UMTS and DVB-T Service Convergence for interactive delivery services

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OVERVIEW

CONVERGENCE
UMTS AND BROADCASTING
SYNERGIES
CONCLUDE
**Types of Convergence?**

- Different types:
  - Content
  - Transport
  - Spectrum Utilization

*Most important is Convergence between Different ITU services*
## End-customer expectations

<table>
<thead>
<tr>
<th>Freedom of choice</th>
<th>Challenges for the Operator</th>
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<tbody>
<tr>
<td>Present a broad variety of best-in-class services along with flexible pricing</td>
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<tr>
<td>Network independence</td>
<td>Provide services agnostic to networks and technologies</td>
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<tr>
<td>Personalized communication</td>
<td>Adapt services to context and user profiles</td>
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<tr>
<td>Unleash potential</td>
<td>Support corporate customers' business processes</td>
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Need for Convergence?

- Necessity to provide a product or service that differentiates between services that already exist.

- Broadcasters would like to enable interactive/data services on mobile terminals and hence need a return channel.

- Mobile Operators would like to enable high value services with minimum infrastructure investment.
Impact of Convergence?

Convergence impacts different areas:

– Policy and Regulation
– Services and Markets
– Industry alliances and mergers
– Technology and Network Platforms
– Standards
Operator evolution path to UMTS /3G

- **2G**
  - Circuit Switched

- **2,5G**
  - Packet Switched

- **3G**
  - Voice & low-speed data
  - Voice & medium-speed data
  - Voice & high-speed data
  - Voice & packet data
  - IP (option)

- **Beyond 3G**
  - W-CDMA
  - TD-CDMA
  - TD-SCDMA

- With HSDPA
- WiFi

IPv4/IPv6/SIP
IMS

10Mbit/s
Need to support truly Massive Networks
- Autoconfiguration
- Built in Security and QoS
- Designed to Operate as an Independent Protocol
- Multicasting
- Manageability
- Applications

Besides IPv6 Benefits (other than trillions of IP addresses)
Complementary to 3G/UMTS

Interoperability challenge will be on Application level!!!!

IEEE 802.xx Based:
- WiFi
- WiMAX Forum 802.16Revd/e
- Flash OFMA 802.20
Mobile IPv6 will provide roaming

Common Standards 3GPP/3GPP2
- HSDPA 14Mbps
- HSUPA 14Mbps
Cellular Roaming

Orthogonal Frequency Division Multiplexing (OFDM)
High Speed Download Packet Access (HSDPA)
High Speed Uplink Packet Access (HSUPA)
WiMAX offers wireless DSL services to both fixed and mobile network operators

Target business:
- Cost efficient solution to cover last mile for DSL (instead cables)
- Attractive opportunity for wireless DSL
  - different classes of service
  - different service bundles
  - dependent on CPE and use scenario
- Exiting opportunity for legacy voice service providers to offer high speed data access

Characteristics:
- Initially, wireless last mile solution
- High capacity
- Selective Quality of Service
- Incremental degree of mobility over time

- spectrum: 3.4 GHz and need for harmonization
Digital TV \hspace{2cm} Information Society \hspace{2cm} 3G

Other Delivery and Distribution Networks

Current Mobile Networks

TV & Radio, Cellular, Satellite Infrastructure

GSM \hspace{1cm} GPRS

UMTS \hspace{1cm} W-LAN
DVB / UMTS Framework

Broadcast world

- MHP
- MPEG-TS
- DVB-T/C/S
- DVB

Telecom world

- OMA
- MBMS
- Cellular
- UMTS

Source: Digital Video Broadcasting Project DVB
The DVB scenario

DVB system is a family of standards

Satellite

DVB-S QPSK

Broadcast

DVB-H

Cellular

DVB-T COFDM

Home

Cable DVB-C 64QAM

Earth Station
DVB –T in Europe

REST OF EUROPE

By 2010-2015 Whole of EC will have DVB-T installed.
Terrestrial Digital Television

DVB
- Sweden/Spain
- Belgium
- Croatia
- Czech Republic
- Denmark
- Finland
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Lithuania
- The Netherlands
- Norway
- Switzerland
- France

DVB
- Ukraine
- United Kingdom
- Portugal
- Poland
- Romania
- Slovenia
- Russia
- Nigeria
- South Africa
- Hong Kong
- India
- Singapore
- Thailand
- Australia
- New Zealand
- Brazil

8-VSB
- United States
- Canada
- Mexico
- Argentina
- The Philippines

ISDB
- Japan

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Mobile Broadcast Service Categories

- Passive Mobile TV
  - Scheduled TV Program
  - Video Streaming

- Interactive Mobile TV
  - Scheduled Program with Return Channel for Interactivity
  - Interactivity enabled

- Buffered Personalized Infotainment
  - Interactivity enabled

- Multiplayer Online Games
  - Quiz, Roll Play, Strategy-, Sport-, Adventure-Games
  - Interactivity enabled

- Location Based Traffic Guide
  - Car Navigation Support with real-time Traffic Information
  - Interactivity enabled

- Location

- Multiplayer

- Online

- Games

- Location

- Based

- Traffic

- Guide

- Car Navigation

- Support with

- real-time Traffic

- Information

- Passive

- Mobile TV

- Interactive

- Mobile TV

- Buffered

- Personalized

- Infotainment

- Multiplayer

- Online

- Games

- Location

- Based

- Traffic

- Guide

- Car Navigation

- Support with

- real-time Traffic

- Information

- Passive

- Mobile TV

- Interactive

- Mobile TV

- Buffered

- Personalized

- Infotainment

- Multiplayer

- Online

- Games

- Location

- Based

- Traffic

- Guide

- Car Navigation

- Support with

- real-time Traffic

- Information
Digital Video Broadcast

Standards:
- DVB-T (Europe), is currently deployed throughout Europe; derivate DVB-H (former DVB-M, DVB-X) (H=handheld) optimized for portability and mobility is targeted for introduction in 2005, compatible to DVB-T
- ISDB-T (Japan) – support for mobility
- ATSC (US) – no support of any kind of mobility (due to used modulation)

Target Services:
- public TV broadcast
- future: rich media services
- outlook: interactive services soon to come
### Mobile Network Operators

**Drivers:**
- Cannibalization of distribution channels
- Being excluded from the value chain
- Lack of knowledge of creation and repurposing of content

**Assets:**
- Return channel
- Charging mechanisms based on individual usage
- Distribution beyond national boundaries

**Expectations:**
- Participate in value chain of Media Industry and retain customer's satisfaction
- Repeat successfully established value proposition partnerships

### Media Industry

**Drivers:**
- Financing by advertising decreases
- Customer retention is expected to move from content to interactive screen

**Expectations:**
- DVB-H or/and MBMS is a new channel to widespread content to the global citizen and maintain branding
- Content may be charged on an individual base
- Offering interactivity
- Repeat successfully established value proposition partnerships

**Assets:**
- Best knowledge of generation and repurposing of content

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**But:** Media Industry does not aim to be restricted to a specific MNO’s subscribers.

To fulfill the expectations MNO’s contribution is not required.
Two alternative ways to "broadcast" TV, multimedia and infotainment services to mobile user equipment (e.g. mobile phones)

- **DVB-H**: (Digital video Broadcast for Handhelds) is tailored to the limitations (e.g. power consumption) of mobile handhelds.
- **MBMS**: (Multimedia Broadcast/Multicast Services) is a standardized multicast/broadcast service via GPRS and UMTS.

For i-DVB-H return channel and user specific content channels.

DVB-H: adds interactivity to DVB-H via GPRS/UMTS return channel.
The DVB-H Standard

Calls for new receiver to allow for:

- Datarates of up to 10 Mbit/s per Channel.
- Reducing Battery consumption by 100 milliWatts and hence a total saving of 60-90%.
- Up to 20 Videostreams with datarates up to 384kBit/s.
- Good Resolution on Display 360x288.
- Audio and Multiple data services e.g. Internet –Push Services, interactive Quiz-Games, Call Grandma, Radio in Top quality.
**DVB-H and MBMS Serve Complementary Needs**

### MBMS

- **0-64 kbps**
  - "Cost optimizing"
  - MMS info & streaming
  - Goal of the Day, mLearning, Real-time traffic info, News, Weather,..

### DVB-H

- **64-512 kbps**
  - "Service enabling"
  - TV with/without interaction / Pervasive multiplayer games
  - Movie Trailers / City Guide

- MBMS is a feature for GERAN/UTRAN
- DVB-H-operates within 174-862 MHz
CONCEPT REFERENCE MODEL

Content Aggregation

DxB

Mediation Gateway

User

UMTS

Portals

Internet

MHP

LBS

MHP = Multimedia Home Platform
LBS = Location Based Services
USER PERSPECTIVE

Broadcast Network

Content

Mobile Network Operator

Return Channel Processing

3G/UMTS

DVB-T

DVB-T – UMTS

3G /UMTS

Integrated DVB-T – UMTS Terminal

3G /UMTS

Content

Mobile Network Operator

Return Channel Processing

3G/UMTS

DVB-T

DVB-T – UMTS

3G /UMTS

Integrated DVB-T – UMTS Terminal
Mobile Broadcast (MBMS)

- Multimedia Broadcast and Multicast Service enables services via GSM and UMTS over IP.

- Consists of MBMS Service Center (AS), PO support (multicasting), Radio support (efficient handling of broadcasting over GSM/UMTS).

- MBMS is complementary to DVB-T/Cellular and seen as a hybrid service offering Platform.
Broadcast examples

- Announcement of available (MBMS) services (advertisement)
- Showing samples to attract users for Multicast or other services
- Advertisement of new PLMN services to users
- Advertisement channel in a shopping centre
- Emergency information (e.g. weather warnings)
Multicast examples

- News services (events, sports, weather, ...)
- Traffic information (global or localised)
- Entertainment (songs, video, adult services...)
- Corporate information channel
- Conferencing bearer

*Not well suited for applications which require very low transmission error rates (e.g. download of software)*
SYNERGIES

- UMTS return channel for DVB
- UMTS delivery path of Content for DVB
- DVB will be a useful multicast extension for UMTS
- UMTS will carry videos, so DVB is not only the video extension of UMTS
- UMTS and DVB will complement each other

Offering a mass unique market opportunities
Conceptional Phones

- Triband GSM/GPRS and UMTS Phones
- DVB-H Receiver
- 1.3 M Pixel Camera
- Display VGA (640x480)
- Touch Screen
- Stereo Output
- Bluetooth
- RS-MMC
- 1 Gbit internal Memory
Cellular Broadcast Convergence

Digital Video Broadcast

Voice Calls, WAP, SMS, MMS, ...

Interactive Infotainment Mobile Phone
Conclusions

- UMTS Release 5 and 6 provide compelling new features…
- The emphasis is now placed on developing innovative and revenue creating 3G/UMTS Services.
- The Combination of UMTS/DVB-T Services offers:
  - More attractive Audio and Video streaming and clips
  - More interactive Local and remote interaction
  - Increased customer base
  - Develop end-to-end system that enables the creation, delivery and consumption of converged services
- Convergence will have an impact on regulation and traditional service definitions.