Benefits by Convergence of Broadcasting and Telecommunications

Dr.-Ing. Chris Weck
Institut für Rundfunktechnik
München
Overview

Introduction

- Interactive broadcasting

Areas of benefits for broadcasters

- Interactive broadcasting to mobile receivers
- Non-broadcast services to mobile receivers

Benefits for broadcasters and mobile network operators

- Internet access of general and individual interest
- Example: IST project CISMUNDUS
- Terminal issues

Summary and conclusion
Introduction

Interactive broadcasting

- Classical broadcasting will always remain important
- But: interaction channel is interesting for various applications
- New broadcast services could be generated
- i-services are already evolving
- i-services are starting via cable and satellite
- Business models for future cable networks include interactivity
- MHP is the basis for a lot of multimedia services
Interactive broadcast services today

Examples of ARD and ZDF

- ZDF Kids programme: 1, 2 or 3
  - IFA 2001:
    - guess the right answer out of 3

- ARD „Verstehen Sie Spaß?“
- Candid Camera
Interactive broadcast services today

Travel information (ZDF)

News Ticker (ARD, WDR)
Areas of benefits for broadcasters

Broadcast content

- Distribution of broadcast content via telecom links (UMTS, GPRS, GSM)
  - Additional way of content distribution
  - Revenue owing to licence fees, intellectual property rights (IPR)
- Contribution of e.g. audio broadcast content via UMTS to the studio

Broadcast services

- Interactive broadcast services using GSM, GPRS, UMTS
  - i-services not only for stationary but also to portable and mobile devices
  - Using the available and established infrastructure of GSM or GPRS
  - UMTS is on the way (till 2004)

Broadcast infrastructure

- Interactive commercial services using DAB, DVB-T
- Synergy in network infrastructure (fibre primary distribution, site usage)
Interactive broadcast services using GSM, GPRS or UMTS

Broadcast applications for interaction channel using mobile communication

- Broadcast services
- Data carousel
- Error protection
- Internet access to sites of general interest
- Individual internet access

What are the benefits for broadcasters?
Broadcast services with interaction channel

- DAB / DVB-T
- GSM / GPRS
- UMTS / UTRAN

Programme making

Carousel

Mobile terminal

Mobile network

Base Station

MUX

DxB transmitter

Broadcaster

Mobile operator

ISP ...

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Benefits of broadcast services with interaction channel

Increased attractiveness of broadcasting services

- Request programme
- Feedback on
  - programme acceptance
  - powers of persuasion
  - forming of public opinion including the public
- Share experience
- Useful for
  - adapting services
  - increasing quality

Diagram:
- Broadcaster
- programme generation
- MUX
- DxB transmitter
- DxB
generation
- Services
- GSM / GPRS
- UMTS / UTRAN

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Benefits of data-carousel services with interaction channel

Increased attractiveness of datacasting services

- Request data
  - based on highest request
- Feedback on
  - user requirements
  - acceptance
- Useful for
  - adapting services, e.g., to regional aspects
  - increasing service quality
Benefits for data services when using GPRS/UMTS for error protection

Retransmission of erroneous data packets via the individual interaction link

- Advantages for downloading large files, MP3, software, etc.
  - faster access
  - large data carousels are possible
  - safe and reliable transmission, even for mobile DAB/DVB-T reception
Access to Internet pages
point-to-(multi-)point-systems

The most efficient way is to combine broadcast and mobile communication systems

- **UNICAST:**
  - point-to-point
  - GSM, GPRS, UMTS

- **MULTICAST:**
  - point-to-multipoint
  - UMTS, DAB, DVB-T

- **BROADCAST:**
  - DAB, DVB-T
Combined access to internet pages

- Transmission of most interesting pages in the broadcast channel
  - up to a limited depth of details
- Transmission of further details via the mobile channel
  - establishing a connection for individual access to pages automatically
  - of course with confirmation by the user (chose speed at the price of ...)

Benefits for broadcaster

- offering a portal to the internet
- attractive services
- no limitation
- benefit for mobile operator
Benefits for mobile network providers
Combination of DAB/ DVB-T and GSM/ GPRS/ UMTS

Attractive services

- wide range of new broadband multi-media services
  - cheap and high quality entry for users into the interactive world
  - broadcasters start and create the appetizer for individual information
  - mobile operators supplement the service

Interaction channel is initiated via a mass medium

- volume of individual traffic will increase very much
  - broadcasters have a huge public
  - mobile operators want to have a huge public

Mobile operators which co-operate with broadcasters
will easily compete with single mobile operators!
Benefits for broadcasters

How can a broadcaster benefit from the fact that mobile network operators benefit from combined services?

- Win-win situation?
  - the mobile operator gets the mass of the public and has a chance to earn a lot of money
  - the public broadcasters can extend their services, but money ???

- But ...
  - mobile operators usually offer terminals on a subscription bases
  - if mobile operators include DAB or DVB-T in their offer they will have much more revenue
  - ...a very fast penetration of DAB/DVB-T terminals would be possible
Use of broadcast infrastructure for non-broadcast services

- DAB / DVB-T
- GSM / GPRS
- UMTS / UTRAN

- Broadcaster
  - MUX
  - DxB transmitter

- Mobile terminal

- Mobile network
  - Base Station

- ISP ...

- Service creation

- Carousel

- Mobile operator
Use of broadcast infrastructure for non-broadcast services

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Broadcaster

MUX

DxB transmitter

DxB transmitter

Mobile terminal

Mobile terminal

Mobile network

Base Station

Mobile network

Base Station

carousel

service creation

service creation

ISP ...

ISP ...

mobile operator

mobile operator

GSM / GPRS

GSM / GPRS

UMTS / UTRAN

UMTS / UTRAN

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Benefits in the case of non-broadcast services over DAB/DVB-T

(1)
Synergistic use of broadcast infrastructure

- today commercial advertising (certain percentage of time)
  - (20 sec. TV = 11 MByte data)
- tomorrow commercial data (certain percentage of capacity)
  - another way of seeing commercials
- e.g. UMTS services in the broadcast multiplex
  - still regulatory questions to solve
  - attractive broadband services (large files, MP3, videos, ...)
  - large coverage for regional services
    - network and transmitter coverage area
Benefits in the case of non-broadcast services over DAB/DVB-T

(2)

Penetration of mobile DAB/DVB-T receivers

- UMTS services in hot-spot areas via DAB/DVB-T
  - attractive broadband services, high data rates
- Broadcast services to a huge number of combined terminals
What mobile terminals?

Notebooks?
- 6% of population in Germany have a notebook
- probably everybody who has a notebook has a mobile phone
- DAB and DVB-T receivers with USB interface are available

Combined Terminals
- PDA with DAB is available
- DVB-T with GSM is reality
- UMTS with DVB-T - will it appear?
- .... other combinations?
**UMTS and DVB-T or DAB in one terminal**

Estimation of required processing power in a future with software (defined) radios (SDR)

- **DAB** 1200 MIPS
- **DVB-T** 5000 MIPS
- **GSM** 500 MIPS
- **GSM/GPRS/Edge** 1200 - 2500 MIPS
- **UMTS** 11600 MIPS
  - but UMTS Tx/Rx each 5800 MIPS
- **SDR: DxB-T/UMTS Rx** ? 11600 MIPS
  **UMTS Tx**
- **Hyperlan/2** 13000 MIPS
- **DVB-T/UMTS/MHP ?**
Example: CISMUNDUS

Convergence of IP-based services for mobile users and networks in DVB-T and UMTS systems

- European IST-Project
- Considering future broadcast and mobile radio convergence
- Partners
  - Brunel University
  - France Telecom (FT R&D)
  - IRT
  - Motorola
  - Philips Research Labs
  - RAI
  - TDF
**CISMUNDUS Idea**

- **Server**
- **Server**
- **Server**
- **Server**

**DVB-T Network**

**Co-ordination**

**UMTS Network**

**Internet**

- **Hot spots:** (Malls, stations, vehicles, etc)
- **Individual users:** out-door, in-door, on the move, "anywhere"
- **No local gateway**

**Local Gateway: DVB-T & UMTS repeaters or (optionally) WLAN**

**Hot Spots (mainly in closed areas):** airports, stadiums, mass transportation, etc.

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*Source: Markus Berg/Andreas Sieber*
MHP in mobile devices (e.g. UMTS/DVB-T)

Why to use MHP, the multimedia home platform, in portable and mobile devices out of the home?

- simple user interface
- simple user guidance into the interactive world
- safe and reliable software environment (Java, API)
- safe e-commerce and security manager
- combination of anonymous broadcast channel with individual internet access
  - allows for anonymous information of the customer
MHP is well suited for mobile devices, too

- small displays
- limited resolution
  - more likely TV than PC
- simple user interface
  - no keyboard required
  - remote control with cursor, ok and 4 colour pads
- easy to integrate in mobile devices
- people not very familiar with PC
  - will know MHP from TV
  - low fear to enter the internet world
  - MHP even to access the UMTS-services

New mobile phone from Ericsson T68m

Joystick
left, right, up, down, ok

Why not color keys as used by MHP?
Who will use MHP in mobile devices?

Which target group?

- young people
  - familiar with new technology
  - usually have less money
- senior people
  - familiar with TV and MHP
  - usually have more money

Get both target groups by applying MHP in UMTS and DVB-T terminals!

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Joystick
left, right, up, down, ok.

Why not color keys as used by MHP?
Benefits of mobile devices able to receive MHP/DVB-T/DAB/GPRS/UMTS?

For UMTS service providers:
- larger subscriber basis
- access to i-services is easy and well known from the TV

For Broadcasters:
- high number of MHP and DVB-T mobile receivers available
  - lower prices of devices
  - synergy, because UMTS pressure for research and development
    - high integration (100x) and high processing performance (1000x)
    - low energy consumption (100x)
  - horizontal markets, various distribution links of i-services
Summary

Interactive broadcast services are evolving
- allowing attractive new services
- starting stationary
- will extend to portable and mobile

Wireless 3G technologies have a favourable effect:
- Benefits for broadcasters
- Benefits for mobile operators
- Benefits for users
Conclusion

Standardisation Areas

- Content management
  - (e.g. meta data, IPR)
- Service and access management
  - Multiplexing, EPG, IP over broadcast channels (e.g. carousel)
  - Broadcast channels over IP (e.g. streaming)
  - Interaction channel
  - Billing
- Network Co-ordination
  - Network selection/handover (operator), Network selection (user)
  - Routing (e.g. within broadcast networks, error substitution)
- User terminal
  - Interoperability (API, MExE, MHP, ...)
  - User interface (usage philosophy)
Thank you!

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