A Medium to Long Term Roadmap for Access Services on DTV

Takebumi ITAGAKI, Thomas OWENS

School of Engineering and Design, Burnel University, Uxbridge, UB8 3PH, U.K
Tel: +44 1895 2 66749, Fax: + 44 1895 258728, Email: T.Itagaki@brunel.ac.uk

Abstract: DTV4All is a project partly funded by the European Commission (CIP ICT Policy Support Programme) to facilitate the provision of access services on digital television across the European Union. Access services literally help their users access the content of television programmes. Important examples of access services for people who are hard of hearing or deaf are subtitles and deaf signing provided with television programmes to allow their users to more fully appreciate the programme dialogue. The primary aim of the DTV4All project is to encourage the roll out of access services on digital television across the EC. To do this the project targets eroding the barriers to the roll out of access services by making clear what these barriers are and how they may be overcome. This paper provides an overview of the progress the project has made in its first two years in meeting this target.

1. Introduction

1.1 Project Outline

DTV4All is a project partly funded by the European Commission (CIP ICT Policy Support Programme) to facilitate the provision of access services on digital television across the European Union. Access services literally help their users access the content of television programmes. Important examples of access services for people who are hard of hearing or deaf are subtitles and deaf signing provided with television programmes to allow their users to more fully appreciate the programme dialogue.

The primary aim of the DTV4All project is to encourage the roll out of access services on digital television. To achieve its aim the project will erode barriers to the roll out of access services by making clear what these barriers are and how they may be overcome. In doing this, participants' in the entire value chain of digital television will be addressed. The project will seek to convince public broadcasters of the importance decision makers attach to access services on digital television and why. In this regard, DTV4All will provide examples of good practice in rolling out access services for social inclusion that will not be restricted to services for those with physical impairments but will include, for example, the provision of subtitles for immigrant groups. To encourage digital television receiver manufacturers to produce receivers that can present or ignore access services as required by the user, the project will provide examples of good practice in the design of respective receivers.

The switch-off of analogue television in Europe by 2012 represents both a challenge and an opportunity for access services. It represents a challenge for two very different reasons. Firstly, many people who have had no problems accessing analogue television will experience some difficulty in accessing digital television. The extent of this issue is such that approximately 15% of Europeans have difficulties in accessing digital television for reasons such as:

- Hearing impairments

- Dyslexia
- Visual impairments
- The complexity of setting up a digital receiver or set-top box
- Remote controls they find difficult to use
- Electronic Programme Guides (especially when there are over one hundred channels to choose from)

Secondly, the analogue switch-off will introduce widespread improvements to the quality of existing digital television programmes, collectively known as second generation digital television, such as high definition television (HDTV). As the amount of information that can be sent by a digital television transmitter is limited this poses a challenge to some existing access services. For example, the amount of information in a high definition television programme is significantly higher than the amount of information in the same programme delivered in standard definition. This means that there will be pressure to reduce the amount of transmitted information devoted to access services due to the demand for programmes to be delivered in high definition.

The opportunities to improve access to digital television for those with physical, mental or age-related impairments that arise due to the analogue switch-off take two forms, opportunities to extend the provision of existing mature access services to European countries that do not currently provide them, and opportunities to provide new kinds of access services known as emerging access services. To ensure the challenge is addressed and the opportunity exploited, DTV4All takes action on two fronts:

- Ensuring the widespread adoption of mature access services for first generation digital television
- Identifying, assessing and promoting emerging access services for second generation digital television

The most valuable contribution DTV4All can make is to identify the enablers that will allow a core set of access services to be offered in all EU member countries in the near future.

1.2 Project Objectives

DTV4All investigates existing methods for barrier-free television access as well as new methods. The primary goal is to assess the efficiency and effectiveness of the deployment of mature methods through comprehensive field tests in four European member states, Denmark, Germany, Italy, and Spain, in order to realize barrier-free access in day-to-day operations as soon as possible on a pan-European scale. Through the project the European Commission is thus enhancing efforts to integrate all the citizens of the European Union in the Information Society and allow them to enjoy the enhanced quality of life associated with the Information Society. The objectives of the project are:

1. Offer and evaluate mature subtitling, audio description, audio subtitling and signing services in a minimum of four territories within the European Union for at least 12 months.
2. Identify improvements to existing access services and ways of addressing the key technical, organisational and legal obstacles to the sustainable take-up of these services in the timeframe 2008-2010 throughout Europe.
3. Identify and prioritise key emerging access services, and the devices and platforms needed to support them for the period 2010-2012 in terms of technological feasibility, perceived value to their intended users and business model viability.

4. Make recommendations regarding mature and emerging access services to bodies representing stakeholders in the access service value chain on the basis of which these bodies can take appropriate action in relevant standardisation bodies.

2. Technology Description

Current Situations in EU member countries

The plan for the deployment of accessible Digital Terrestrial Television transmitters has been completed. On the transmission side:

- The Digital Video Broadcasting (DVB) standard is in use

  → DVB subtitles can be sent

- The MPEG-2 audio/video standard is in use (with some use of the MPEG-4 video standard)

  → Audio (sound only) access services can be sent on an extra audio channel (e.g. Audio Description (AD), clear audio, etc.)

  → An extra video stream (e.g. of a signer) could be sent in the private section of an MPEG-2 Transport Stream or a secondary Transport Stream on another channel could be superimposed over the main content, for this, a secondary turner and a special function on the receiver middleware might be required.

The necessary standards for the access services are available or being implemented. However, it seems that the operational issues, such as the provision of guidelines on receiver middleware, may have to be clarified, in some countries.

As long as enough radio frequency resource (spectrum) is available the access services mentioned above could be transmitted for "user mix" reception, i.e. the user can select to use or not to use the services. However, at the receiver end:

- UK and NORDIG member countries have middleware implementation guidelines and receiver compliance validation systems, i.e. The DTG's "Digital Zoo" in the UK

- Most of the other EU member countries do not have middleware implementation guidelines:

  → Receivers in these countries may not be able to present to the user unexpected additional access service content within a DVB transport stream and/or within the encapsulated MPEG-2 streams

  → Access service content may confuse the receiver resulting in a complete loss of service, undesired presentation of the service to the user and/or an incorrect presentation of the service to the user, as has already been reported in DTV4All pilot test results from RBB (Berlin, Germany)

  → The Commission needs to address the policy actions that need to be taken to remedy the above situation.

Some EU member countries, in particular Germany and France, may have decided to take another approach toward future TV, Hybrid TV with a broadband Internet connection. In these cases, no further developments are to be expected on existing broadcasting services. This is not an option for many EU member countries because of a lack of affordable broadband Internet services to the home.

3. Developments

There have been several EU directives in this field, including one for "Digital Terrestrial TV Switch on by 2012". However, the DTV4All project has identified that a pan-European approach may not be always suitable because the flow of the political power and funding for the broadcasting is at the national level.
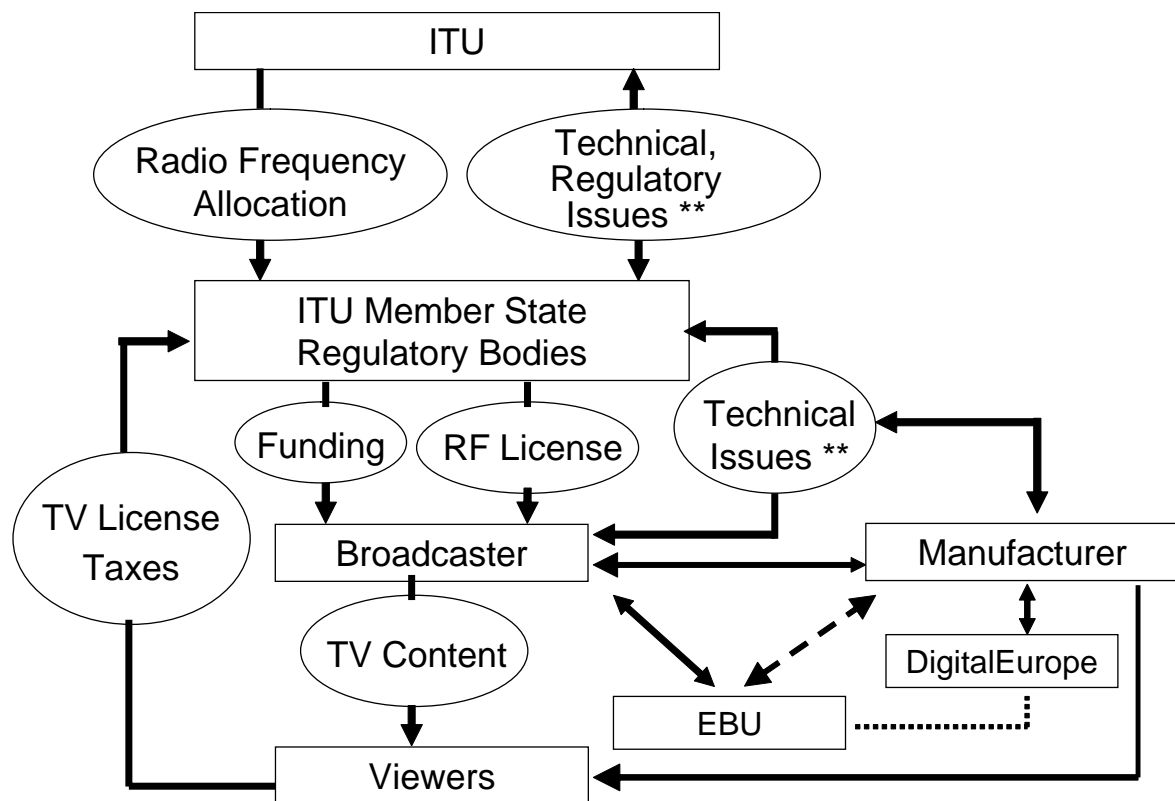

Figure 1: Flow of the political power and funding in terrestrial broadcasting

Technically, each EU member country controls own regulatory environment for terrestrial broadcasting. This state of affairs is reflected in the ITU (International Telecommunication Union) through one member one vote for each nation state. The ITU allocates the Radio Frequency Spectrum and other related resources at the global level. The manufacturers and broadcasters can be represented through a member country. The EBU (European Broadcasting Union) could co-ordinate an action among the EBU member countries, but such an action has to be initiated from the bottom up by member countries.

The DTV4All project has identified that for the roll out of access services for terrestrial television to be accelerated it is necessary to acknowledge that:

- There are two potentially conflicting local policies on the provision of access services for terrestrial television; the traditional approach of providing them by terrestrial broadcast and the Hybrid TV approach where they are provided over a broadband Internet connection

- The remit of Europe's national broadcast regulatory bodies requires:

  - A country by country approach

  - Coordination of the national regulatory bodies through EU

- A pan-European technical solution for the delivery of access services by terrestrial broadcast may not be needed as existing standards could be used with minor

changes to receiver middleware. As a result, some manufacturers choose to use a pan-European platform for their high-end integrated Digital TV with some minor modification on their middleware to reflect local differences.

4. Results

All the project deliverables of the first two years are available on the project web site [1]. In particular, objective 1 has been achieved, see D1.1: Detailed Work Plan for the full-scale Deployment of Mature Access Services, D2.1: Technical Plan of Mature Pilot Services, D2.2: Evaluation Methodology and D2.5: Final Report on Pilot Services (in two parts). Significant progress has been made towards objective 2, see D4.1: Cooperation with Standardisation bodies and D4.4: Final dissemination plan. Objective 3 has been achieved, see: D3.1: A Shortlist of Emerging Access Services. The work on objective 2 will be completed in October 2010 with the submission to the European Commission of a final report on Expert User Tests of Emerging Access Services which will be made available on the project web site. Objective 4 will be met in the last six months of the project, which ends on 31 December 2010, through public deliverables which will be made available for download from the project web site.

An overview of all the work of the project will be presented at an ITU-EBU Joint Workshop on Accessibility to Broadcasting and IPTV – ACCESS for ALL that will be held in cooperation with the DTV4All project 24-25 November 2010 ITU Headquarters in Geneva, Switzerland

5. Concluding remarks

The philosophy of approach that has emerged from the work of the DTV4All project, underpinning its advice to the European Commission (EC) in its role as a policy support project, is that there is a need for the EC to make clear that if member states do not provide unequivocal evidence that substantial progress is being made on the roll out of access services for digital terrestrial television then by a certain date then national legislation will have to be introduced to ensure that such access services are provided.

Currently, any legislation to require the provision of access services for digital television would have to be introduced at the national and not the European level for reasons that include:

- The speed of terrestrial digital TV deployment is different from country to country

- At the national level local conditions such as the availability of spectrum and of high speed broadband connections can be fully and efficiently taken into account

- Only member countries' national regulatory bodies have the power of licensing and funding as the ITU allocates frequency resource to each member country without EC involvement.

- There are no EU-wide regulatory bodies that oversee broadcasting policy. Hence, the EC may wish to consider establishing a regulatory body for terrestrial broadcasting similar to the one that oversees telecoms policy. i.e., the Body of European Regulators for Electronic Communications (BEREC).

National legislation has already had a significant positive impact on the provision of access services in, for example, United Kingdom, Demark and Spain. It is worth noting that these countries have a long-term road map for analogue to digital TV switch over that includes a technical forum for middleware/equipment and a user forum under the control of the regulatory bodies.

On 29th November 2007 the European Parliament issued the 'Audiovisual Media Services Without Frontiers' Directive which gives rights to better access to audiovisual media, including television programmes, to hearing or visually-impaired citizens. The directive identified the need for converged regulation in an environment where increasingly audiovisual media is delivered over converged networks. Article 7: Accessibility for people with disabilities states that [2]:

"Member States shall encourage media service providers under their jurisdiction to ensure that their services are gradually made accessible to people with a visual or hearing disability."

"Sight- and hearing-impaired persons as well as elderly people shall participate in the social and cultural life of the European Union. Therefore, they shall have access to audiovisual media services. Governments must encourage media companies under their jurisdiction to do this, e.g. by sign language, subtitling, audio-description or easily understandable menu navigation."

EU member states were given 24 months to move these provisions into national law so they should have applied by 2009.

As the United Nations convention on the rights of persons with disabilities came into force in 2008 such action is now essential so that all EU member states are compliant with this convention.

In addition to their widely familiar use as aids for people with sight or hearing impairments, access services are used in Europe to promote the social of inclusion of immigrant and national minority groups. For example, alternative audio channels are provided in Catalonia (Spain) and Finland which give the dialogue of popular television programmes in the languages of significant immigrant groups so that they can more readily access the content of the programmes and thus become more aware of the cultural and social issues, and the values of the society around them. The technology required to provide such services is the same as that used to provide an alternative audio channel delivering audio description to blind users. Access services can also be used to promote the social integration of minority groups. For example, having available subtitles in your native language accompanying audio visual material in a language that is foreign to you can greatly assist in your learning of the foreign language.

References

[1] http://www.psp-dtv4all.org/
[2] http://ec.europa.eu/avpolicy/reg/tvwf/access/index_en.htm