image: flickr/lord cuauhtli

I T U and the digital age

Lara Srivastava

Senior Policy Analyst, Strategy and Policy Unit,
International Telecommunication Union

Visit of the HS Liechenstein, Geneva, 09/03/07

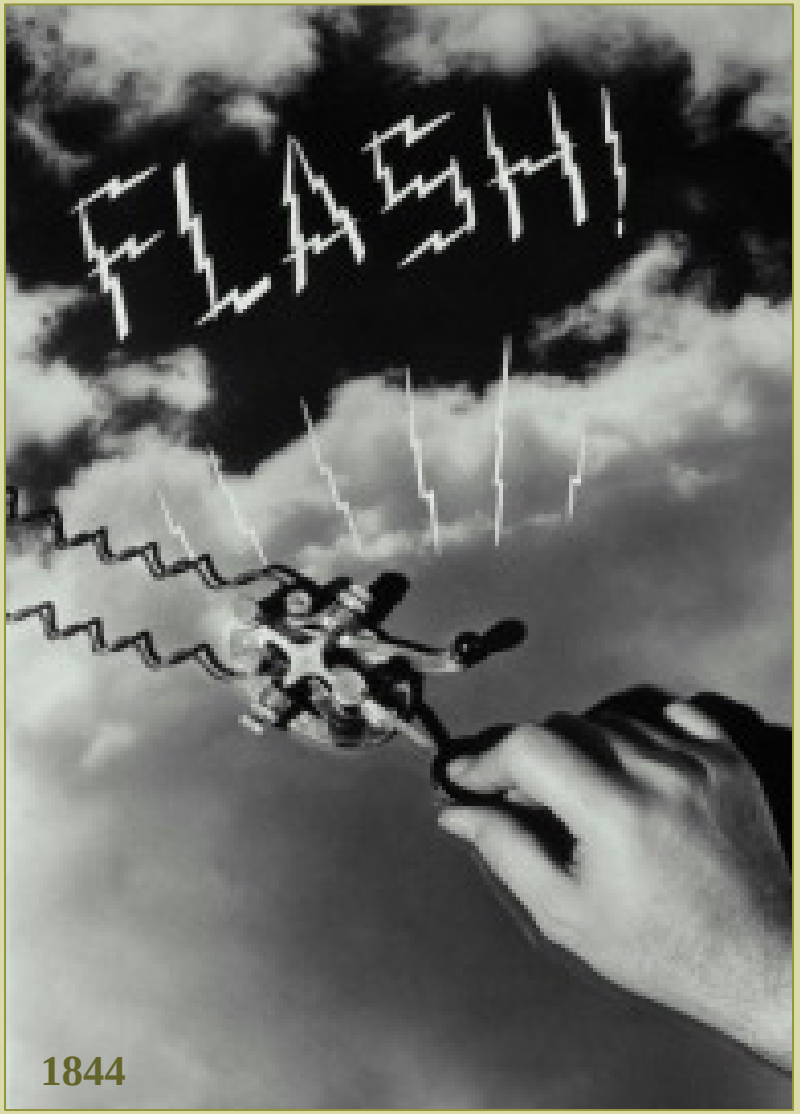
Helping the world communicate

International Telecommunication Union

Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership. Lara Srivastava can be contacted at lara.srivastava@itu.int

looking back

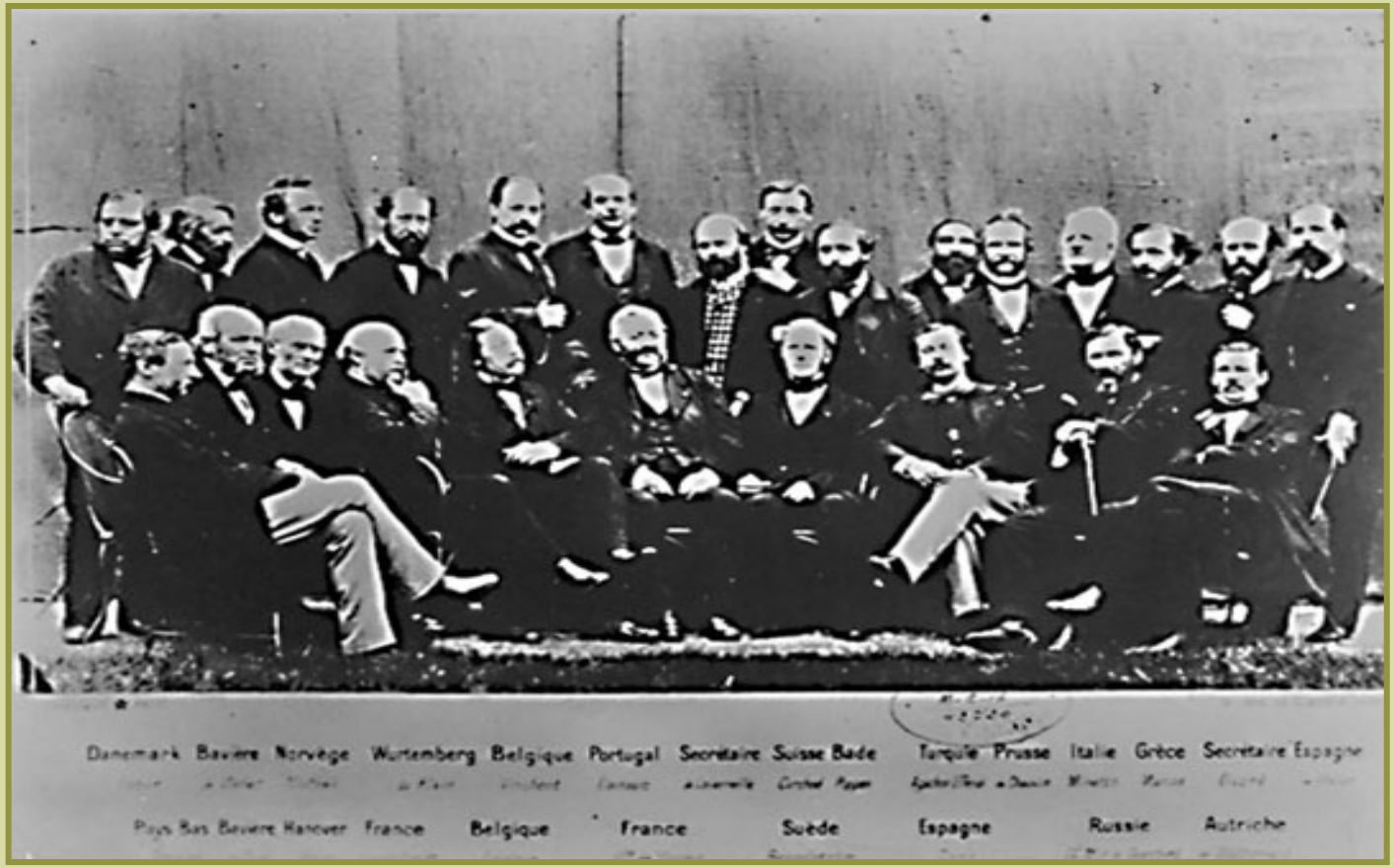
what hath God wrought



in 1864, radio is predicted (detected in 1887)

Hertz

the international ‘telegraph’ union



1865

an enduring institution

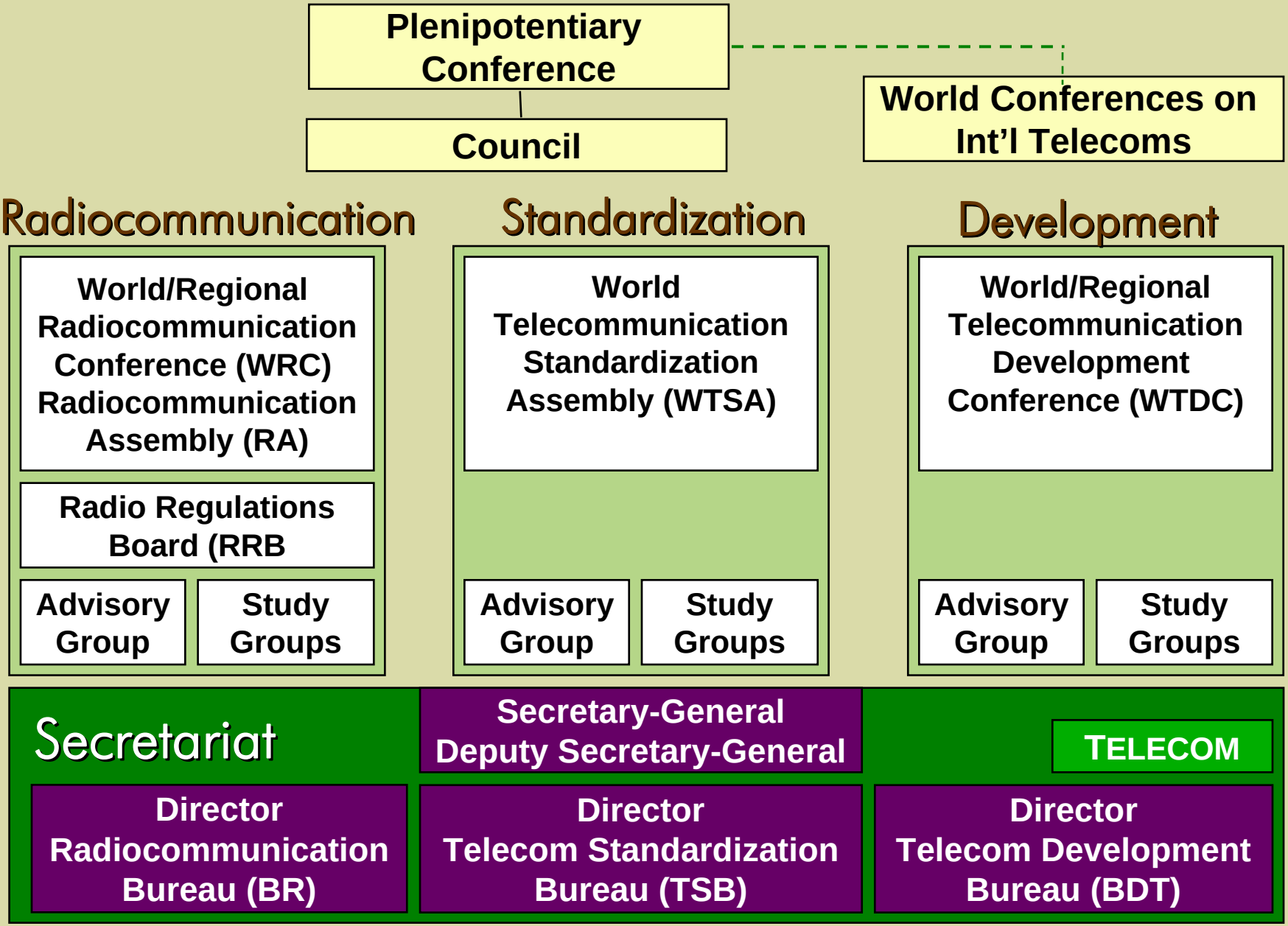
- ITU is the oldest international organization in the world…
  - … with its work spanning 3 centuries
- ITU pre-dates the United Nations, (became a specialized agency in 1947, changed name in 1934)
- ITU ranked among the "***World's Top 10 Most Enduring Institutions***", one that has:

> "changed and grown in unswerving pursuit of success and relevance - yet remained true through time to its founding principles"
>
> - Report by Booz Allen Hamilton and leading scholars

ITU in a nutshell

- UN specialized agency, concerned with the development of telecommunication networks and services worldwide
- 142 years old
- 191 Member States and 650+ Sector Members
- Around 790 staff / 83 nationalities
- 2006 budget = CHF164 m (USD 130 m)
- Secretary-General: Hamadoun Touré (Mali)
- Deputy Sec-General: Houlin Zhao (China)
- **Website: http://www.itu.int**

how the ITU is structured



according to the International telecommunication constitution (antalya, 2006), the role of ITU is:

- international cooperation in telecommunications
- technical assistance to LDCs
- to promote technical development
- to extend the benefits of telecoms
- to promote telecoms for peaceful use
- to harmonize national policies
- to promote telecoms in cooperation with other national and regional bodies

but what does this all mean? what does the ITU actually do?

- Spectrum allocation and registration
- Coordination of national spectrum planning
- International telecoms standardization
- Collaboration in international tariff-setting
- Cooperation in telecoms development assistance
- Measures for ensuring safety of life
- Extension of universal access
- Policy reviews, information exchange

international treaties

- **constitution and convention of ITU**
  - two complementary treaties, containing mainly housekeeping details but also some longstanding international commitments (e.g. common carrier tradition)
  - major update in 1992; minor updates:1998, 2002, 2006
- **international telecommunication regulations**
  - thin (10 Articles) treaty concerning mainly accounting practices. Last update 1988 – next review 2012
- **radio regulations**
  - thick (>1’000 pages) treaty governing use of radio spectrum. Updated every WRC (next in autumn 2007)

the work of the various arms of ITU

Standardization (TSB)

- world telecom standardization assembly (Brazil, October 2004)
- ITU-T recommendations
- stewardship of international numbering plan
- country codes
- universal international freephone
- ENUM
- collaboration with the internet community (e.g. IETF, ICANN, IGF)
- director: Malcolm Johnson (United Kingdom)

Radiocommunication (BR)

- world radio conference (Geneva, Oct-Nov 2007)
- ITU-R recommendations
- stewardship of radio frequency & satellite orbits
- radio Regulations
- master international frequency register
- safety of life services (maritime, aeronautical, etc.)
- director: V. Timofeev (Russia)

Development (BDT)

- world telecom development conference (Doha, March 2006)
- study groups
- telecommunication Indicators reports and databases
- regulatory assistance
- technical cooperation
- regional offices (11)
- director: S.Al Basheer (Saudi Arabia)

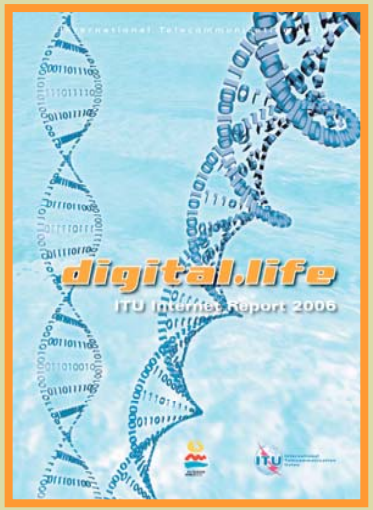
Secretariat

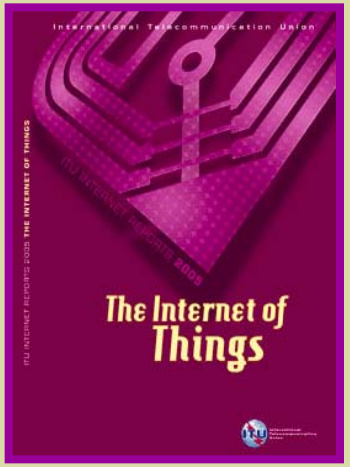
- plenipotentiary conferences (Antalya, November 2006)
- hosting secretariat for World Summit on the Information Society (WSIS) - Geneva phase, (December 2003) and Tunis phase (November 2005)
- ITU council
- ITU news: www.itu.int/itunews/
- support services (e.g. IS, languages)
- ITU TELECOM (WORLD 2006 in Hong Kong in December)
- policy, research and analysis (SPU)

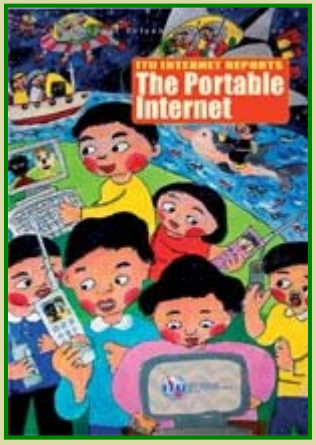
SPU Publications: ITU Internet Reports

…a series of reports tracking the development & policy implications of the internet, with latest data

- **2006: digital.life**
- **2005: The Internet of Things**
- **2004: The Portable Internet**
- 2003: Birth of Broadband
- 2002: Internet for a Mobile Generation
- 2001: IP Telephony
- 1999: Internet for Development
- 1997: Challenges to the Network







ITU New Initiatives Programme - Technology Foresight

www.itu.int/ni

- a comprehensive research programme
- country case studies, thematic studies
- expert brainstorming and symposia

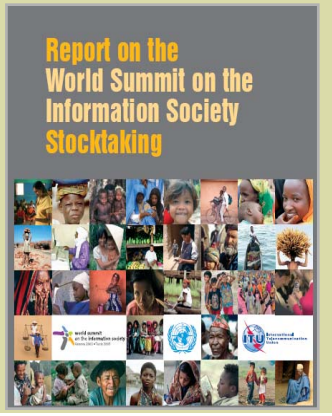
ITU New Initiatives

recent topics & publications

- The Future of Voice (January 2007)
- The Regulatory Environment for Future Mobile Multimedia Services (June 2006)
- What rules for IP-enabled NGNs? (March 2006)
- Ubiquitous Network Societies (April 2005)
- Shaping the Future Mobile Information Society (March 2004)
- Radio-spectrum Management for a Converging World (Feb 2004)
- Internet Governance (Feb 2004)

other ITU research publications

- World Information Society Report
  - inaugural edition, July 2005
- World Telecom Development Report
  - a series of reports on broad themes (e.g measuring access, restructuring, mobile)
  - includes world telecom indicators
- Trends in Telecom Reform
  - Reports focusing on regulatory issues (e.g., VOIP, effective regulation, spam)
  - Annual regulatory questionnaire
- WSIS stocktaking database
  - See www.itu.int/stocktaking



we have come a long day since the ITU was first created.

…e.g. was this the first mobile phone?

1910: Lars Magnus Ericsson and his wife Hilda

from science fiction to science fact

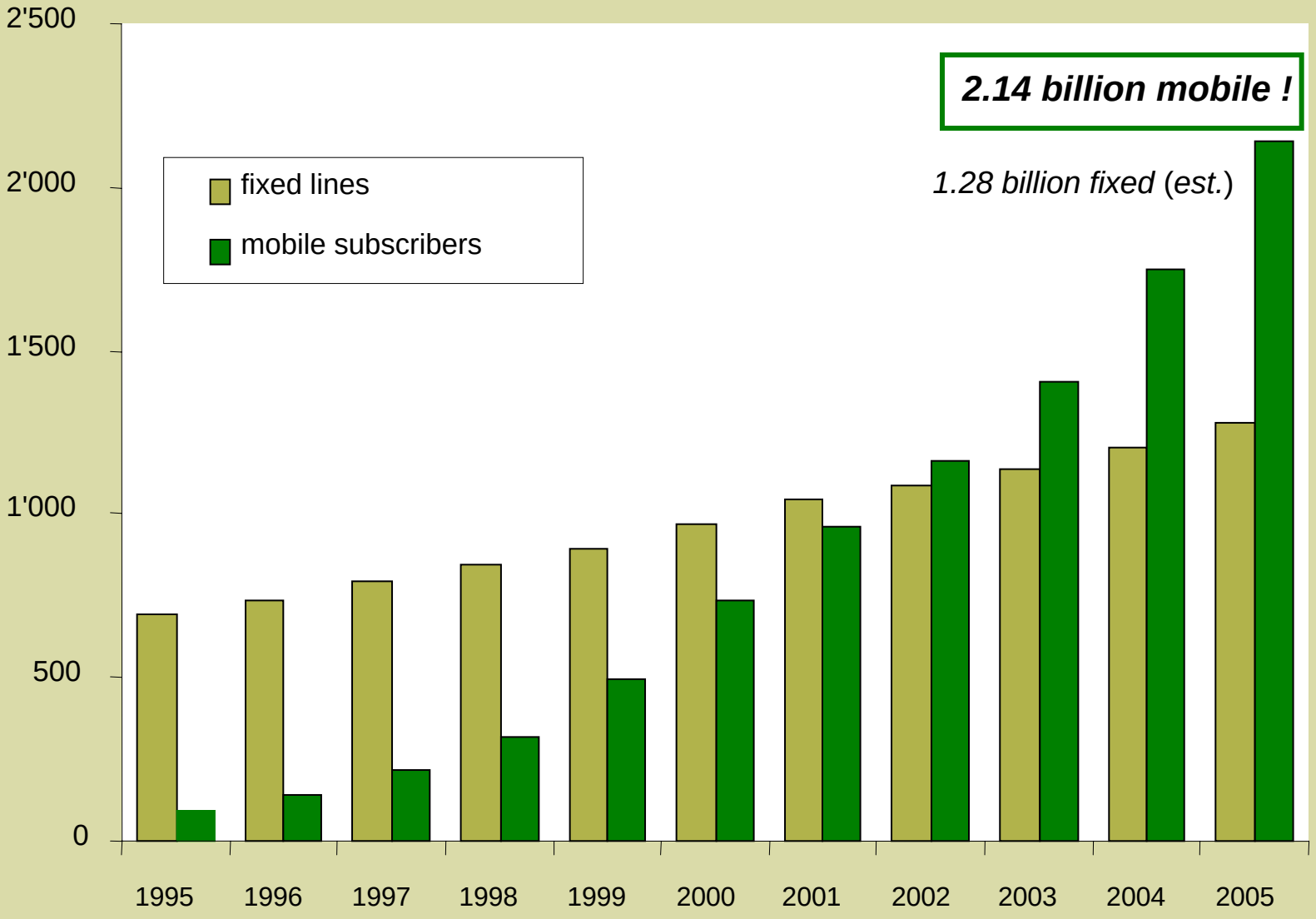
today's digital age: science fiction to Lars M. Ericsson and his wife?

- the birth of a global Web of information, a revolution in itself (over 1 billion 'users')
- popularity around the world of small mobile devices as gateways to the world
- growth of high-speed infrastructure
- an emphasis on "always-on" communications and information access
- multimedia anytime anywhere
- users as creators of content, of networks
- advances in computing rendering information even more "ubiquitous"

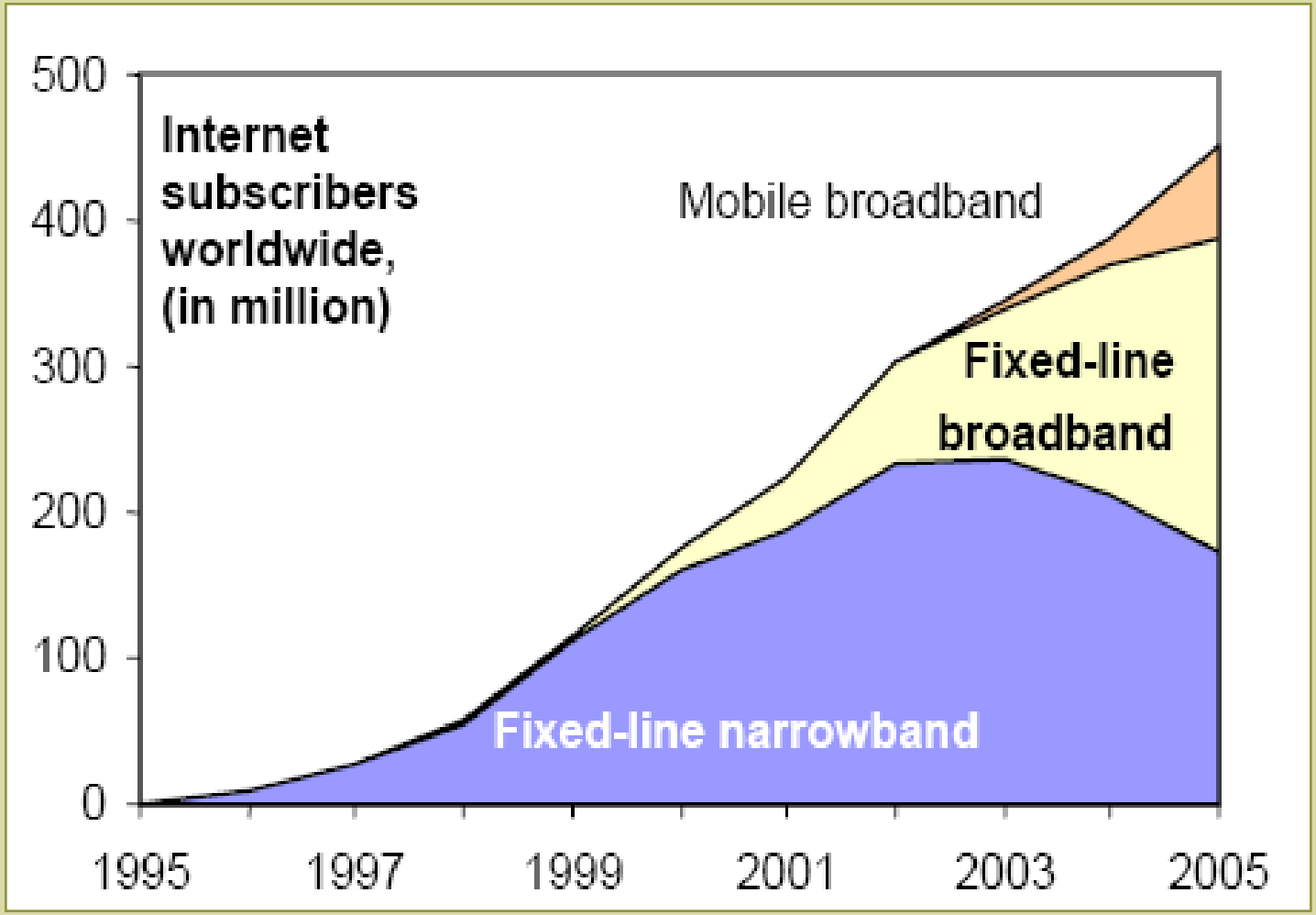
from fiction to fact: a challenging transition

- from steady, slow-moving markets to rapid innovation
- from low-speed to high-speed
- from local to global
- from sporadic information to perpetual information
- from fixed to mobile
- from user to producer
- from stability to uncertainty

we are definitely more mobile



…and getting faster all the time



Source: ITU Internet Reports 2006: digital.life

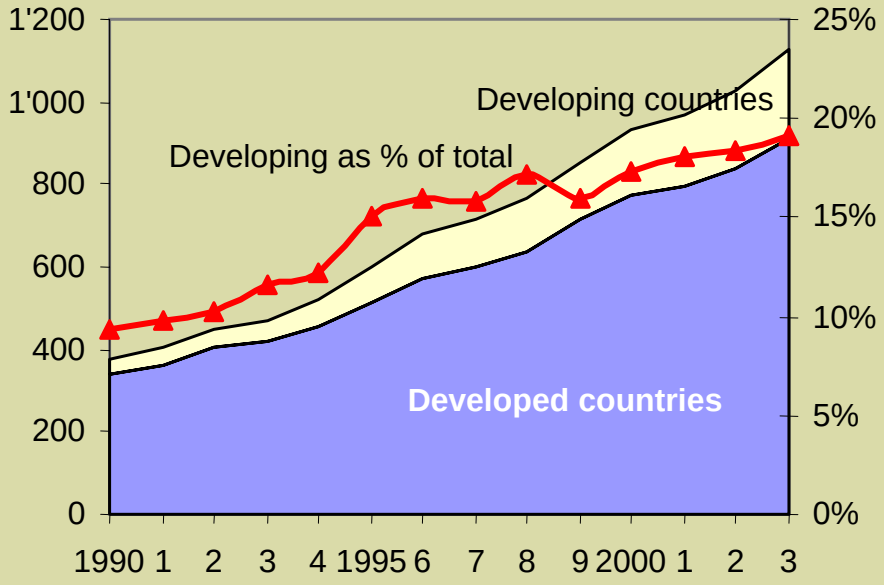
network access is expected of us…

…as technology becomes part of daily life

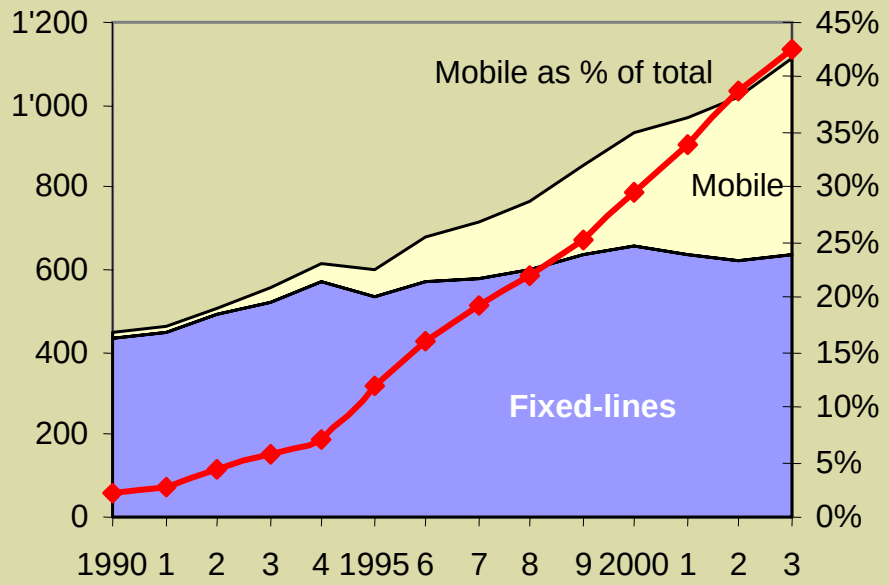
- **mobility** of technology, "on-the-go" access
- **"lifestyle", "personalization"**, "**customization**" of devices, networks, content
- inability to be without technology for long (**information withdrawal**?)
- human relationships begin to be **mediated by technology**

some markets are getting saturated, others are just burgeoning ….

Telecom services revenue, in US$ bn



Fixed-line and mobile services revenue, in US$ bn



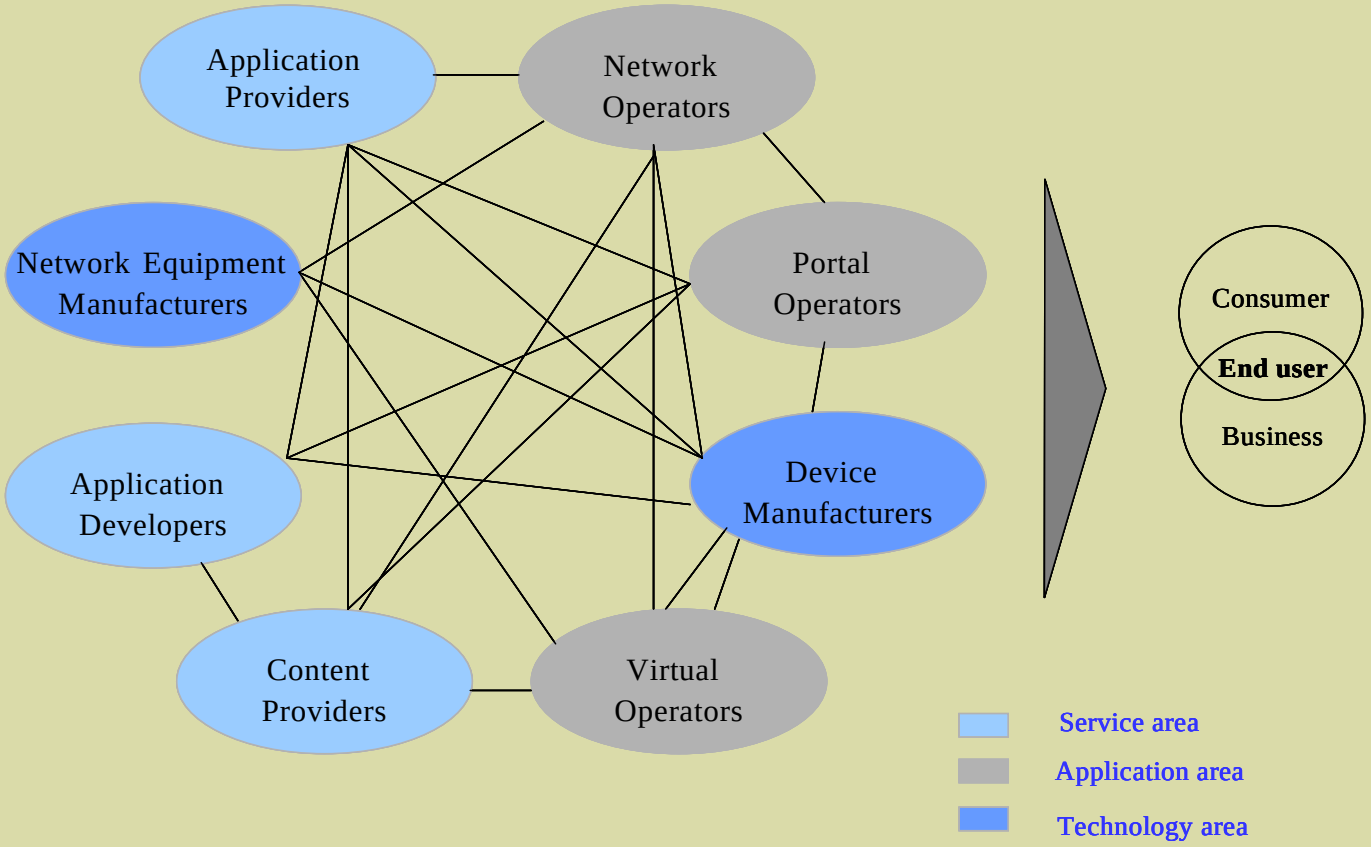
Developing countries growing faster that developed ones

Mobile markets growing faster than fixed-line markets

Source: ITU Internet Reports 2005: The Internet of Things

and we have a rapidly – changing market landscape

New players – new roles
Old players – new roles



Source: EITO

a few words about mobile

mobile has made it impact not only in quantity but also in quality

- a portable daily necessity not unlike e.g. a pen or a piece of ID?
- typically no more than one metre away from users (day & night) – it's used even when fixed line available
- replaces wristwatch & alarm
- loss causes panic and major disruption
- reflects individual identity (as an extension of the self)

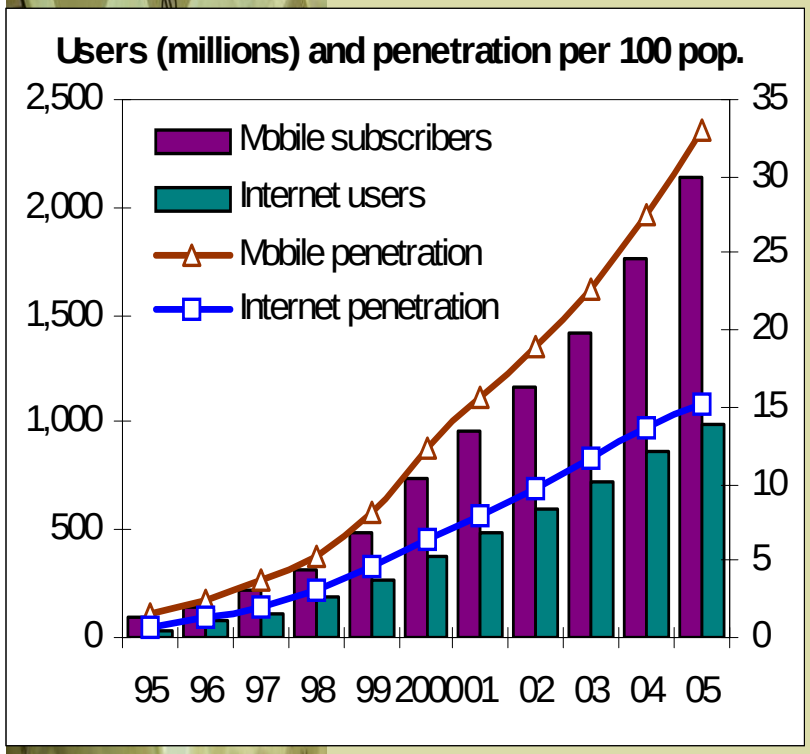
- a wide appeal and can facilitate shared experiences (e.g. moblogging, P2P exchange)
- most intimate ICT device around, creating "emotional attachment" in users

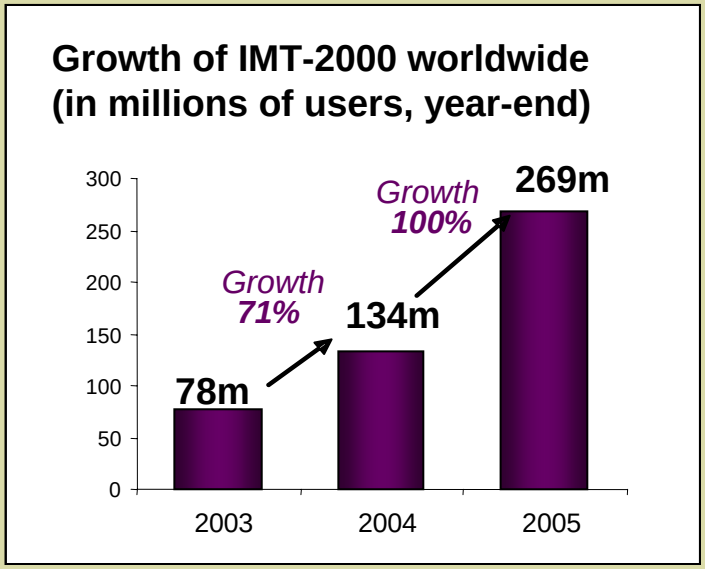
mobiles: a boon to access

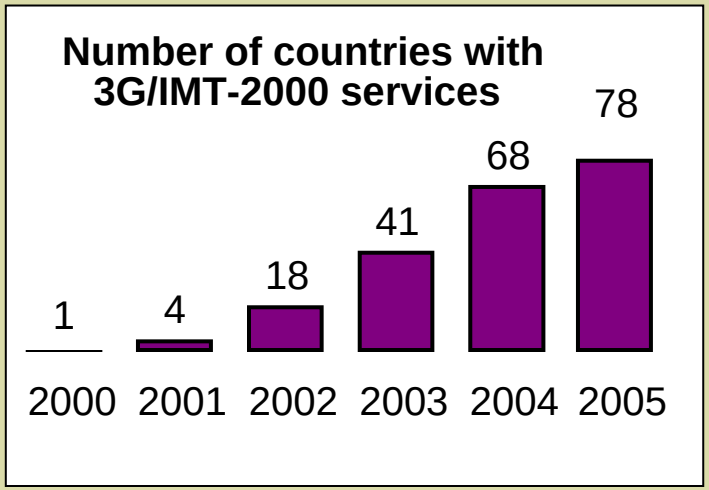
- developing countries have seen the greatest impact of mobile communications on access
- cellular networks can be built faster than fixed-lines networks & and can cover geographically challenging areas

- mobile services have served to boost competition, and prepaid models have opened access for those who would otherwise not qualify for subscription plans

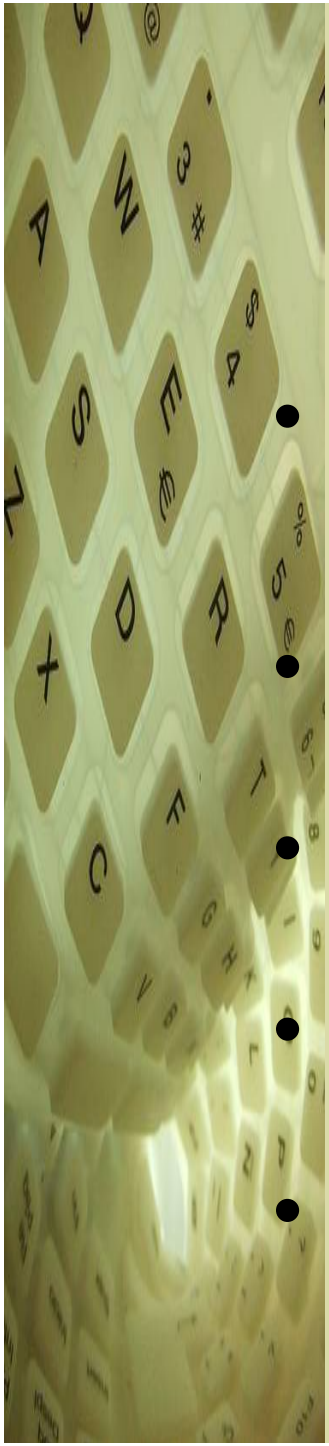
mobile multimedia





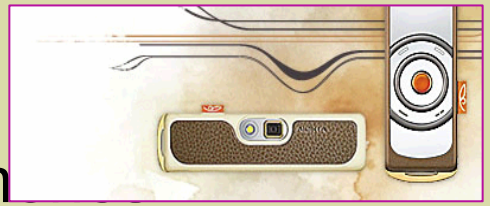


Source: ITU



manufacturers continue to aim for more personalization …

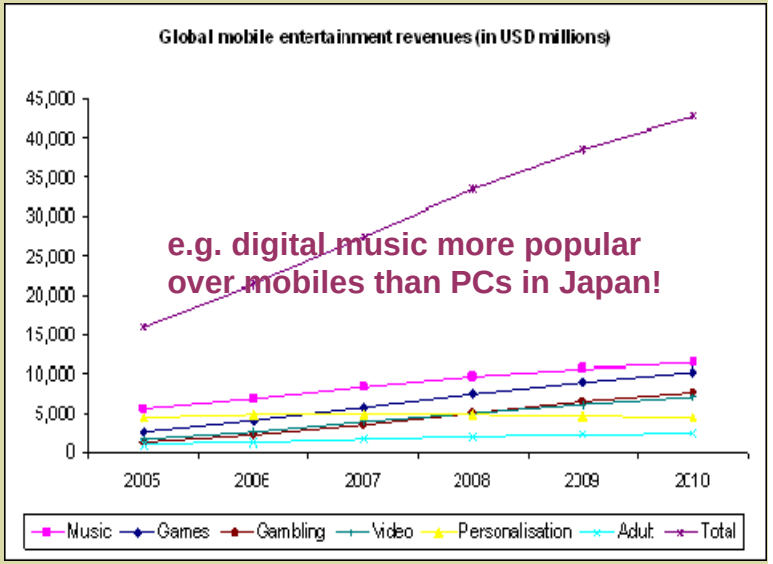
- fashion phones: e.g. chocolate-like phones such as Nokia's 7380, LG's slim KG800 & Motorola RAZR, athletes' sport smartphones
- security phones: e.g. fingerprints, or Pantech's finger-writing PG-2800
- mood phones: e.g. Orneta biorhythm for windows-based smartph
- smelly phones e.g. Samsung's patent application for perfume-spraying mobile phone functionality
- slow phones e.g. NTT DoCoMo's handset which slows down talking speeds



Source: Nokia

…while operators scramble to push multimedia services

- large proportion of content still stems from personalization services (e.g. ringtones, wallpapers)
  - driven by events or brands unrelated to the mobile industry, e.g popular TV series. Will this change in the future?
- analysts predict that content will diversify over the next years, first to more audio & video services (e.g. mobile TV, with share of personalization services decreasing
- Total mobile entertainment revenues set to rise from 15.8 to 42.8 bn USD by 2010

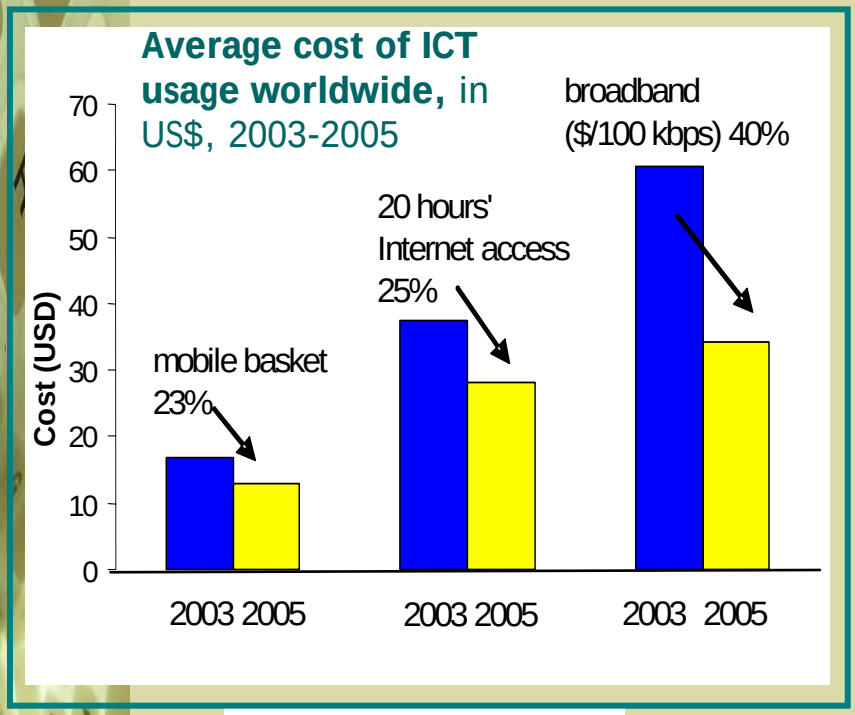


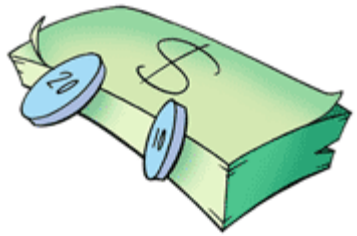
Source: Informa

- (how) will traditional mobile players re-position themselves?

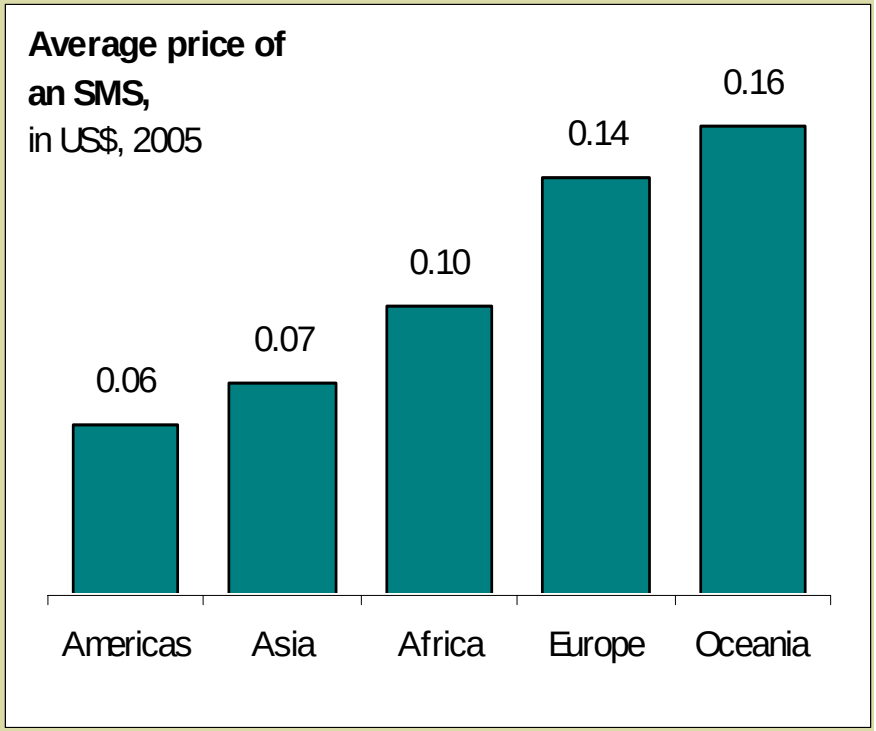
affordability a key problem

price of mobile services hasn't decreased at same rate as broadband, internet

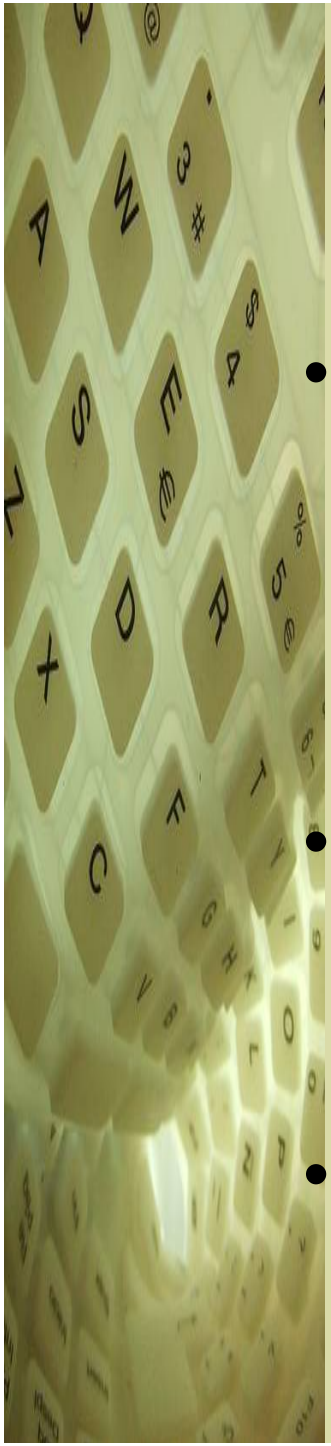




cheap-to-produce services, e.g. SMS, priced well-above cost in some regions

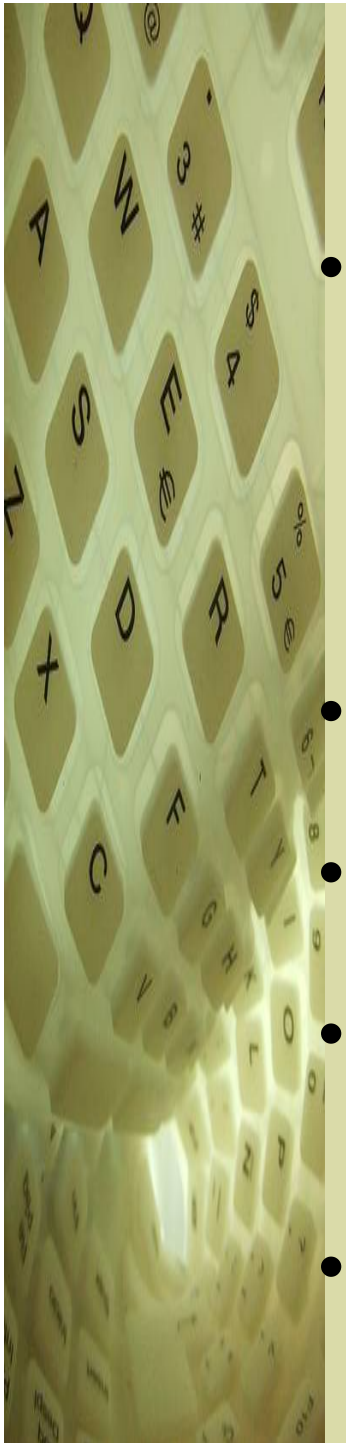


Source: ITU World Information Society Report



fostering a competitive environment

- ICT regulatory trends in Europe:
  - from *ex ante* to *ex post*
  - roll back of sector-specific regulation as markets become more competitive in favour of competition law
- mobile has traditionally been less regulated than fixed
  - many of the larger mobile markets remain relatively concentrated in Europe
- In the broadband world, concerns over access to incumbent's networks persist in many areas



SMS SOS!

- by some estimates, the total SMS revenues in 2005 were about 75 billion USD. Compare this to:
  - Global box office: 25-30 billion
  - Global music industry revenues: 35 billion
  - Videogaming, consoles & all software: 40 billio

- though SMS interconnection costs are very low, retail costs remain high
- this does not bode well for future mobile data and multimedia pricing
- though little has been done thus far, some regulators are imposing price caps on SMS termination (e.g. ARCEP).
- but some argue that intervention at retail level (rather than wholesale) may be required

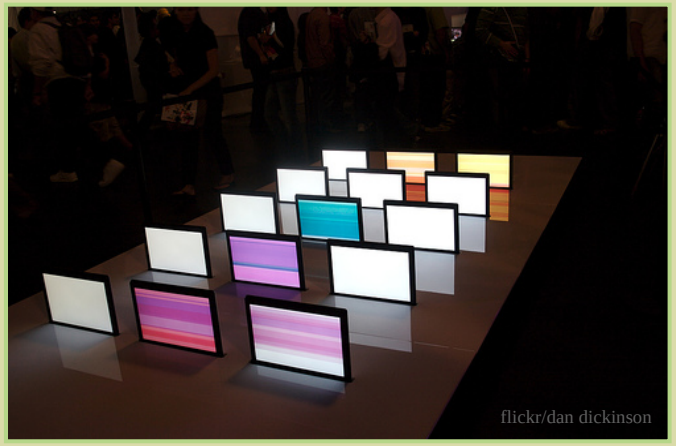
and what about content

- specific forms of content
- advertising
- copyright and DRM
- user-generated content

the future is ubiquitous?

increasingly pervasive wireless communication environment

- growth of high-speed and high-mobility networks
  - 802.16, 802.20 etc…
- importance of new short-range wireless techs & applications
- from connecting people and PCs (devices) to connecting “things”



connecting things- a new dimension

Any TIME connection

- On the move
- Outdoors and indoors
- Night
- Daytime

Any PLACE connection

- On the move
- Outdoors
- Indoors (away from the PC)
- At the PC

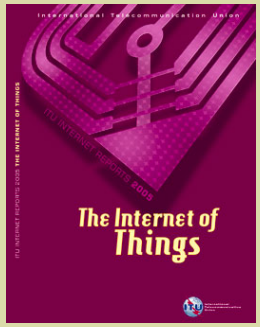
Any THING connection

- Between PCs
- Human to Human (H2H), not using a PC
- Human to Thing (**H2T**), using generic equipment
- Thing to Thing (**T2T**)

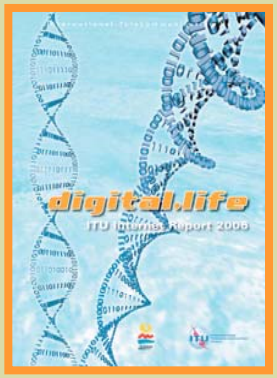
Source: Adapted from NRI (Japan)

the next internet: an Internet of things?

- Technologies like RFID have the potential to tag every item on the planet
- Combined w/ sensors, they can create context-aware applications, linking the real world to the virtual world
- Developments in “smart materials” and nanotech will further drive this revolution



www.itu.int/internetofthings



www.itu.int/digitalife

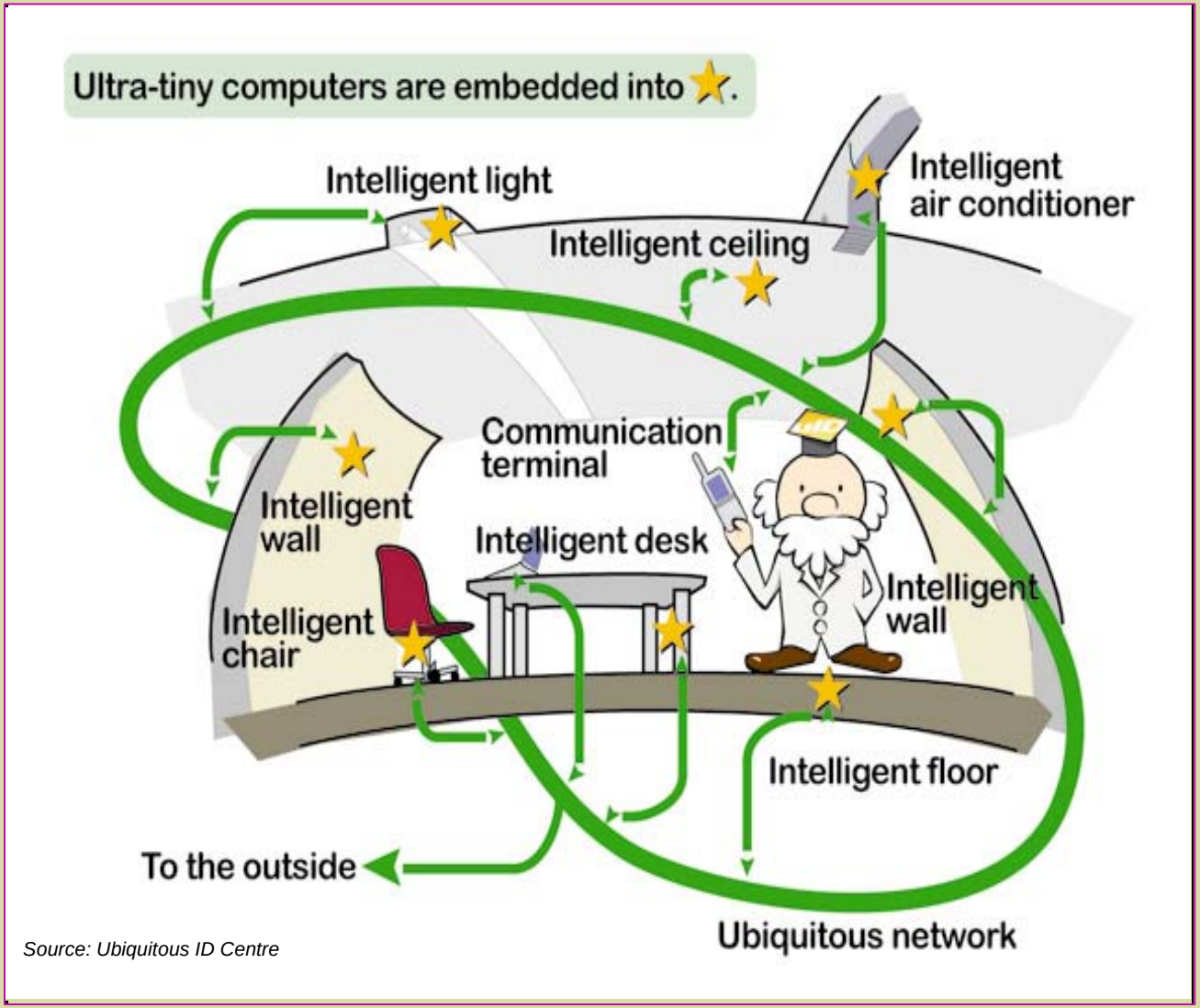
- **ITU Internet Report 2005: The Internet of Things**
- **ITU Internet Report 2006: digital.life**

4 key technological enablers

- *T**agging* Things: RFID
  - enables real-time identification & tracking
- *S**ensing* Things: Sensor technologies
  - enables detection of environmental status and sensory information
- *T**hinking* Things: Smart technologies
  - build intelligence into the edges of the network
- *S**hrinking* Things: Nanotechnology
  - makes possible the “networking” of smaller and smaller objects

from mobility to ubiquity

From smart mobiles to ambient networking



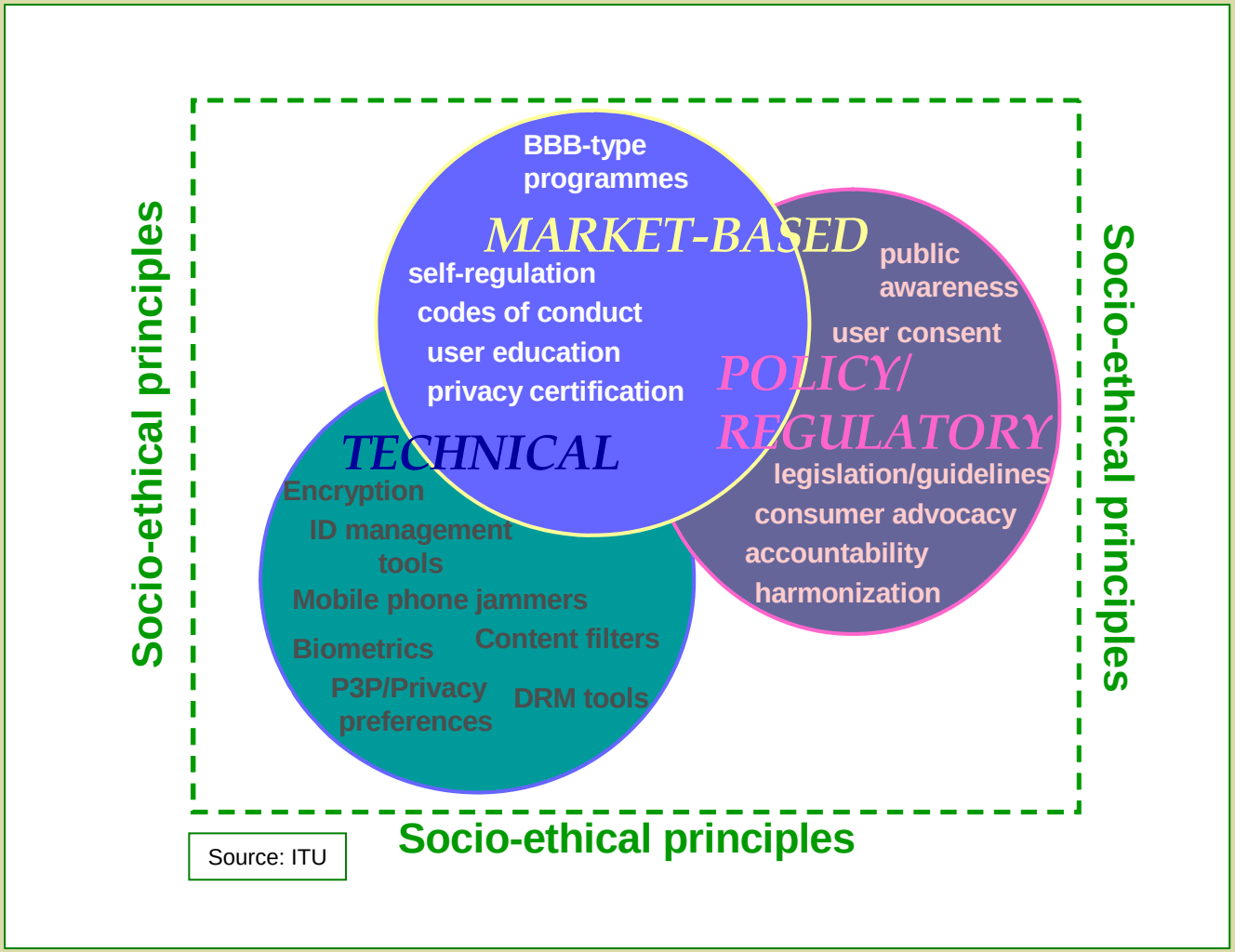
Source: Ubiquitous ID Centre

important challenges

- standards-setting and interoperability
  - Harmonization required particularly in the area of transmission protocols
  - Tag formats have *de facto* standard “EPC”
- governance of resources
  - Who controls the unique identifiers?
  - More commercial value at stake than DNS
- data protection and consumer privacy
  - Information contained on tags should appropriately managed and controlled

being future-proof means a holistic approach

Example: Privacy and data protection



Source: ITU

… and global dialogue

NASA

- development of harmonized approaches, e.g.:
  - spectrum management
  - licensing
  - global standards
- information exchange, e.g. on regulatory best practices
- development and interoperability of privacy-enhancing technology and “privacy by design”
- data protection schemes across borders and articulation of global digital identity management principles
- increasing security in critical infrastructure
- international cooperation on digital rights mgmt

more information:

***ITU's Strategy and Policy Unit** (SPU)*

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THE ITU YOUNG MINDS PROGRAMME

How to apply for the 2007 ITU Young Minds competition

The Strategy and Policy Unit (SPU)'s **Young Minds in Telecoms** competition is open to graduate students and recent graduates in economics, political science, law, literature, telecommunications, computer science, information systems and related fields. The objective of the ITU Young Minds Programme is to give young people valuable exposure to the international telecommunication environment and to the work of the ITU.

Information on the winners and runner-ups for the 2005 and 2006 competitions are available on this website. One of the main criteria for evaluation was the submission of an essay and those essays that were highly-ranked in the evaluation process have been made available on this site.

The 2006 ITU Young Minds Winners

Chin Yung Lu (Hong Kong SAR, People's Republic of China)
Read Essay: Key opportunities and threats raised by the growing use of Services over IP such as VoIP and IP-TV

My name is Chin Yung Lu and I am a winner of the ITU Young Minds Competition 2006.

About Chin Yung's internship in the SPU
My main duty in the Strategy and Policy Unit

Lucy Yu (United Kingdom)
Read Essay: How can the interests of end users in the information society be balanced with the interests of business, in the UK?

I am Lucy Yu, one of the 2006 ITU 'Young Minds'.

About Lucy's internship in the SPU
Amongst other things, my work at ITU has

How to Apply

Internet

t h a n k s

lara.srivastava(a) itu.int

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Helping the world communicate

International Telecommunication Union

Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership. Lara Srivastava can be contacted at lara.srivastava@itu.int