Mobile Next Generation Service Offering and Concepts

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www.umts-forum.org

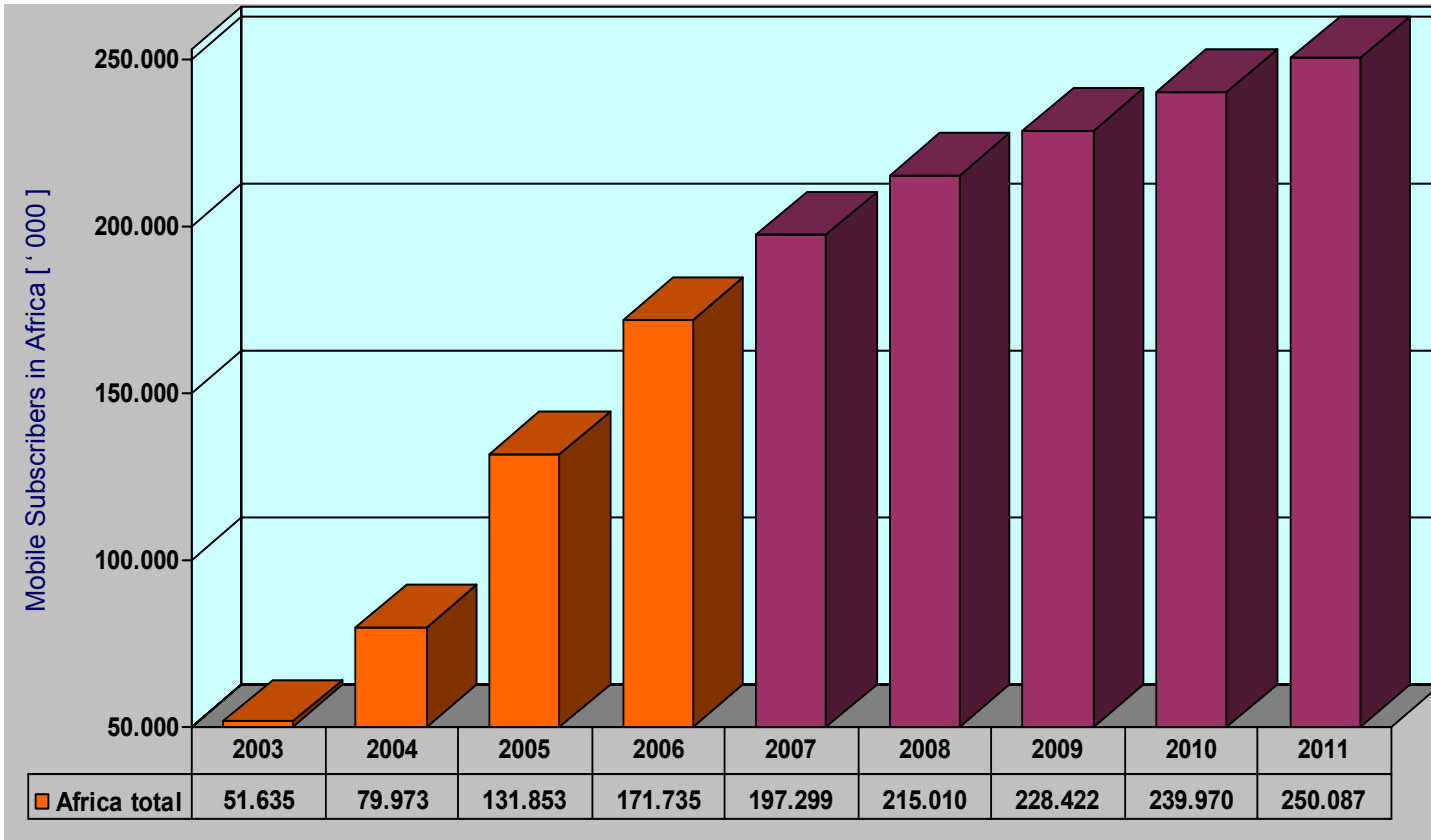Promoting the global success of third generation mobile

Overview

- **Expectations of a converged environment**
- **Dealing with the challenges of the paradigm shift**
- **Building on the early adoption of SIP/IP/IMS**
- **Delivery Platforms**
- **Summary**

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150 Million mobile subscribers

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2005 was a significant year for the mobile industry in Africa, as the market passed the all important '100 million subscribers' milestone (the 150 million subscribers milestone was exceeded 04 '06)

Forty-three out of Africa's 53 countries have more mobile than fixed line subscribers

The cost of a contract or airtime for pre-paid subscribers is still too high for millions of Africans who can barely afford to feed their families

Pre-paid users account for 95% of the mobile subscriber base (compared to 90% by E 3Q04) since bank accounts are a rarity outside more developed markets.

Whilst Asia will see the greatest number of net additions over the next 6 years, Africa will emerge as the fastest growing mobile market in the world

Mobile Subscribers in Africa [' 000]

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Africa total	51.635	79.973	131.853	171.735	197.299	215.010	228.422	239.970	250.087

We expect a total of 250m mobile subscribers until 2011
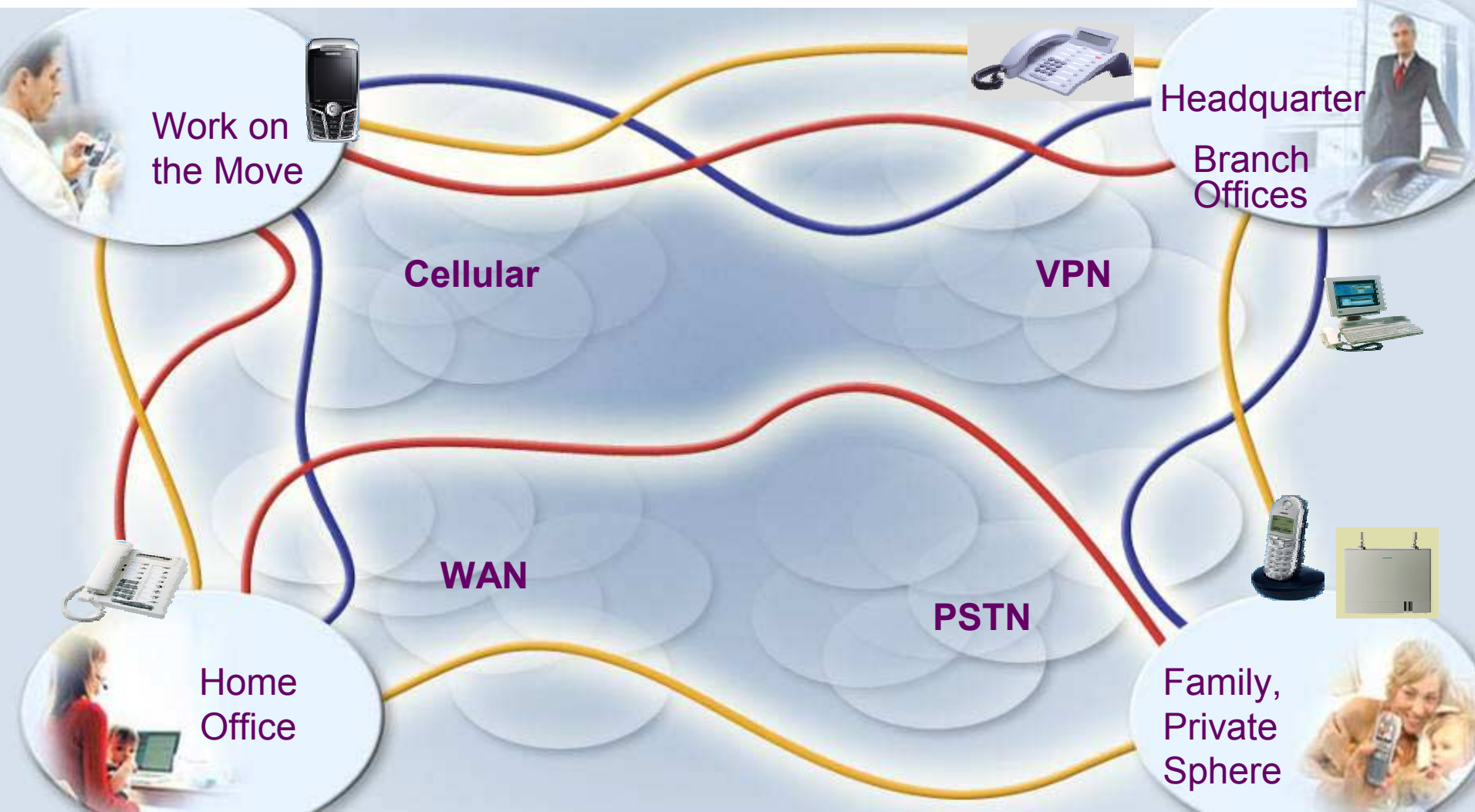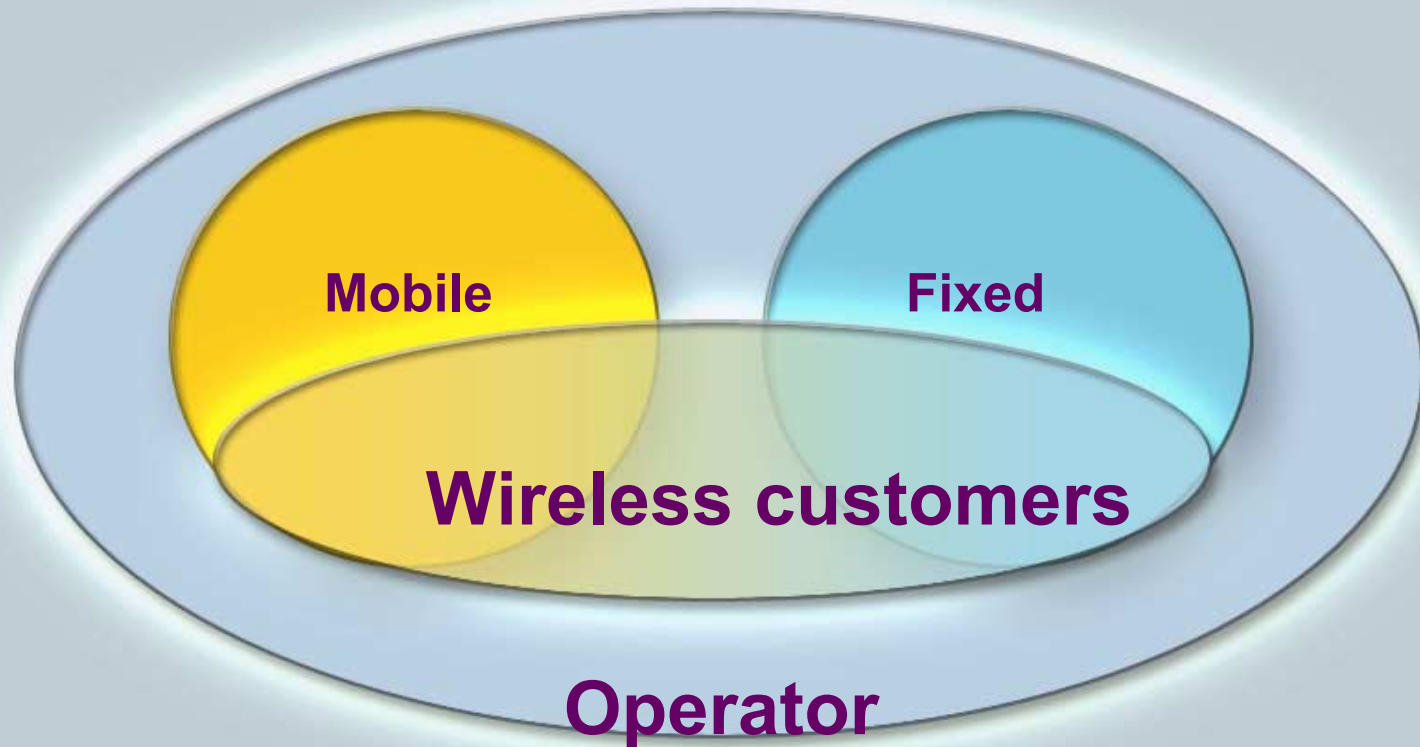### With a current pop of ~900m and a subscriber base of ~132m there's room for expansion

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ITU/BDT Regional Seminar on Broadband Wireless Access Africa

20th September, 2006, Yaoundé, Cameroon

▶ 3

The rise of the Information Society

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Problem: Fragmented Communications

Work on the Move

Headquarter

Branch Offices

Cellular

VPN

WAN

PSTN

Home Office

Family, Private Sphere

Next Generation Networks to provide solutions to remove barriers

Mobile

Fixed

Wireless customers

Operator

. . . And new high-traffic users will emerge

Solution: Next Generation Networks
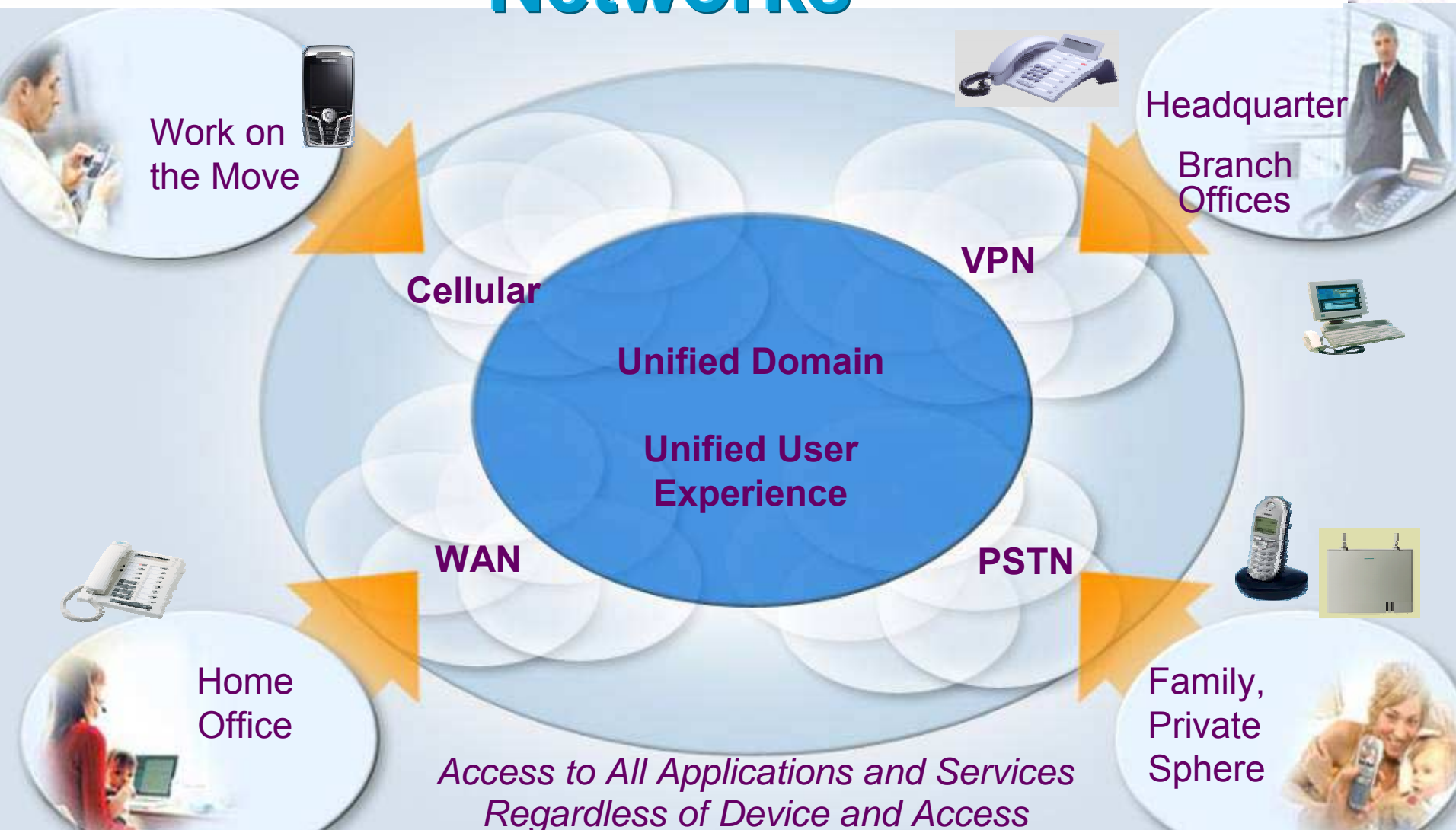
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Work on the Move

Headquarter

Branch Offices

Cellular

VPN

Unified Domain

Unified User Experience

WAN

PSTN

Home Office

Family, Private Sphere

Access to All Applications and Services Regardless of Device and Access

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SMART HOMES

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Home Networking

- At the heart of the digital home sits the Broadband access point distributing a host of enhanced content and services throughout the home

- Internet access
- Multiple voice lines
- Wireless printing
- Wireless IP Phone

IP Phone

Printer

PDA

Wireless Laptop
- Distance learning
- Video calls
- MP3 downloads

Wired Devices
- Streaming Video/Audio
- Print/file sharing

Broadband Internet Access

Triple Play Services
- Multiple devices served in a Home
- Commercial download
- TV guide

Windows

Broadband Access Point
- Multiplayer gaming
- Video on demand
- Home security
- Digital audio
- Domestic appliances

Wireless Gaming

Broadband Everywhere
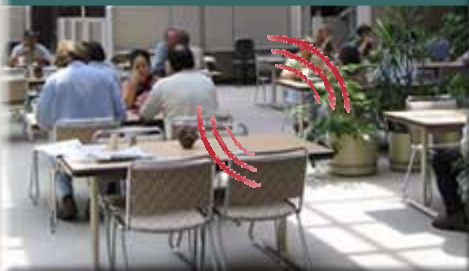

Internet Cafe

Digital Theater
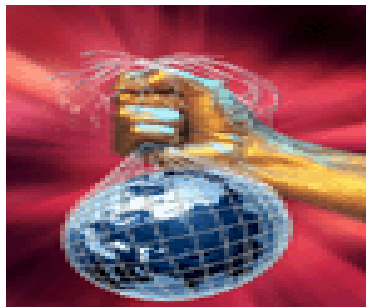
Shop, Museum

Hot Spot

Photo Service

Digital Studio

Cafeteria/Meeting Rm.

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The regulatory framework
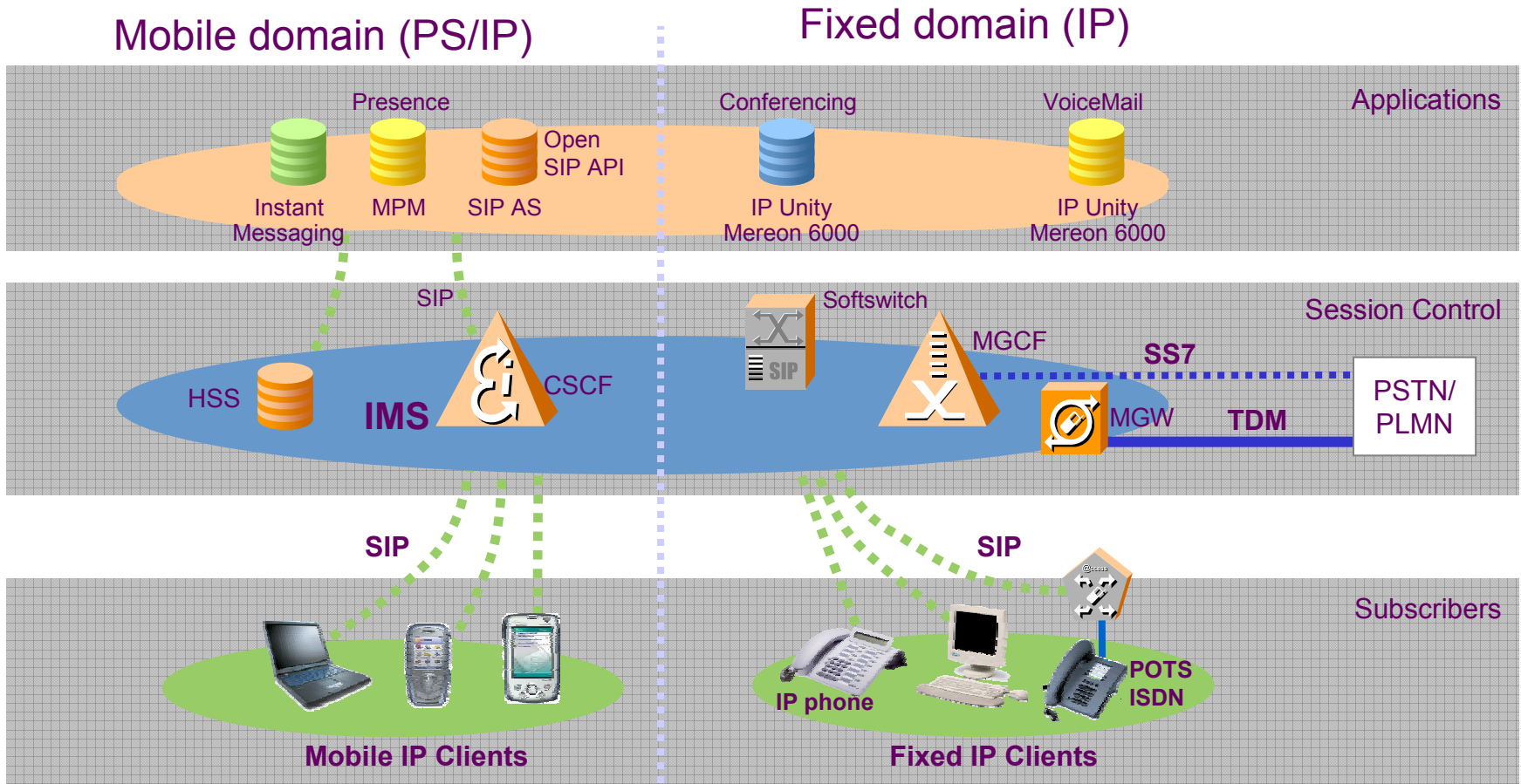
Think twice before…..!

- Success of GSM (and UMTS) is built upon a concerted industry approach.
- Requirements for roaming and interoperability are met.
- Globally harmonised frequency bands minimise requirements for multi-   mode / multi- band terminals.

- „Technology Neutrality" is supposed to provide a level playing field, but destroys economies of scale.
- Spectrum Trading provides new options for underutilized frequencies but increases risk of incompatibility and fragmentation.
- Suitable (harmonized) spectrum is hard to find and in high demand.
- New applications and usage scenarios blur the boundaries.
- The purpose of the frequency band should be retained: a cellular band should be used for cellular systems, if there is a demand? Mixing different types of Services in the same band causes fragmentation, inefficient use of spectrum and may result in lack of frequencies for the 'main' system.
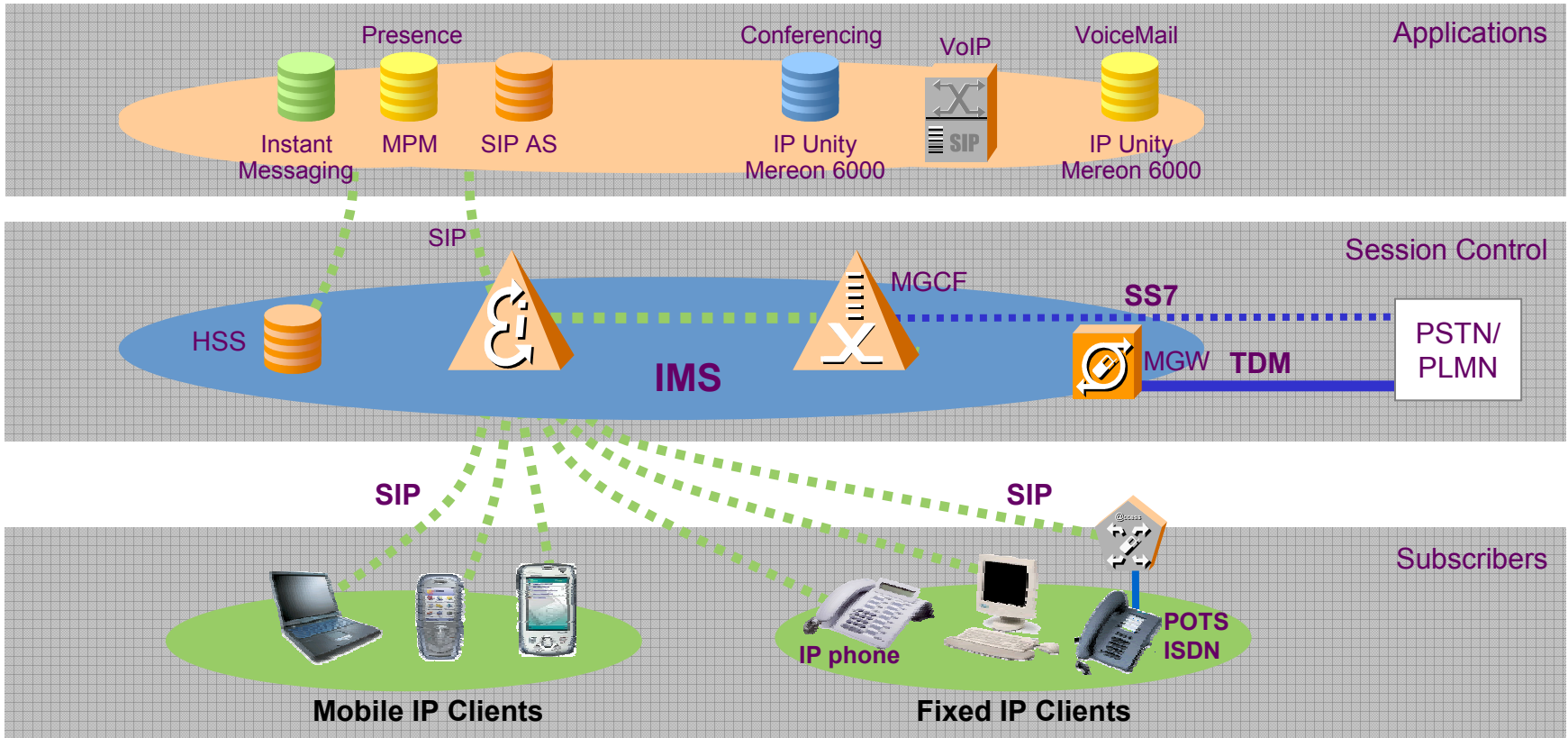
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Fixed Mobile Convergence

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Mobile domain (PS/IP)   **Fixed domain (IP)**

Applications

Presence — Conferencing — VoiceMail

Open SIP API

Instant Messaging — MPM — SIP AS — IP Unity Mereon 6000 — IP Unity Mereon 6000

Session Control

SIP — Softswitch

HSS — **IMS** — CSCF — SIP — MGCF — **SS7** — PSTN/PLMN

MGW — **TDM**

Subscribers

SIP — **SIP**

IP phone — POTS ISDN

Mobile IP Clients — **Fixed IP Clients**

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Converged Networks

Mobile domain (PS/IP)   Fixed domain (IP)

Applications
Presence — Conferencing — VoIP — VoiceMail
Instant Messaging — MPM — SIP AS — IP Unity Mereon 6000 — SIP — IP Unity Mereon 6000

Session Control
SIP — HSS — IMS — MGCF — SS7 — PSTN/PLMN — MGW — TDM

Subscribers
SIP — SIP
Mobile IP Clients — Fixed IP Clients — IP phone — POTS ISDN

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Session Insertion Protocol (SIP)

- **The World's most succesful call control Signaling protocol!**

- **Enables:**

"Find and Connect" over any network, a super-set of cellular telephony, redefines connectivity.

Applications are peer-to-peer entities that facilitate sharing and multimedia.

Mobile devices stay on line and networks are consolidated.

Application Servers

Cx

SIP   **SIP**

IMS Domain

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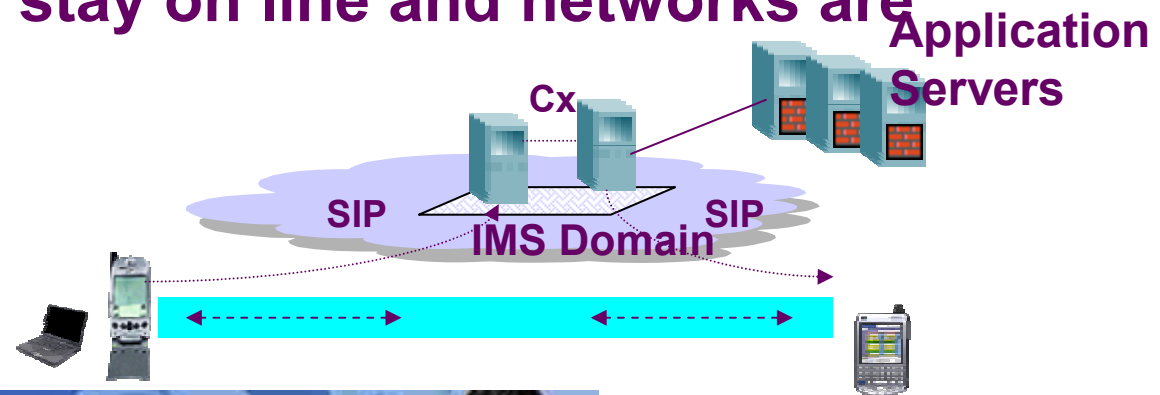
Triple play services driving the need for SIP/IPv6

More devices and services are becoming IP-aware . Consequently driving the need for increased network addressing and for "Plug and play" networking.

3D Game

VoIP

Video

Audio

- **Quality of Experience- Call set-up delay, voice latency, channel-zapping, packet loss.**
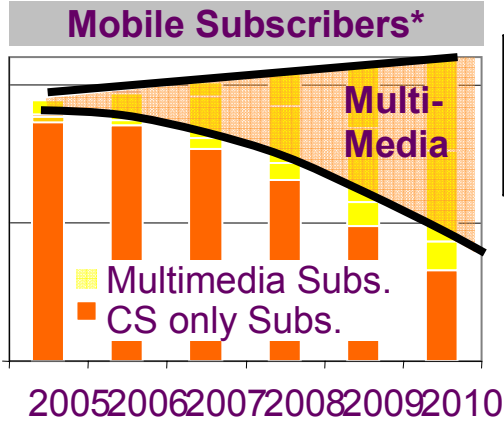- **Security-Dos attack impact on services such as VoIP and IPTV.**

Peer-2-Peer with SIP/IPv6

- Introduction of SIP-based peer-to-peer services is an important step after current client-server based services.

- IP Multimedia Subsystem (IMS) is a service infrastructure based on the use of Session Initiation Protocol (SIP).
  - End to end IP services
  - Increased potential for service integration
  - Easy adoption and integration of instant messaging, presence and real time conversational services.

- In order to make peer-to-peer services work between different operators' networks, IPv6 is needed - peer-to-peer services work well only with public IP addresses.
  - Small scale IMS deployment / piloting can be started with IPv4.
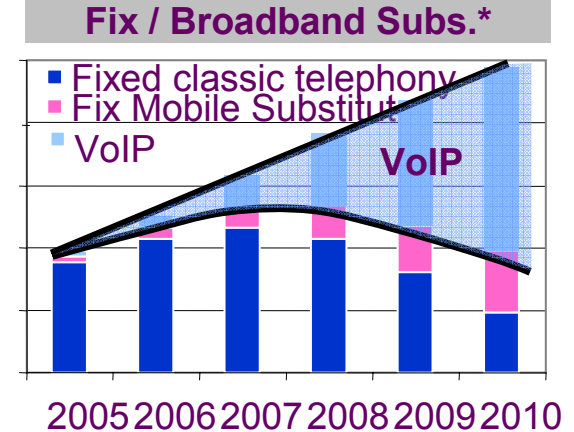 - IPv6 is vital for wider scale, global IMS deployment.
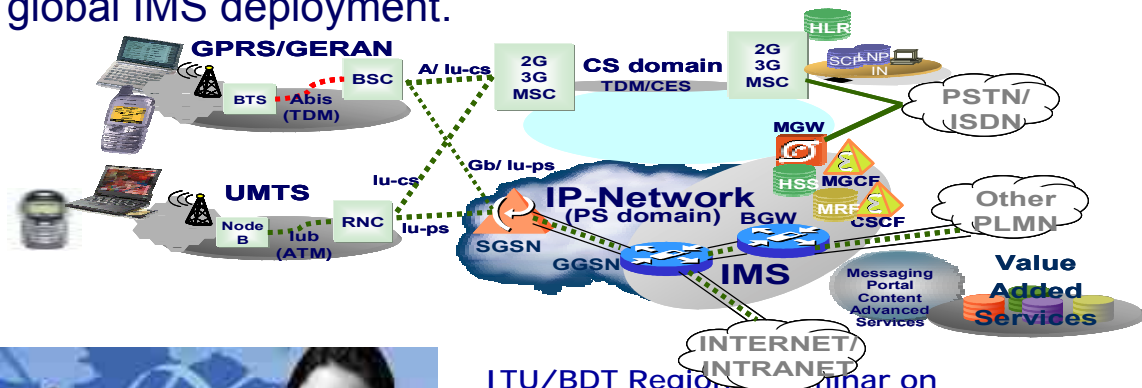
IMS Responding to Market Needs

Market Trends

Mobile Subscribers*

Multi-Media

Multimedia Subs.
CS only Subs.

2005 2006 2007 2008 2009 2010

Strong Demand for Multimedia Services

VoIP Market Boom on Fix / Broadband Access

Fix / Broadband Subs.*

Fixed classic telephony
Fix Mobile Substitut
VoIP

VoIP

2005 2006 2007 2008 2009 2010

Key Success Factor

Start rapid service deployments today on future prove infrastructure

Value Proposition

Most cost efficient IMS infrastructure for your best ROI from Multimedia and VoIP business

*Source: Siemens Marketing 2005

What does IMS provide?

- **Cost efficiency –best choice from a service architecture perspective.**
- **Mixed Multimedia**
  - **Ability to pick and mix various multimedia flows in single or multiple sessions**
  - **Can handle real-time voice, video, data**
  - **QoS**
- **Access Independence**
  - **Provides access to IP based services independent of the access network (mobile / fixed)**

Why do Fixed line Operators need IMS?

3D Game

VoIP

Video

Audio
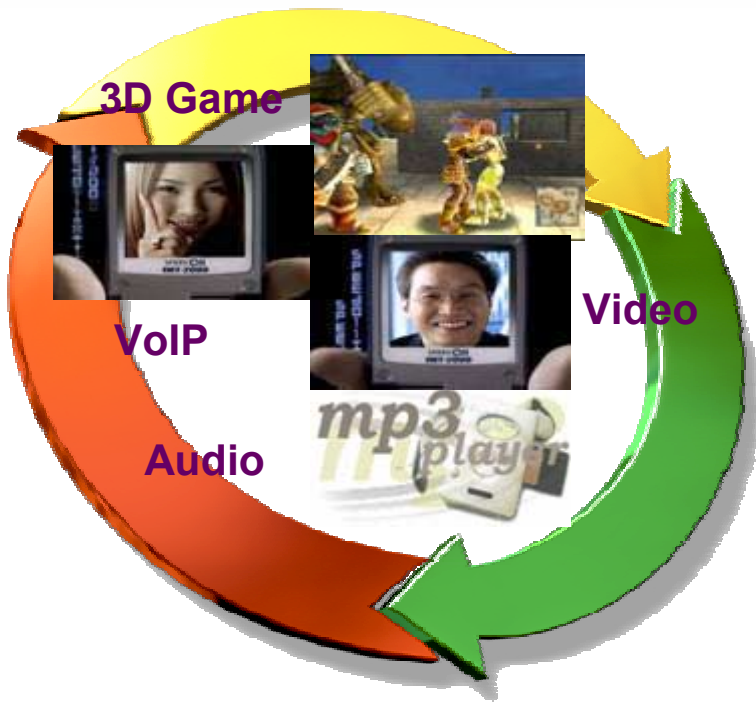
- **Threat of the Cable companies and their offering of Quadruple play services.**

- **Wireless Networks offering further evolution and new services.**

- **In search of something that will allow TDM equipment replacement and best choice from a service architecture perspective.**
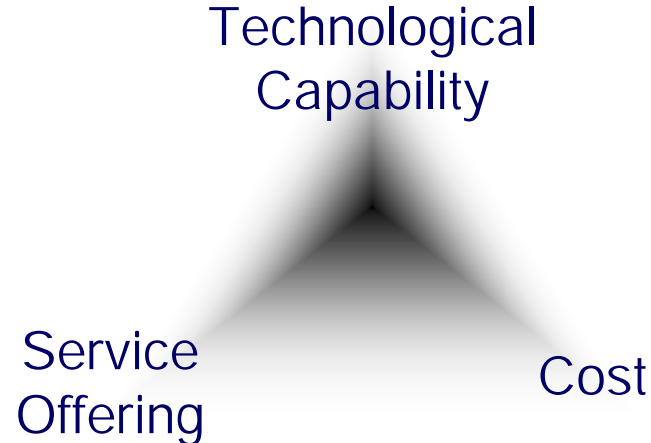
IMS is a Framework (horizontal infrastructure) where every operator can build their value chain!

TISPAN Project

Broadband

- **Not a question of only data rates and cost but also of services and user experience**
- **When the tripod is in balance; the creation and usage of content emerges with positive user experience**

Technological
Capability

Service
Offering

Cost

- **Business ecosystem:**
  - Content provider, Content aggregation, Invoicing, Transport provider(s), Technology providers

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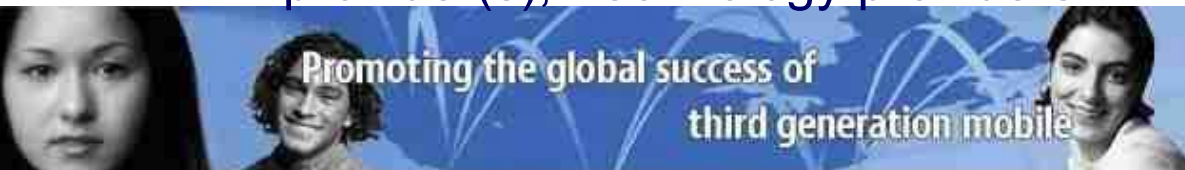
Significant Trends in Broadband Wireless Access technologies

- **Technology** – Significant improvements in wireless technology are enabling new services at lower costs than previously possible

- **Convergence** – Carriers are attempting to increase efficiencies by providing more services with fewer network elements

- **Applications** – New applications are arriving continuously, driven by open standards and convergence

- **Standardization** – Cooperation in the wireless access industry is being driven by large players who are looking to lead the next wave of wireless adoption

- **Mobility** – Handheld devices are starting to provide sufficiently usable form-factors that could drive mobile broadband adoption

- **Data** – Consumers demonstrate a huge appetite for data

- **Globalization** – Increasing affordability and recognition of the value of communications worldwide

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Wireless Broadband

Today's consumers have increasingly high expectations for their access needs

- **Data services**
  - More applications, bigger files, higher speeds
  - New devices such as iPod and personal video players are driving "heavy" content that is inconvenient at low data rates. Real-time services are becoming popular, including video - streaming of video and TV are on the horizon.
- **Price**
  - Bandwidth as a commodity due to increased demand
  - Cheaper applications available to consumers at a quicker release pace
- **Sophistication**
  - More dynamic IP applications
- **Mobility**
  - Consumer perception that wireless access is "mainstream and easy" – Cellular, WiFi, Bluetooth coupled with improvement in devices (e.g. display, battery)
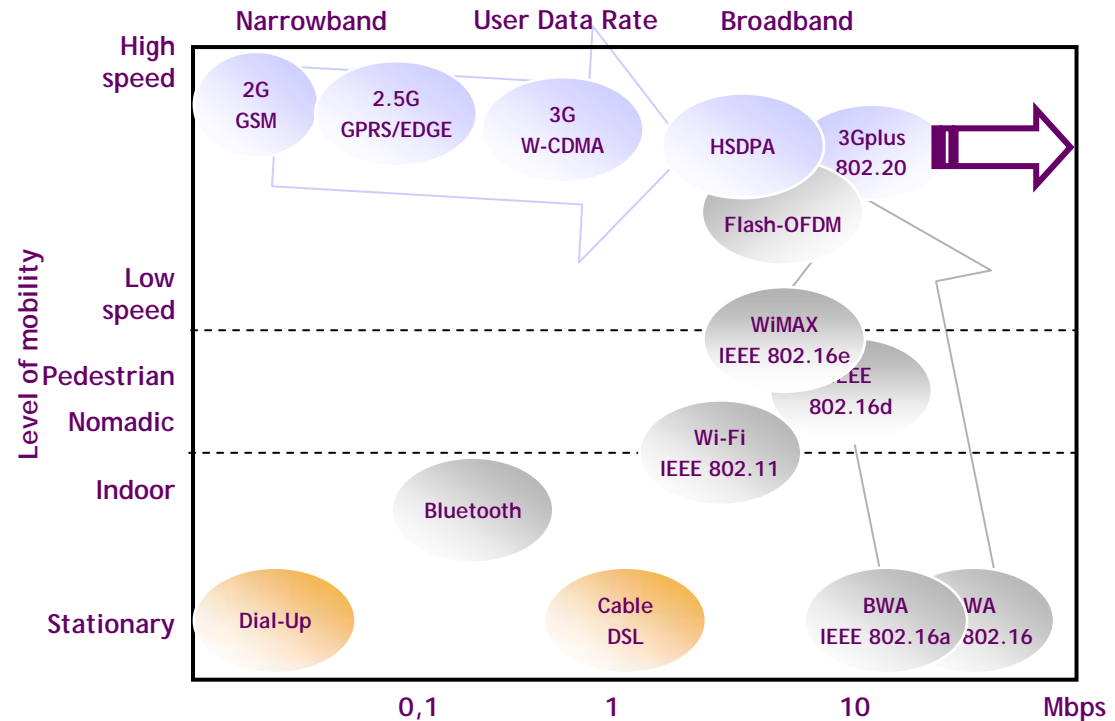
Trends in Mobile Broadband

Cellular technologies become more and more broadband and still evolving!
(TDD-HCR, TDD-LCR, HSDPA, HSUPA, HSXPA+, LTE)

Complementary wireless technologies become more and more mobile
(WiMAX, Flash-OFDM, 802.20)

	Narrowband	User Data Rate	Broadband

Level of mobility:
- High speed: 2G GSM, 2.5G GPRS/EDGE, 3G W-CDMA, HSDPA, 3Gplus 802.20
- Flash-OFDM
- Low speed: WiMAX IEEE 802.16e, IEEE 802.16d
- Pedestrian
- Nomadic: Wi-Fi IEEE 802.11
- Indoor: Bluetooth
- Stationary: Dial-Up, Cable DSL, BWA IEEE 802.16a, WA 802.16

0,1   1   10   Mbps

Several technologies compete for mobile Broadband:
- **HSDPA is the most promising candidate, not all can win.**

Source: Siemens Status: August 2006

3GPP Long Term Evolution (LTE) philosophy

- Current LTE focus is on enhancement of the Universal Terrestrial Radio Access (UTRA)

- With HSDPA+ and Enhanced Uplink, UTRA will remain highly competitive for several years

- LTE project aims to ensure the <u>continued competitiveness</u> of the 3GPP technologies for the longer term (10 years and beyond)

- Similar initiative underway for GERAN (GSM/EDGE radio access)

Spectrum issues

- Spectrum flexibility
  - E-UTRA to operate in 1.25, 2.5, 5, 10, 15 and 20 MHz allocations…
  - uplink and downlink…
  - paired and unpaired
- Co-existence
  - With GERAN/3G on adjacent channels
  - With other operators on adjacent channels
  - With overlapping or adjacent spectrum at country borders
  - Handover with UTRAN and GERAN

    Possibly not a mandatory requirement (to help reduce network and terminal complexity)

Mobility

- The Enhanced UTRAN (E-UTRAN) will:
    - Be optimised for mobile speeds 0 to 15 km/h
    - Support, with high performance, speeds between 15 and 120 km/h
- Maintain mobility at speeds between 120 and 350 km/h
    - And even up to 500 km/h depending on frequency band
    - Support voice and real-time services over entire speed range
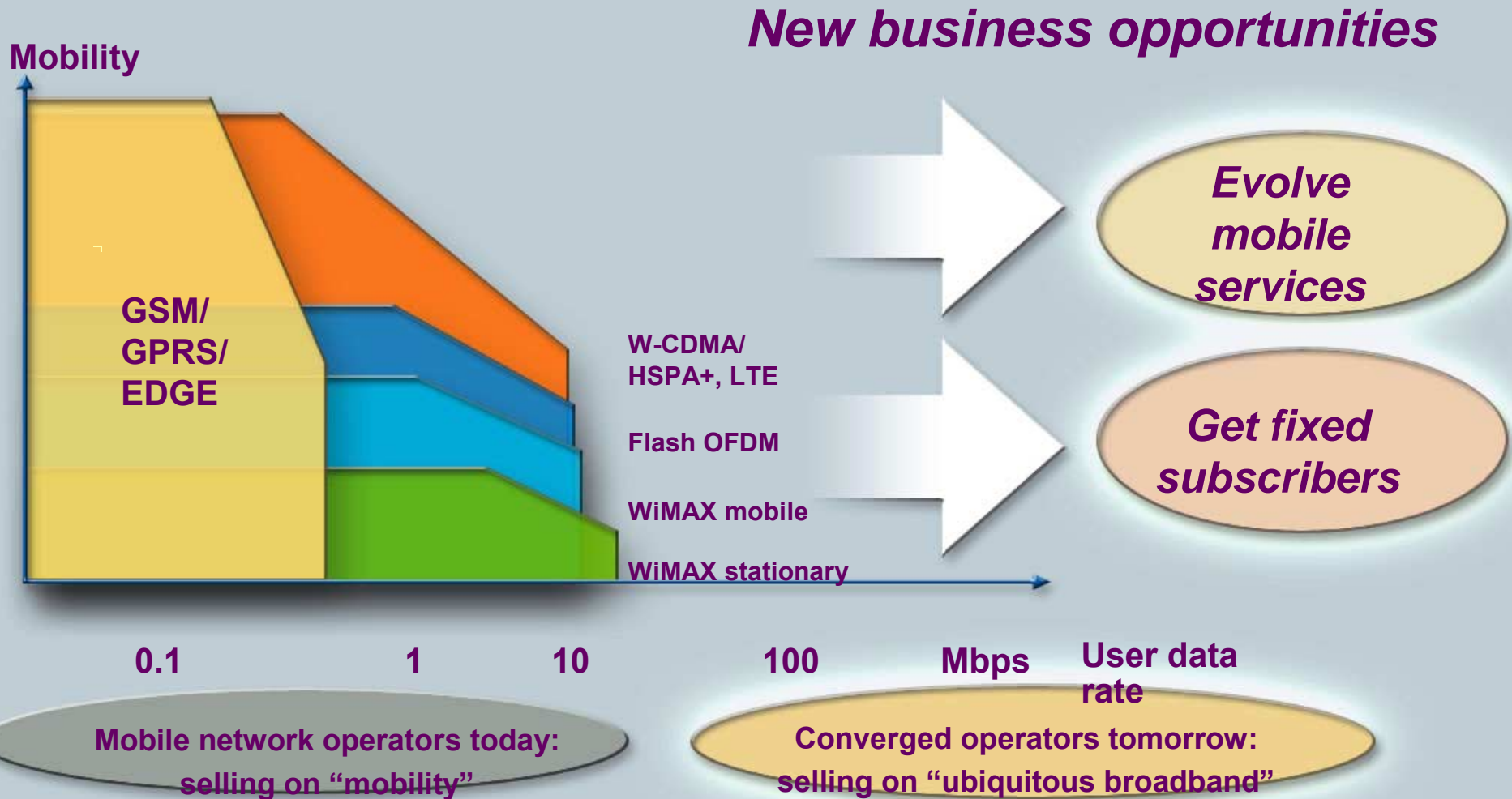   - With quality at least as good as UTRAN
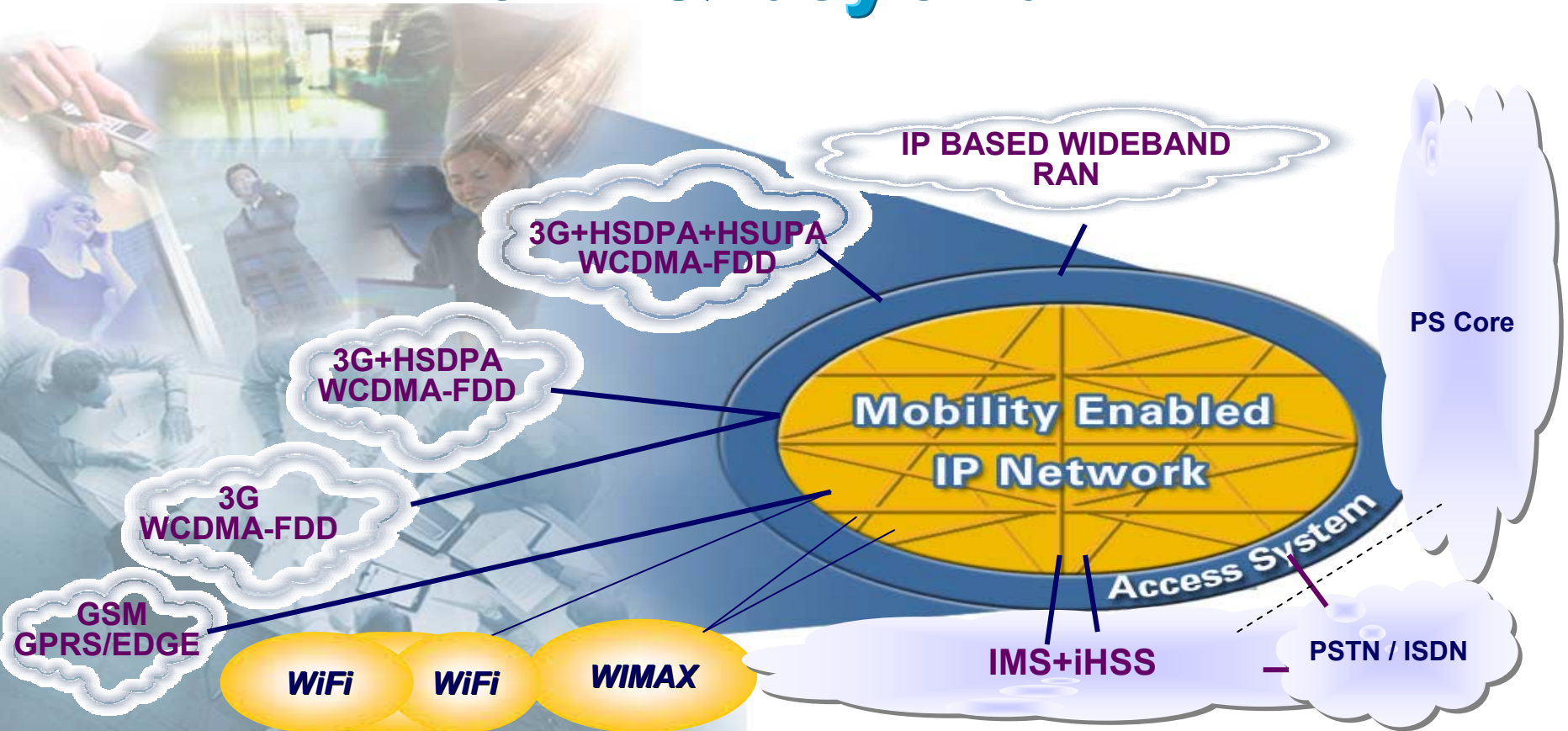
Cost considerations

- **Optimisation of backhaul**
- **Maximised re-use of existing sites**
- **Maximise Multi-vendor interface**
- **Terminal complexity and power consumption to be optimised/minimised**
- **Avoidance of complicated architectures and unnecessary interfaces**
- **Efficient OAM&P (Operation, Administration, Maintenance and Administration, Provisioning)**

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Broadband technologies that complement one another as they evolve

New business opportunities

Mobility

GSM/ GPRS/ EDGE

W-CDMA/ HSPA+, LTE

Flash OFDM

WiMAX mobile

WiMAX stationary

Evolve mobile services

Get fixed subscribers

| 0.1 | 1 | 10 | 100 | Mbps | User data rate |

Mobile network operators today: selling on "mobility"

Converged operators tomorrow: selling on "ubiquitous broadband"

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The Vision towards one integrated network 2012 & beyond

IP BASED WIDEBAND RAN

3G+HSDPA+HSUPA WCDMA-FDD

3G+HSDPA WCDMA-FDD

3G WCDMA-FDD

GSM GPRS/EDGE

WiFi **WiFi** **WIMAX**

Mobility Enabled IP Network

Access System

PS Core

IMS+iHSS

PSTN / ISDN

2002-03 64-144kps	2003-04 64-384kbps	2005-06 384-5Mbps	2006-07 3-20Mbps	2008 10-50Mbps	2010 20-100Mbps	2012 & beyond 20+to 100+ Mbps

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Forum
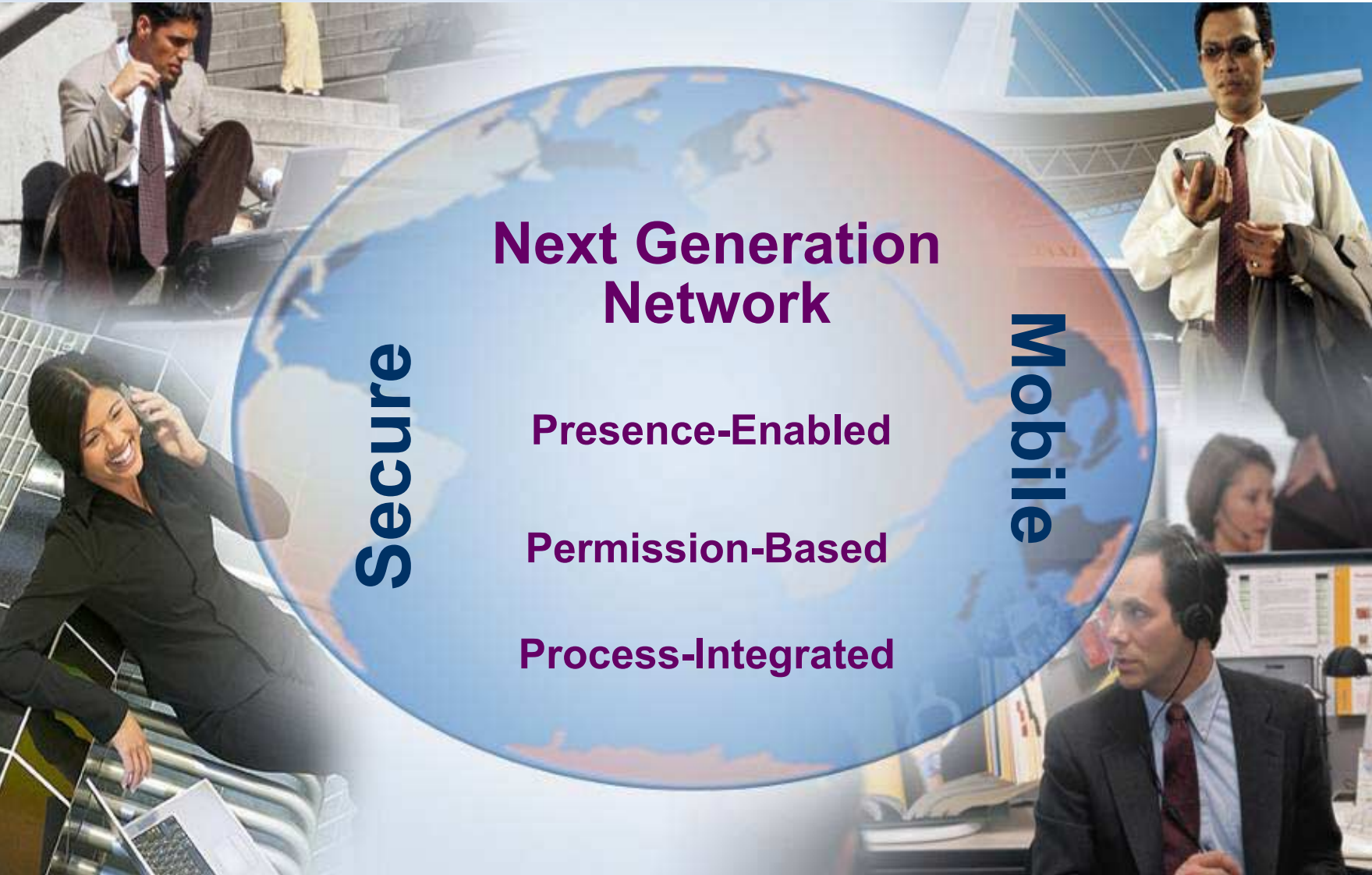
Next Generation Network

Secure

Mobile

Presence-Enabled

Permission-Based

Process-Integrated

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Wireless Broadband for all

Service bundling:
- Fixed Telephony
- Internet access
- IP-TV
- …

Access anywhere

IP Telephony

IP-TV

Video-on-demand

Machine to machine

Internet

Video telephony

Broadband Everywhere

Information & entertainment
- News
- Sports
- Music
- Games

Messaging
- Picture messaging
- Video messaging
- Email

E-government

E-healthcare

Enterprise Access
- Work@home
- Calender
- Email
- Intranet

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ITU/BDT Regional Seminar on Broadband Wireless Access Africa

20th September, 2006, Yaoundé, Cameroon

Technology and Service

Next ?

3G

2,5G

2G

SMS

Video on Demand, Broadband Internet

Videocalling, Videoconference, MMS, Mobile TV, e-mail, Mobile Internet, Mobile Office

MMS, Mobile TV, e-mail, Mobile Internet, Mobile Office

Multimedia

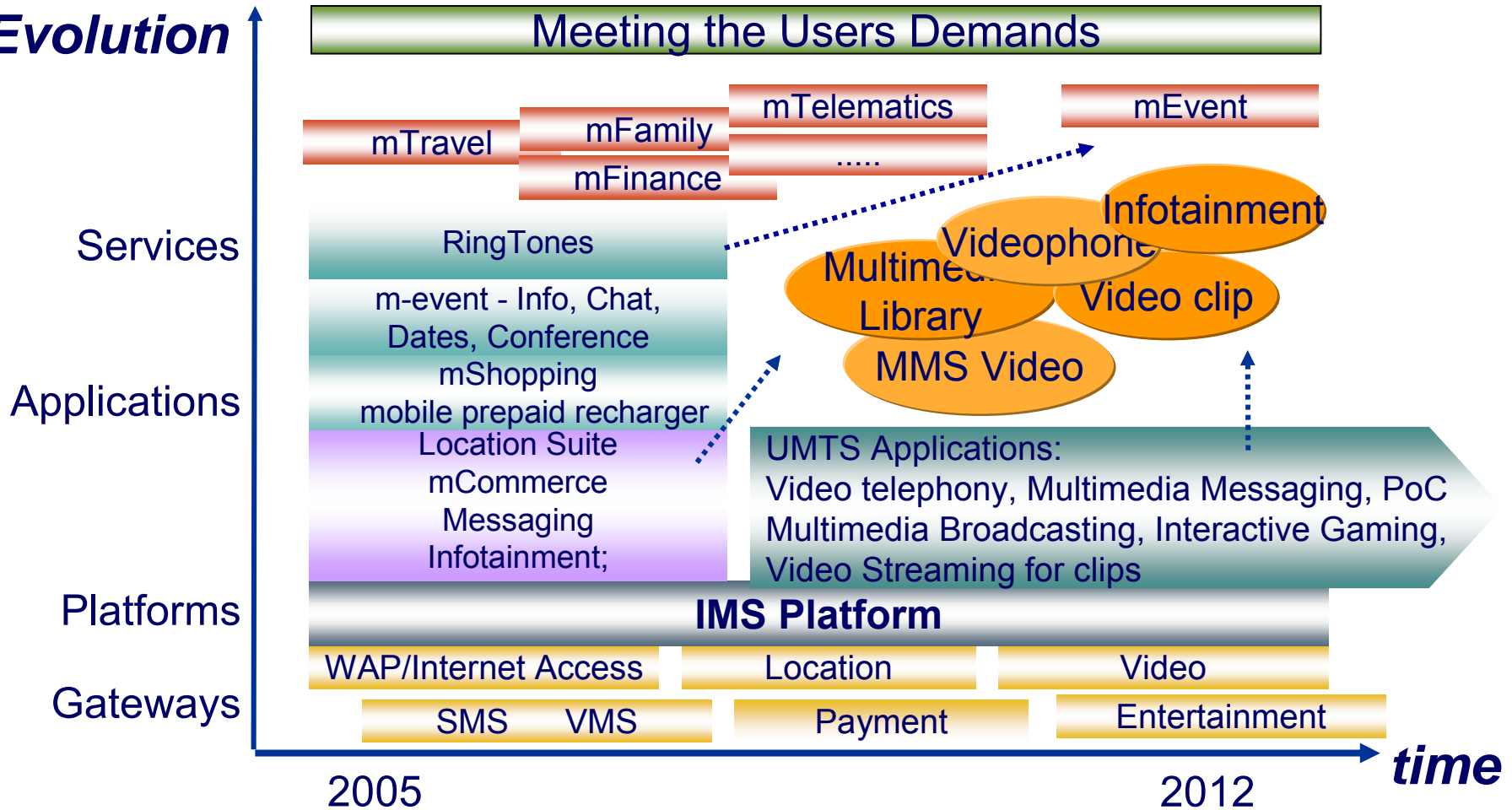Promoting the global success of third generation mobile

A world of 3G/UMTS services

Information, entertainment, news, interactive games, video & movie clip downloads, high quality streaming video, video telephony and conferencing, mobile TV, video messaging, sports highlights, audio, ringtones, location-based services, mobile Internet & email, voice… *AND MORE*

...And it's Roadmap

Evolution

Meeting the Users Demands

Services

mTravel
mFamily
mTelematics
mEvent
mFinance
.....

RingTones

Infotainment
Videophone
Multimedia Library
Video clip
MMS Video

Applications

m-event - Info, Chat, Dates, Conference
mShopping
mobile prepaid recharger
Location Suite
mCommerce
Messaging
Infotainment;

UMTS Applications:
Video telephony, Multimedia Messaging, PoC
Multimedia Broadcasting, Interactive Gaming,
Video Streaming for clips

Platforms

IMS Platform

Gateways

WAP/Internet Access
Location
Video
SMS   VMS
Payment
Entertainment

time

2005

2012

33

Device availability
Manufacturer's market vision…

2H 2005
Nortel: HSDPA datacards commercially available
Ericsson: HSDPA PC cards, 1.8 Mbps

1Q 2006
Nortel: HSDPA Handsets commercially available

1H 2006
Ericsson: First HSDPA handheld terminals, 3.6 Mbps PC cards in volume

2H 2006
Ericsson: Mass market 3.6 Mbps terminals, G-RAKE (high resolution screens, high update rate, 4 Megapixel cameras), 2nd generation PC cards (7.2 Mbps, G-RAKE / Dual antenna)

Q2 2007
Nortel: HSUPA commercial datacards expected

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SUMMARY

- IMS offers the platform for 3G evolution and service convergence.

- Next Generation Networks will be a «gathering together» of a number of solution towards a full IP Network.

- The experience of 3G / UMTS and INTERNET and Fixed Networks will play a major role in defining.

- With HSDPA / HSUPA evolution and other new Broadband mobile technologies will significantly boost performance to achieve higher speeds & capacities and bandwidth.

- IEEE technologies such as WiFi & WiMAX present a valuable complement to operators' pure cellular portfolios.

- Spectrum is the most critical resource in wireless communication, worldwide roaming and economies of scale demand harmonization and should not challenged.

It's inevitable: IMS is the future Platform for NGN !!!!
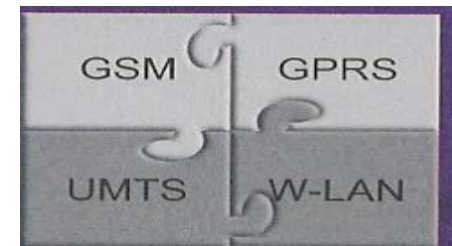
For more information…

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