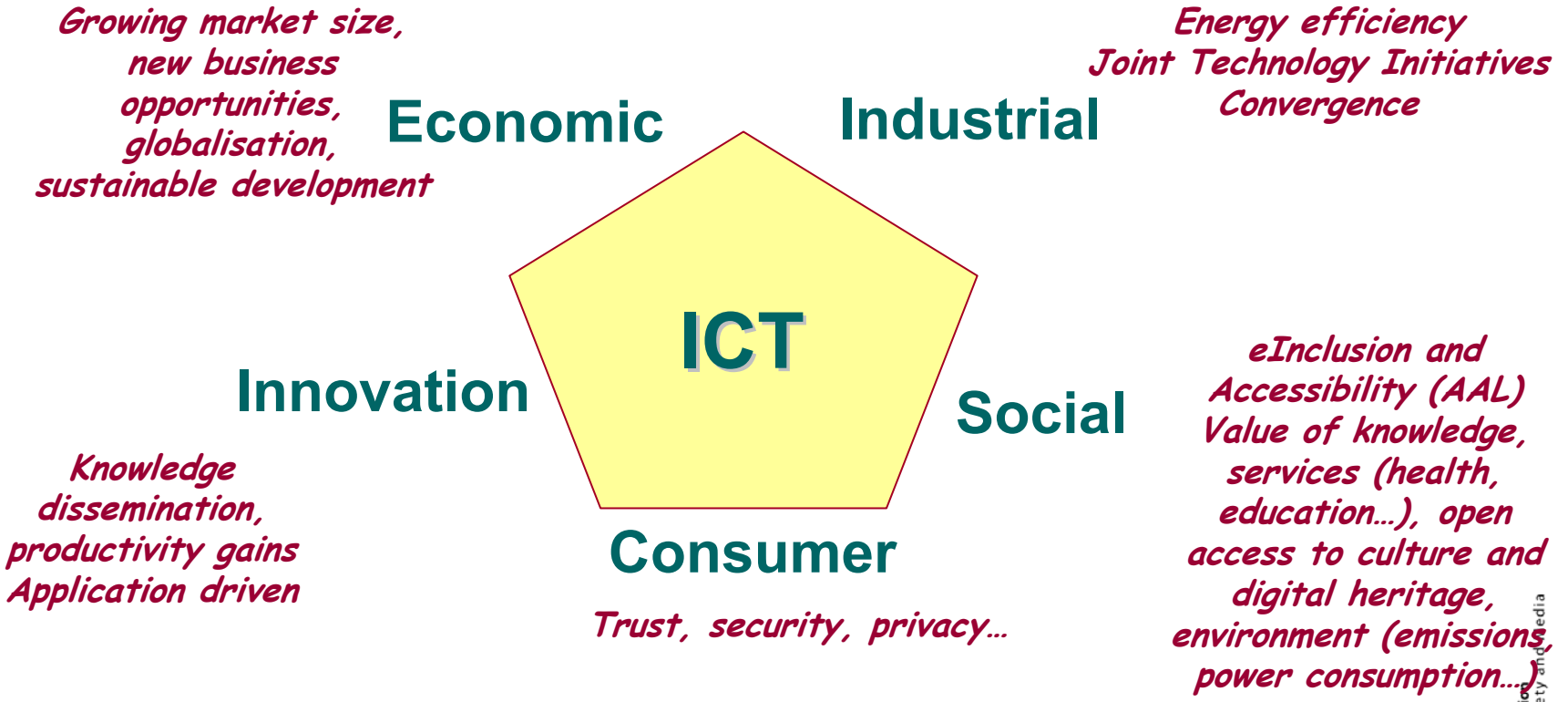
R&D responding to the strategic EU dimensions of ICT in the EU



New elements entailing new cooperation schemes:
Ambient Assisted Living (Article 169)
Joint Technology Initiatives (ARTEMIS, ENIAC)

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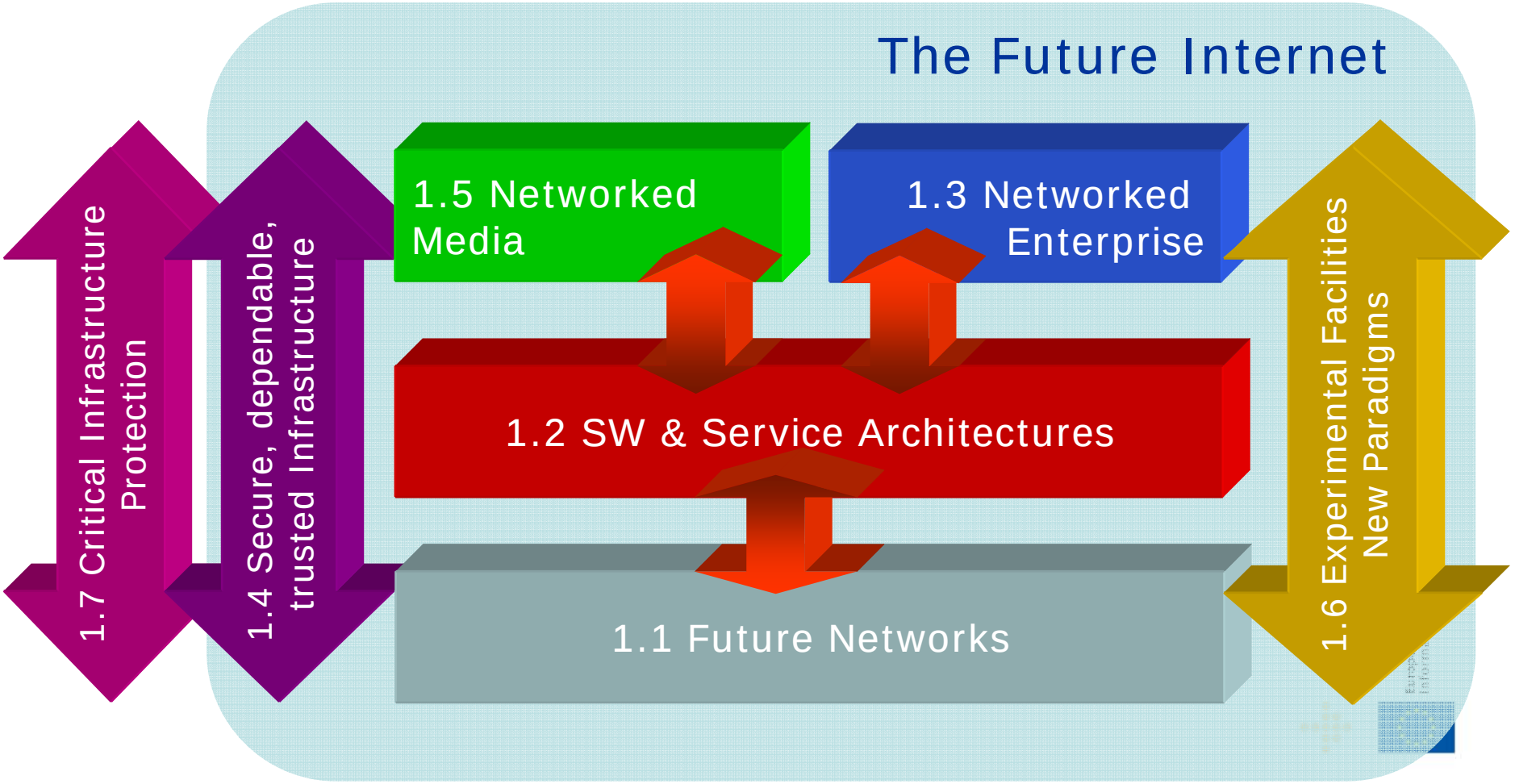
R&D Challenge in FP7: Pervasive and trusted Network and Service Infrastructures



FP7 ICT Challenge 1 – Pervasive and trusted Network and Service Infrastructures: *Context and driving forces for R&D*

- **Convergence introduces additional complexity:**
  - **Multiplicity of actors, technologies, business models, regional differences**
- **Evolution (NGN) coexists with disruption (Post-IP)**
- **Networked devices and sensors impact on the network and the organisations**
- **Flexible service platform and SOA (Service Oriented Architectures)**
- **Over-abundance of on-line content (networked): Search and P2P**
- **Distributed storage of media, new forms of contents (user generated, "social/community media", personalisation, ubiquity, 3D, virtual reality, gaming…)**
- **Wireless Communications and mobility: 4G**
- **Mobile Universal Internet**
- **Future Internet (inc. Media & 3D Internet)**
- **…**

The impact of Mobility

Nomadicity and ubiquitous service availability will impose the co-existence and interoperability of a range of evolving wireless technologies

- A plethora of wireless technologies exist, cellular, BWA, UWB, Bluetooth, Zigbee, WiFi, WiMax, Mobile TV, each with several declinations;
- « IPR » based technologies;
- Novel architectures are being contemplated: Cognitive radio networks, Ad-hoc, Sensor networks.
- Interoperability requirements are expected to grow, with significant impact on equipment cost; raising the importance of reconfigurability,
- Move towards broadband still an issue, current access rates still far from fixed infrastructure
- Will these multiple technologies converge, absorb, co-exist? Can the picture be simplified and also converge in the access portion?

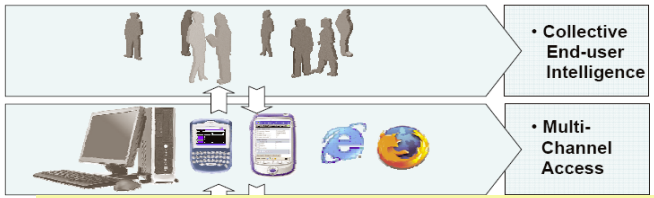
The Media Revolution

- 2006 “digital production”: **160 exabytes**, fuelled by user generated content, 12 book stacks from earth to sun;
- 6 fold increase expected by 2010, **990 exabytes** (pro + non pro)
- An ever increasing quality (Digital Cinema, Ultra HDTV, Computer Games…)
- Within 3 years, **70%** of created and archived content expected to come from users;
- Europe and US, about **75%** of content origin. Expected to decrease (in proportion), as Asia Pacific grows;
- Networked amplified phenomenon: **253 Million** e-mail boxes in 1998, **1.6 Bn** today;
  - Unprecedented connectivity (social media)
  - Terabyte personal storage (personalised media)
  - Device size, mobility/location (media on the move, context-aware), ubiquity

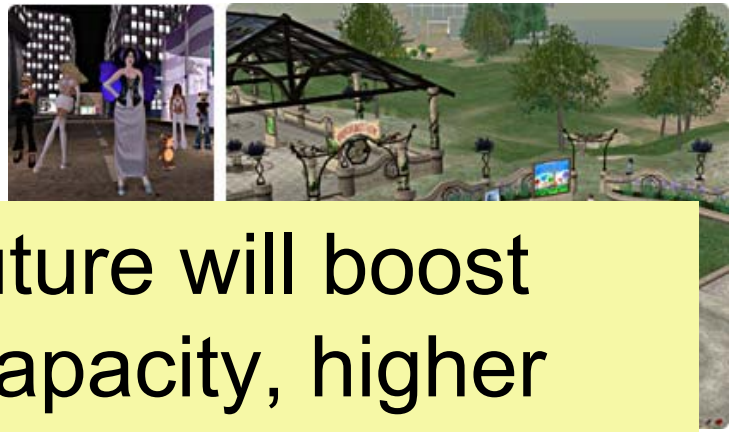
Source: IDC consultancy report,”The expanding Digital Universe” March 2007

The Future Internet as one of the main drivers

Internet of Services, Service Web



3D & Media Internet



Trust

The Internet of the Future will boost unlimited bandwidth capacity, higher computing performance, wireless access anywhere, trillions of devices interconnected, integrated security and trust, adaptive and personalised services and tools such as 3D semantic-based browsing systems

3GPP

3GPP

WiMA

Second Life

Some R&D challenges for the "Future Media Internet"

Internet of Services, Service Web

3D & Media Internet

- **Real-time collaborations** of professional and amateurs users and communities (create, annotate, share, retrieve…)
-Open, global **identity management platform**
-Open, adaptable **content-centric network**
-Ubiquitous, **always-on** connectivity enabling real time and **intuitive communication**
-Novel infrastructures and multimedia models to support collaborative, **interactive environments for 3D**, **multimodal, virtual worlds** and **simulated multi-dimensional physical processes**
-Pioneer Future Internet of creative media as a content-centric network allowing for real-time collaboration, multi-sensory context-based services, global access by multi-functional devices and open access to public content

Future Media Internet Brussels, Jan. 2008

http://www.alexandria.unisg.ch/EXPORT/DL/38496.pdf
http://www.itu.int/osg/spu/publications/internetofthings/
Second Life

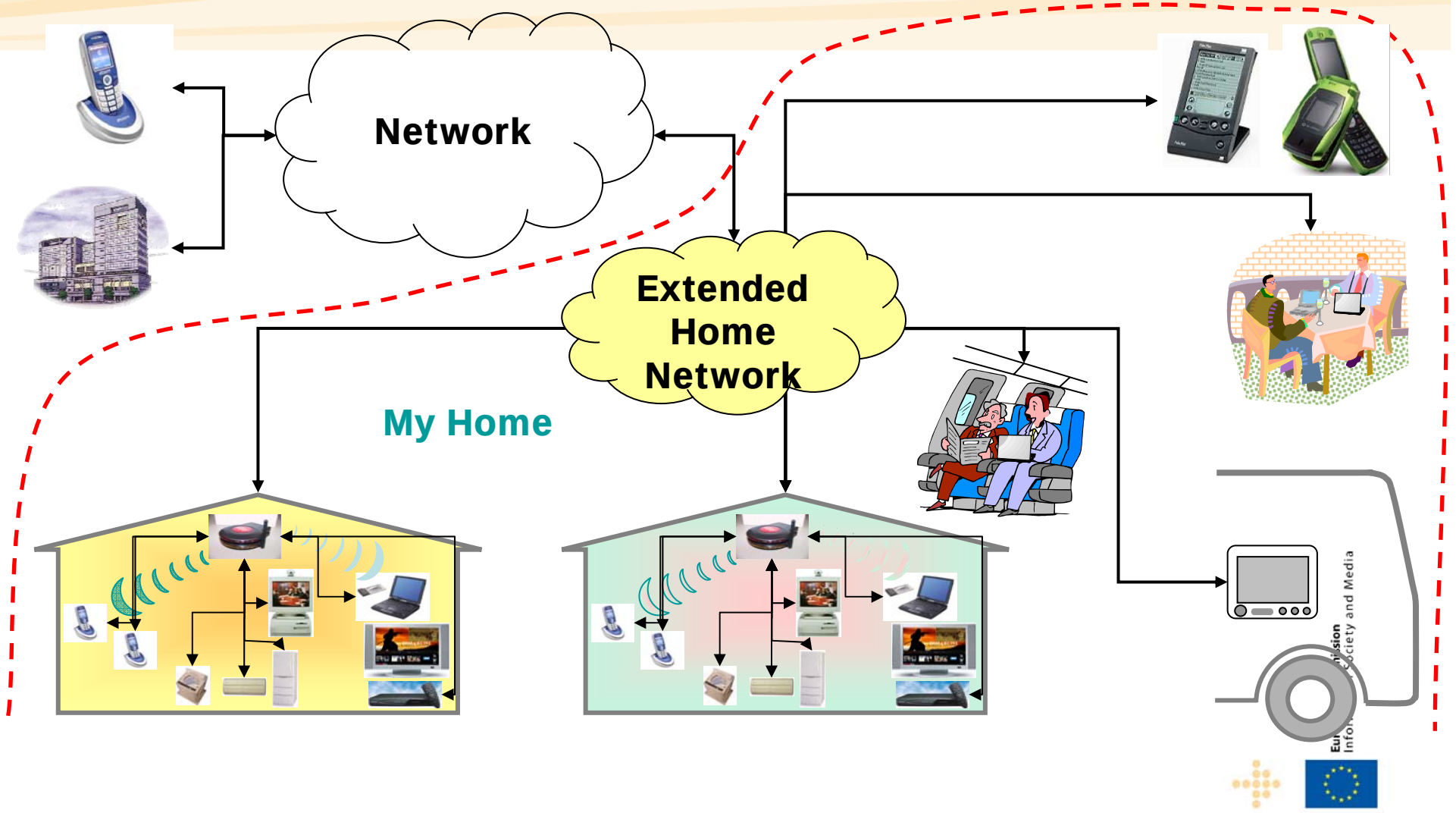
Internet of Things

Some explored R&D topics for future Calls Work Programme 2009-2010

- Enriched media experiences
  - at the “Extended Home”,
  - Community “intelligence” and Social Media
  - Personalisation of media services
- MM Search Engines
  - Interactive, scalable, multi-modal (and cross-modal)
  - Diverse Search Paradigms
  - Distributed Search
  - P2P overlays
  - MM search for media professionals …
- Innovative combinations of Advanced Search, P2P Technologies and Mobility leading to challenging application areas
- Massive Multiplayer on-line / Mobile Games
- Digital and Electronic Cinema (novel E2E solutions for creation, delivery and rendering)
- E2E solutions for the Future 3D & Media Internet
- Horizontal issues: International cooperation, Standardisation…

Consultation is open → Work programme 2009-2010 expected in November

An example “The Extended home”: MM home-like services anywhere, anytime



Current situation and issues : Home networks today and tomorrow

- Integration on the same network of previously physically separated services ⇨ convergence
- But:
  - Still lack of integration within the home, in particular home automation
  - Distribution patterns based on semi static one-to-many models.
  - Network management, trust and security obstacles to widespread adoption of home networking
  - Architectures relying on the physical location of components (e.g. gateway as an entry point)
  - Lack of content personalisation to the user or end device

Requirements for the future extended home

- Tools and services allowing users to flexibly and intuitively access, create, store, retrieve, process and share in a secure way their content
- Secure and self managed environment integrating as well networked intelligent devices (e.g. sensors) allowing novel application within the home beyond home automation (support to health, inclusion, anti-mobility…, e-government),
- federation of all the ***"home environments"*** in a virtual ***"extended home environment"***, which would "distribute" the resources of an "evolved" home network over several physically separated domains, enabling users to have similar application experiences as if they were accessing services in their primary homes.

An example: virtual communities at play in TA2 – Together Anywhere, Together Anytime

- **Vision**
  - New media experiences for households and families
- **Impact**
  - new patterns of consumption and production of digital media
  - new converged business opportunities
  - improved social and emotional well-being

- **Prototype applications**
  - Family game
  - My videos
  - Child's play
  - Sixth age
  - Improved social communication
- **Key technology capabilities**
- **System architectures**

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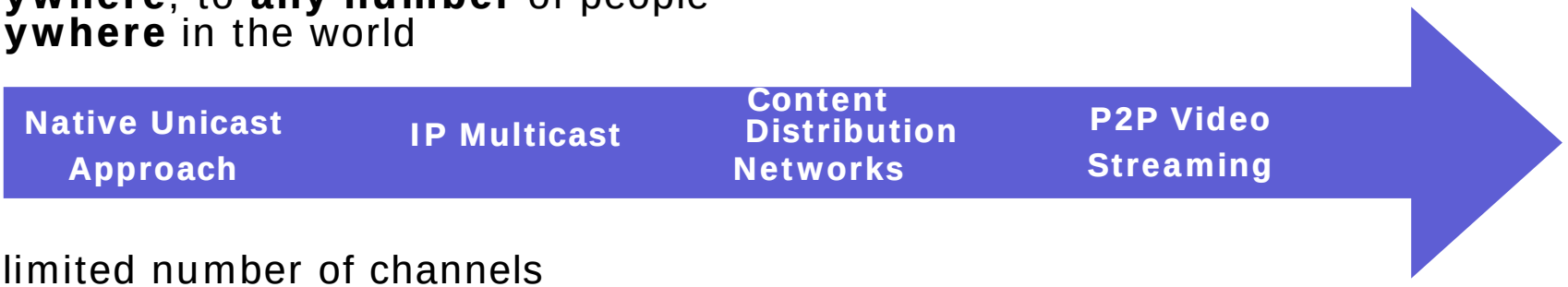
An example: Next Generation of P2P

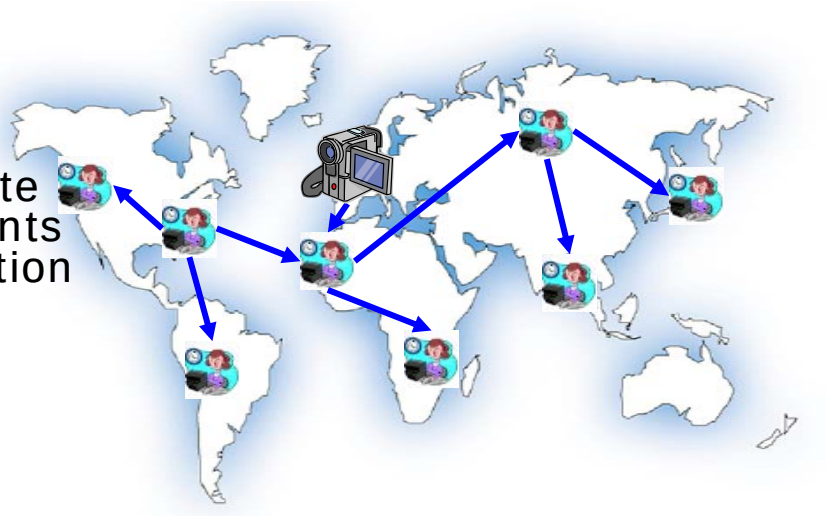
Video streaming over the Internet

- **Objective**: Enable video distribution from **anywhere**, to **any number** of people **anywhere** in the world



- Unlimited number of channels
  - Everyone can be a content producer/provider

- "classical" P2P → **P2P NEXT** "a cooperative paradigm"
  - the network and the application cooperate to meet the quality of service requirements and to reach the largest possible population
  - On-demand, personalised, social networking
  - Tested in a "living lab" scenario



Conclusions

- EU standardisation has proved to be an efficient tool, in support of competitiveness; but needs some evolution
- An integrated R&D, standards, deployment / regulation approach is still desirable for a number of technologies
- Future challenges: interoperability, convergence, shorter innovation cycles, globalisation, royalties and IPR issues
- ETPs working on a common Strategic Research Agenda is a major push to find a joint strategy to interoperability and standardisation
- Encouraging researchers to address interoperability and standards at the collaborative research stage (ex-ante)
- Experimentally-driven research can help discover unexpected technical, societal and economic implications of technologies, including possible evolution of standards

Thank you for your attention!!