



Market Challenges:  
competition, implementation costs, changing marketplaces, complex migration scenarios and regulatory uncertainties

## Convergence towards Ubiquitous Network Societies

SESSION 9: Market Opportunities and Challenges

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## Outlook



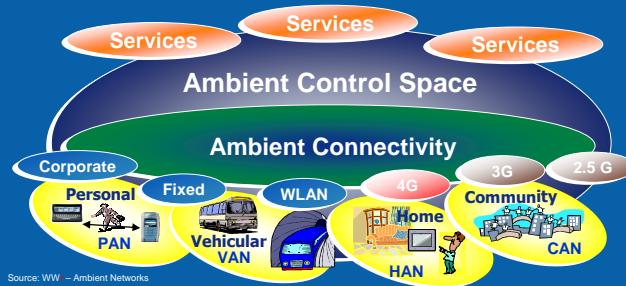
- Market drivers
- Operator challenges
- Spectrum and regulatory

## Market Drivers for Ubiquitous Networks



- Electronic customer support any time, everywhere
- Emerging bandwidth-intensive applications and services
- Continuing innovations and cost reductions of infrastructure and active equipment
- Increasingly extended capacity of traditional access networks
- Ability to use existing infrastructure to capture incremental revenues and an accelerated RoI

# Vision of Ubiquitous Networks



Source: WW - Ambient Networks

- Transient, spontaneous “composition” of networks
- Competitive & Cooperative networking (limited sharing of resources & functions)
- Scalability & Manageability of the concept (easy to use/deploy, many networks everywhere)
- Integration of legacy technologies & networks

# The subscriber wants ...



... it cheap, wants it now and wants to choose:

- to get one bill, one number
- to have one phone book
- to check one mailbox instead of many
- to communicate immediately in real-time
- to communicate cheaply
- to communicate with many people who are using different media at the same time

... his services anytime, anywhere, on his device:

Personalized and highly customized  
 More individual bandwidth  
 Always-on  
 Global roaming  
 Seamless network, GSM-EDGE-UMTS-beyond IMT-2000  
 Rich multimedia services: information, transaction, entertainment

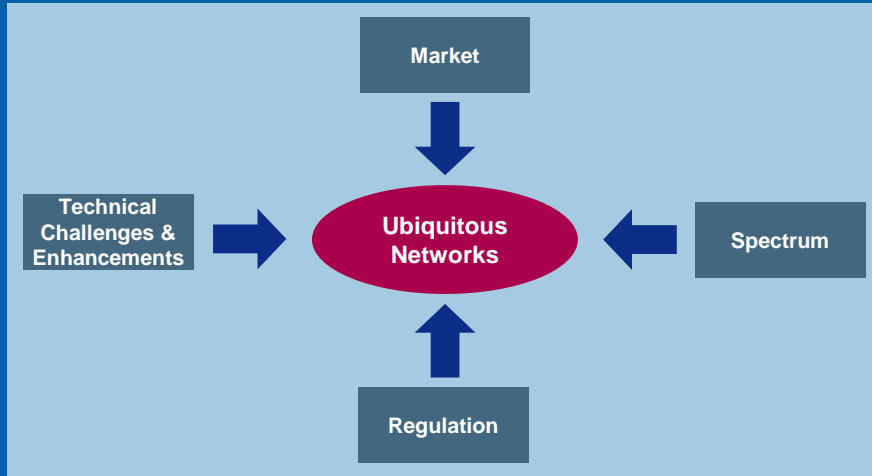
Loss of subscriber loyalty

Increase of subscriber knowledge

Increase of subscriber sovereignty

## Ubiquitous Networks

are subject to a number of opposing forces



## Changing lifestyles and end-user habits

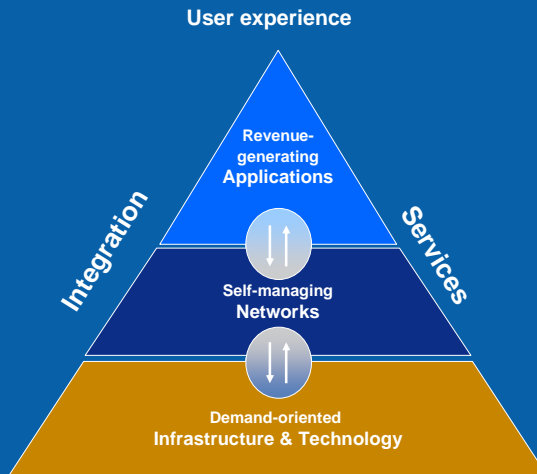


New mobile services will have a strong impact on everyday life of end-users

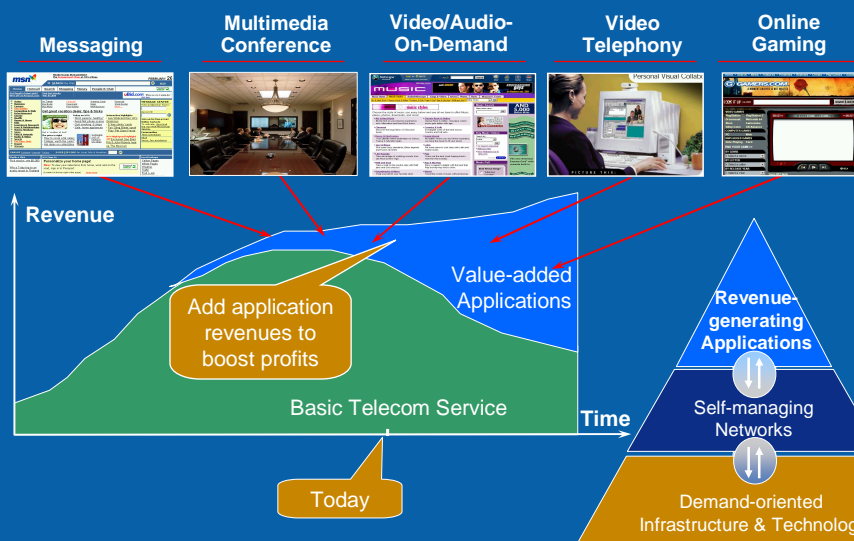
# Operators' needs: Deploying Profitable Multimedia Networks



- New revenues
- Optimized utilization of networks
- Harmonized & standardized infrastructure



# Operators' Challenges: Shift of Revenues' Sources



## Operators' Challenges: More Bandwidth = Increased Revenue ?

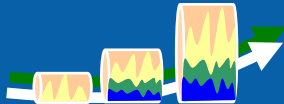


### Bandwidth capacity is multiplying

- Deployment of xDSL, WiMAX, WLANs

### Bandwidth demand is growing even faster

- Gaming and Video Services are bandwidth intensive



### Bandwidth & Demand are both exploding

- Near real-time & real-time traffic puts more stress on the BW
- The nature of traffic is changing to more dynamic with QoS orientation

- Most European operators are loosing money on flat-rate concepts
- Peer 2 Peer is major driving force
- Each household has a limited amount of money to spend
- Adding further BW does not resolve the QoS problem, generally worsens it by attracting more QoS-sensitive applications eg. Broadcast Video
- Increased bandwidth is NOT increasing ARPU automatically!



## Operators' Challenges: Complexities



Set Top

DRM

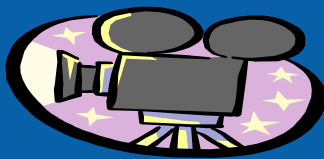
Encryption

Piracy in Territory

Network

Partners

Commercial Opportunity



Paradigm shift	Market unsure	PC or TV centric?
Open MPEG4 Issue	What is good video quality?	Individual "TV culture"
60+% Hollywood margins	Young market	Proprietary solutions
Fixed to mobile substitution	VoIP telephony	New players as ISPs & ASPs
Investment delays	Operator role?	Business model?

## Technical Challenges and Enhancements



### Challenges

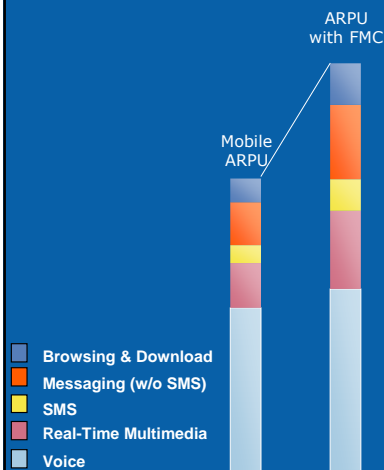
- Higher frequencies increase processing requirements
- Coexistence of different radios requires sufficient separation
- Underlay of ultra wide band (UWB) raises the noise floor for other users
- Higher data rates require wider bandwidth and new radio principles
- Seamlessness and ubiquitous use imply multimode & multiband devices

### Enhancements

- Microelectronics innovation (Moore's Law) delivers increased performance
- Improved filter technologies
- Radio technology improvements
- Higher order modulation schemes and smart / MIMO antenna systems
- Software configurable radio

Innovation is able to compensate many challenges but complexity and cost increase in the process

## Upside Potential through Fixed-Mobile Convergence



- Increasing ARPU by
- Attractive service packages
    - Convenience
    - Common look & feel
    - Transparent pricing by unified charging
  - Faster uptake of new services
    - Increasing critical mass of users
    - Especially for person-to-person services
    - Like Peer-to-peer Real time Multimedia
  - Stimulation of additional voice calls
    - Induced by increased usage of data services

All kind of services are suitable to be offered simultaneously in fixed & mobile

## Different Categories of Convergence



### Service Convergence

- same service offering for fixed and mobile user access (e.g., SMS / MMS, multimedia conferencing, gaming)
- universal numbering
- one bill



### Product Convergence

- common application server
- common service enabling solution (incl. charging)
- common session control
- common interworking functions

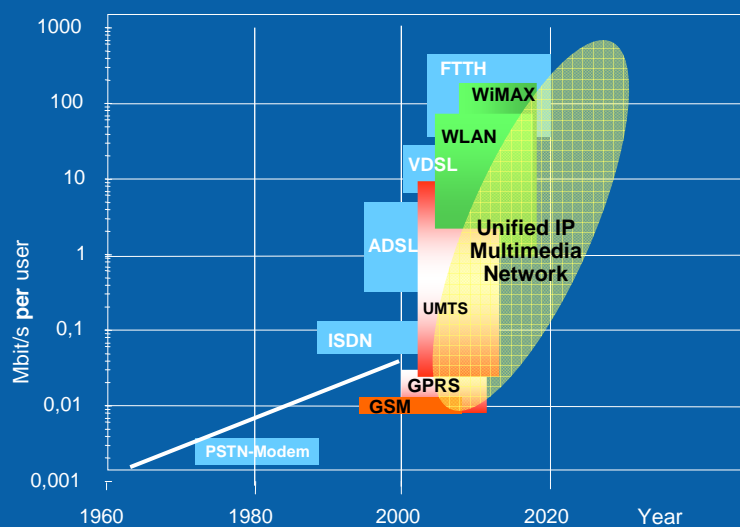


### Network Convergence

- common core network (control, user and transport plane)
- common operation
- support of any access network



## Data Rates and Access Technologies





## All-IP: ...hype or necessity?



Hybrid networks rule today in for long time

- **High OPEX**
- **Service convergence slow**
- **Service evolution slowed-down by the hybrid infrastructure (physical, logical and operational)**
- **Slow terminal equipment price erosion in hybrid environment**

It is a must, to come to a common denominator:

- **IP infrastructure**
- **IP control**
- **IP based terminals**
- **IP based services**

**All-IP is necessity to decrease overall communication costs**

## Radio spectrum is a precious asset



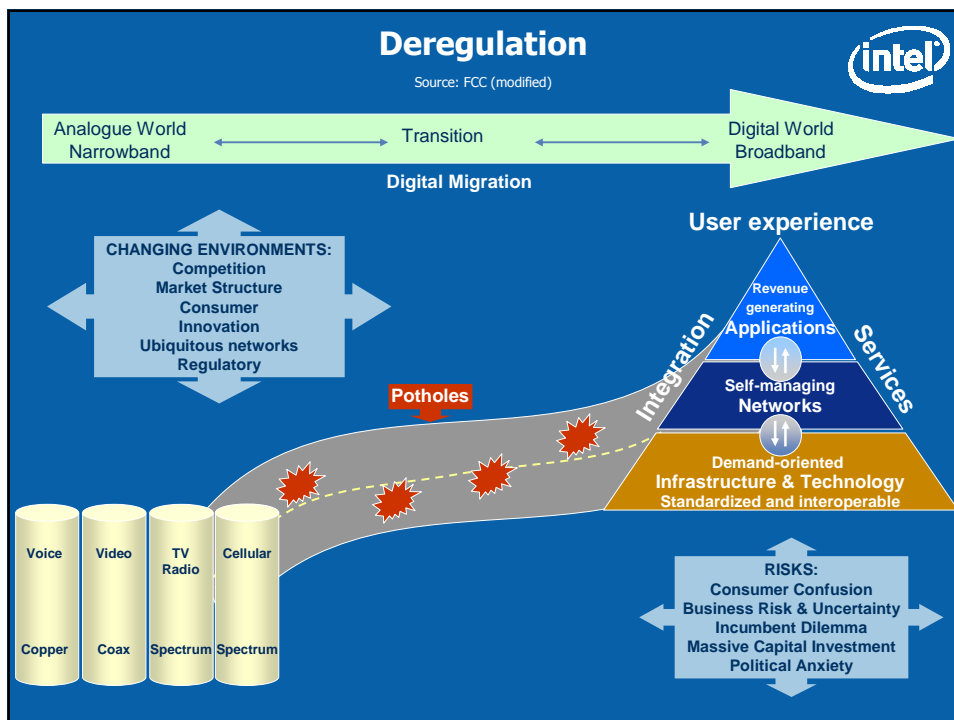
- Spectrum is the raw material for mobile business - it is of strategic importance for the entire industry
- The largest economic value per radio spectrum unit is generated by the mobile network user
- Many new players want a piece of this billion dollar pie
- We cannot generate new spectrum, only optimize its use
- Spectrum is licensed nationally, but is a global issue - radio waves do not recognize geopolitical boundaries
- Spectrum regulatory rules are in change process to adopt to rapidly increasing wireless broadband requirements

## The regulatory framework is under discussion

to increase efficiencies and take advantage of innovations



- Success of GSM is built upon concerted industry approach
- Today's regulators accept technology choices made by operators
- Technology Neutrality ensures the implementation of best solutions
- New applications and usage scenarios blur the boundaries
- Suitable & harmonized spectrum is hard to find, therefore very valuable and in high demand
- Spectrum Trading provides new options for underutilized frequencies





## Summary / Conclusion

- **Telecommunication market is here to stay as growth engine of global economy**
- **Generating new revenues is still the major challenge**
- **Customers like the variety of services, but not the burden of technology details**
- **Newest technologies and applications provides the optimal response to the end-users needs**
- **Migrating towards customer centric networks: continuous process, solid performance and reliability**



# Thank You!

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