Tutorial on Audio Visual Media Accessibility

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4. Producing and delivering access services – the options

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Check list

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Content
What does this tutorial cover?

TV accessibility:

- Producing and distributing subtitles, audio description/subtitles and visual signing
- The current situation in the European Union and Japan
- Legislation, regulation and funding
- Digital switchover and analogue shut-off
- Setting standards with or without a joint multi-stakeholder forum

Outcomes
What will I be able to do?

At the end of this session, you should be able to answer questions like these

- Workflows - what does producing access services entail?
- What standards are in use that cover access services?
- Bandwidth requirements – what does it take to encode and deliver media and access services to their intended users?
- What impact on TV accessibility does a joint forum on digital TV have?

Current Situation in EU (1)

- Most EU member countries started their digital TV deployment with or without access service provisions.

- Some high-end manufacturers have started using “pan-European” platforms with minor localisations in their own versions of middleware.

Current Situation in EU (2)

- Private Pay TV Operators managed to implement access services

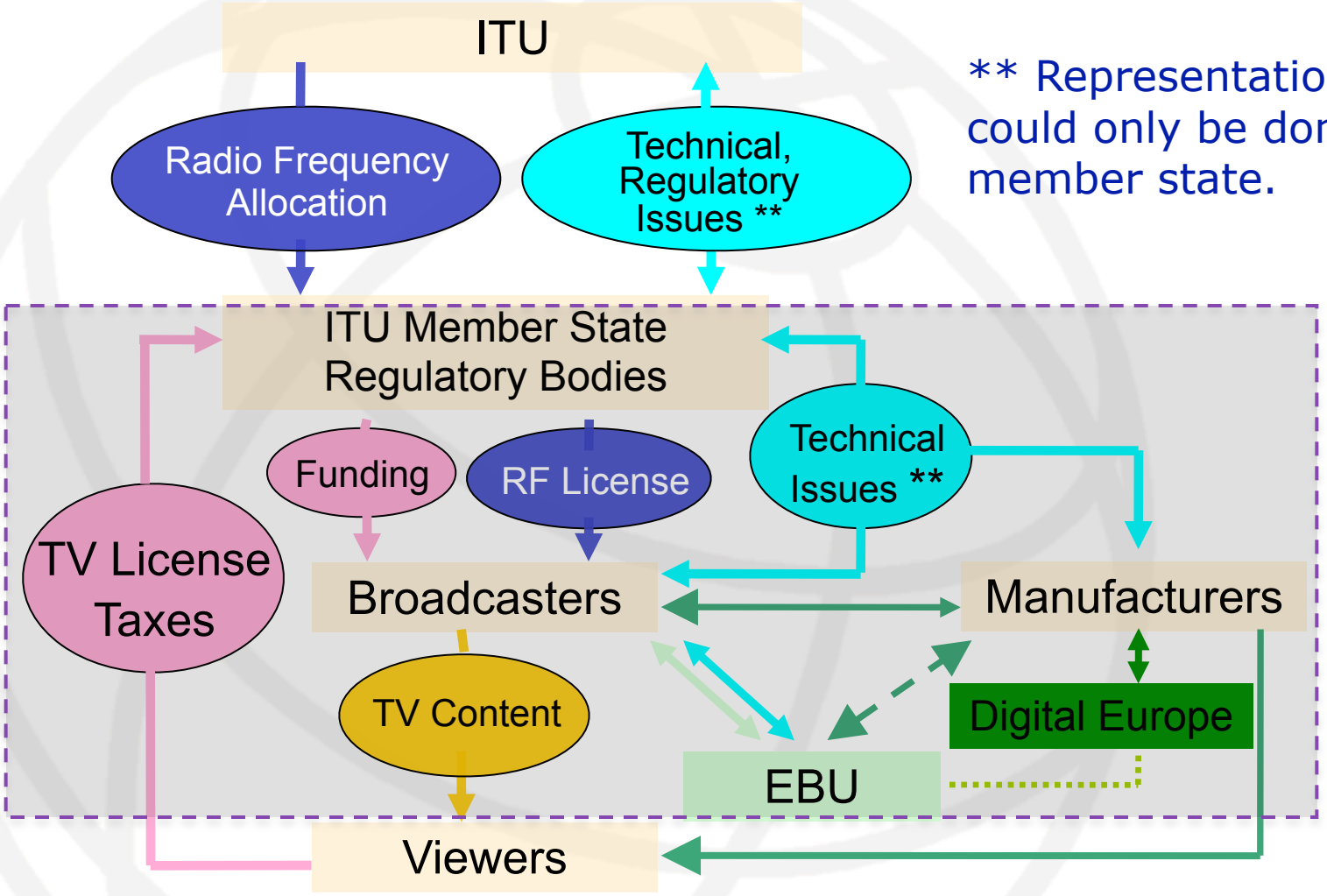
  ← in full control throughout the delivery chain (content production – broadcasting – receivers).

Current Situation in EU (3)

- Public Broadcasters may not be in the same position

  ← may not be in control of the receivers (Set-Top-Box, Integrated DTV), funding and resource issues.

Chain of Power/Funding Public Broadcasting in EU



** Representations at ITU could only be done through a member state.

a joint forum
e.g.
DTG (UK)
NORDIG
(Nordic countries & Ireland)

Political pressure works? (1)

OfCom (UK) introduced a Quota system to Subtitles and Audio Description. BBC and other broadcasters met the targets.

<- strong competition from Private Pay TV Operators

Political pressure works? (2)

Ministry of Internal Affairs and Communication (Japan) introduced a Quota system (6 am – 11 pm) to Subtitles and Audio Description with some financial incentives. *

* A sign language translation has not been in the quota, due to a directive from the Ministry of Education. The primary education for the deaf students includes the reading and the writing skills of Japanese language.

Political pressure works? (3)

- A Quota system could be abused.

  e.g. To fulfil the quota, a programme with access services repeatedly broadcast in the 2 - 4 am slots (Ireland).
- Time slot issue

  < quota for the 6 am to 11 pm slot (Japan)
- Detailed monitoring may be needed

  < automatic monitoring system (Spain)

Analogue to Digital Switch Over (1)

For Analogue Terrestrial Transmission

- Video System
  - NTSC: 525 lines (480i), 30- Hz
  - PAL/SECAM: 625 lines (576i), 25 Hz
- Bandwidth (7 MHz, 8 MHz)
- Channel Allocation (VHF, UHF)

Analogue to Digital Switch Over (2)

For Digital Terrestrial Transmission

- Video System (DVB, ISDB, ATSC)
- Chanel Allocation (VHF, UHF)
- Video Compression (MPEG 2, MPEG 4)
- Video Format (480i, 576i, 720p…)
- Service Information and Metadata
- Subtitle format (bitmap, text) etc

More parameters to be set and negotiated… by/with whom and how??

Analogue to Digital Switch Over (3)

For Digital Terrestrial Transmission, introduction of additional services:

- Electronic Programme Guide
- Interactive Audio Description (Video Description)
- Dialogue only sound track for Hard of Hearing
- High Definition delivery etc.

May require some modifications in middleware, firmware…

Who would maintain them and how??

Joint Forum (1)

The Digital TV Group (DTG) is the industry association for digital television in the UK. The Group publishes and maintains the technical specification for the UK's Freeview and Freeview HD platforms (the D-Book) and runs the digital television industry's test centre: DTG Testing.

http://www.dtg.org.uk/dtg/objectives.html

Joint Forum (2)

NORDIG (**http://www.nordig.org/mainpage.htm**) for Denmark, Finland, Iceland, Norway, Sweden and Ireland

ARIB (**http://www.arib.or.jp/english/**) for Japan

Without a Joint Forum

- Confusion of Set-Top-Box manufacturers and viewers
- Subtitles: number of lines, scroll, buffer size…
- Audio Description: how to select

The Decoders must know the Encoding conditions; how the signal is encoded in which order.

Value Chain from content flow (1)

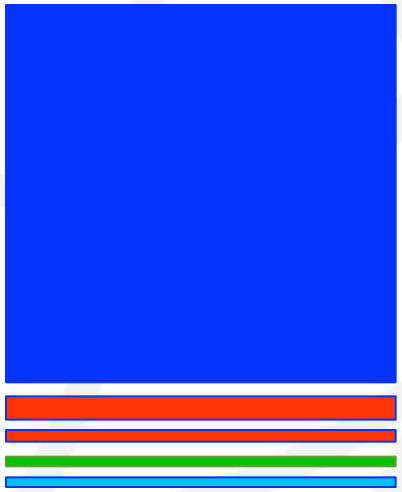
Production of TV Programme: Video with Audio

Production of Access Services: AD, subtitles

Production of Metadata: EPG, SI Table etc.

Aggregation of content into a TV channel

Playout (Video Transport Stream)



Main video
Main Audio (stereo)
AD (mono)
Subtitle
Metadata, SI table

Value Chain from content flow (2)

Playout (Video Transport Stream)

Aggregation of TV channels into TV service

- **Transport stream 1**
- **Transport stream 2**
- **Transport stream 3**
- **Transport stream 4**

TV multiplex

Distribution of service via transmission network

Value Chain from content flow (3)

TV receiver and decoder

TV display device (vision + audio)

Remote Control Device

TV programmes

Access services

Information about TV and Access Services

Standards for Subtitles (1)

Within the DVB Standard

- Code based (ETS 300 472)
  -- (originally for compatibility with Tele-Text)
- Bit-map (ETS 300 743)
  -- commonly used in Europe

Standards for Subtitles (2)

Within the DVB Standard

- Bit-map (ETS 300 743)

  converts the subtitle text into a rendered bit-map graphical object and transmits it as such.

  subtitle presentation options such as font style, colour, and size can be applied, and are controlled by the broadcaster.

  about 50 to 100 kbit/s required (more details from Nick Tanton, BBC and in book)

  http://www.acessibilidade.net/tdt/DVB_Subtitling_FAQ.pdf

Standards for Subtitles (3)

A sample of DVB subtitles – RBB (Germany)

Standards for Subtitles (4)

With the ISDB Standard
(ARIB STD-B37)

- Code based
- 16 k bit/sec required

http://www.arib.or.jp/english/html/overview/doc/6-STD-B37v2_4-E1.pdf

Audio Related Access Service (1)

- Audio Description (Video Description)
- Clean Audio
- Audio Subtitles

Audio Related Access Service (2)

Technically speaking, MPEG-2 audio can carry up to 96 channels.

- 5.1 channel stereo.
- Secondary voice channel in another language
- 56 k – 128 k bit/sec per channel required
- Parameter settings in SI Table required
- Functionality in STB, Remote control

Audio Description (Video Description)

Extra sound track describing the TV's visual information – scenery, location of objects etc.

Samples:

http://www.youtube.com/watch?v=-5cEOc7my2A

http://www.youtube.com/watch?v=qu0GYkuCrRg

http://www.youtube.com/watch?v=N3jGaZomjsw

http://www.youtube.com/watch?v=3ZkBB8YJ4CM

http://www.youtube.com/watch?v=fTxrAM1bp6o

Clean Audio

- Clean Audio is a sound track for those who have some hearing difficulties. To help them, the background noise are supressed, or a conversation only sound track is provided.
- Foreign Cinema and other materials may have a voice-only track that could be used for this purpose.
- **Cleaning of an existing audio mix is technically difficult.**

Sign Language Translator Video Signing (2)

Requirements

- a high frame rate to cover the quick movement
- a large enough size to read the facial expression

  -> resulting about 300k – 500k bit/sec with H264 compression, whereas the main SD video in MPEG-2 needs 4 – 8 Mbit/sec

Sign Language Translator Video Signing (3)

In a DVB system, a user mix of a Sign Language Translator video could technically be possible, but;

- Picture-in-picture: 2 channels for transmission and a dual tuner needed
- could be squeezed into the private section of TS, but 2 video players needed in STB

-> frequency resource and hardware issues

May not be suitable for some receivers.

Sign Language Translator Video Signing (4)

Alternative solutions

- Parallel delivery through Internet (Brunel, IRT, RAI – under a laboratory environment)

>> Internet Enabled TV, Connected TV

Sign Language Translator Video Signing (5)

Alternative solutions

- Parallel delivery through mobile phone network (RAI - Italy)

Sign Language Translator Video Signing (6)

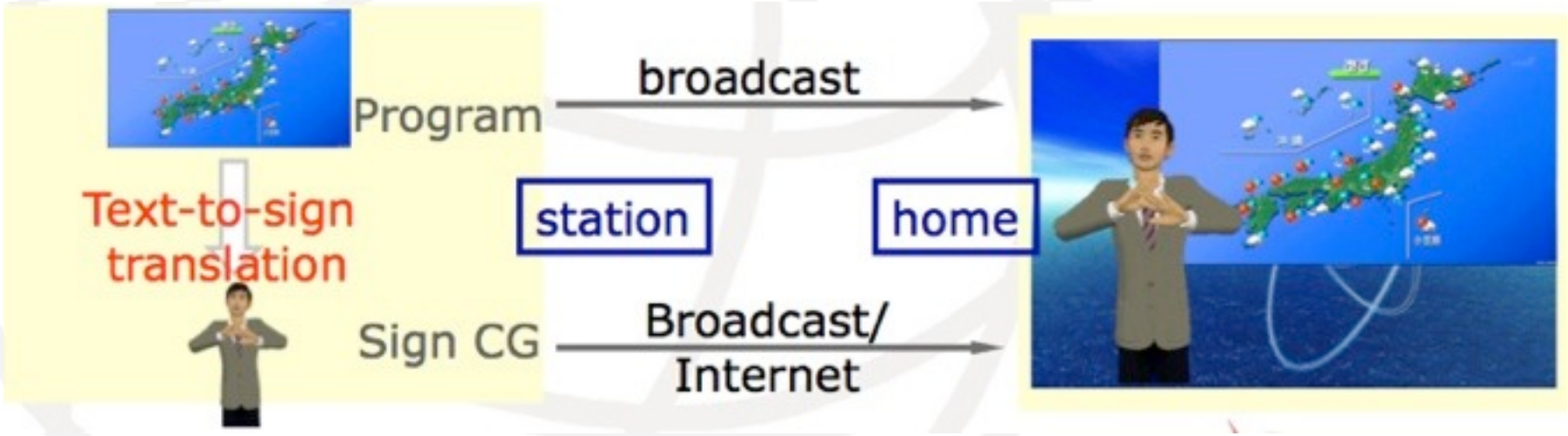
Alternative solutions

- Computer Generated Translator (RAI, Italy), also tested in several other countries

Sign Language Translator Video Signing (7)

Alternative solutions

- Computer Generated Translator (NHK STRL, Japan)



Activity 9 TV standards and regulation

- What are your conclusions?
- What points are worth noting?

Activity 9 TV standards and regulation

Instructions.

- Work in groups.
- Compare DD 

and Star TV STAR
  - How are is accessibility regulated?
  - What role do open standards play in their everyday activities (TV from source to viewer)?
  - What are the main accessibility challenges facing these two organisations?

Outcomes
What should I be able to do?

You should now be able to answer questions like these:

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Reading

- Work flows and resources (How are the access services to be produced, delivered and used?) chapter 5
  - a) Are all the various technologies available for the workflows foreseen for the accessibility action?
  - b) Are all the necessary human resources available in the territory, including trained personnel required for access service production?