

COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME

ICT Policy Support Programme (ICT PSP)



ICT PSP call identifier: **ICT PSP/2007/1**

*ICT PSP Theme/
Objective identifier:* **3.0: Emerging Access Services**

Project acronym: **DTV4All**

Project full title: **Digital Television For All**

Grant Agreement no.: **224994**

Contract duration: **01.07.2008 – 31.12.2010**

Deliverable no.: **D3.2**

Deliverable title: **Implementation and Test Plan**

Nature of deliverable: **Report**

Dissemination level **Public**

Due date: **01.12.2008**

Actual delivery date: **20.03.2008**

| <i>Document title and history:</i> | | | |
|--|--------------|--|--------------------|
| D3.2 – Implementation and Test Plan | | | |
| <i>Version no:</i> | <i>Date:</i> | <i>Changes</i> | <i>Contributor</i> |
| 001 | 30-12-2008 | First draft distributed for discussion | All |
| 002 | 07-01-2009 | Amendments | Brunel |
| 003 | 09-01-2009 | Amendements | IRT, Brunel |
| 004 | 09-02-2009 | Contributions | RBB |
| 005 | 25-02-2009 | Re-design | RBB/IRT |
| 006 | 28-02-2009 | Information on numbers of users added | RBB |
| 007 | 28-02-2009 | Revisions to the technical content of section 7 | TVC |
| 008 | 04-03-2009 | Editorial revisions to the text | Brunel |
| 009 | 09-03-2009 | Minor corrections, revisions and additions | Red Bee, IRT |
| 010 | 11-03-2009 | Overview of laboratory tests added | IRT, |
| | | Text added on the SAVANT demonstrators | Brunel |
| 011 | 13-03-2009 | Paragraph added to section 10 | Brunel |
| | | Revision of section 5 text | IRT |
| 012 | 17-03-2009 | Information on user groups added | UAB, TVC |
| | | Final editorial check | Brunel |
| | | Clarification of receiver mix signing tests by RAI | Brunel, RAI |

| | |
|---|--|
| <i>Document authors / organization:</i> | Werner Brückner, Christoph Dosch, IRT |
| <i>Partners contributed:</i> | All |
| <i>Availability:</i> | |
| <i>Circulation:</i> | Partners |

DTV4All

D3.2 – Implementation and Test Plan

Table of Contents

| | |
|---|----|
| 1. Introduction..... | 4 |
| 2. Identified demonstrators as a precondition for test plans..... | 6 |
| 3. Enhanced Text services for the deaf and the hearing impaired..... | 7 |
| 4. Enhanced subtitling services for the deaf and the hearing impaired | 10 |
| 5. Video signing solutions | 11 |
| 6. Improved audio for the hearing impaired (Clean Audio) | 15 |
| 7. Enhanced Audio Description Services | 19 |
| 8. Reduced playback speed..... | 24 |
| 9. User Interface Aspects..... | 26 |
| 10. Recommendations on emerging services, devices and platforms | 28 |
| 11. Consequences for the process of dissemination..... | 29 |

1. Introduction

The underlying aim of all the work of the DTV4All project is to make access services more widely available on digital television. This document focuses on how DTV4All will interface with the latest technical developments to achieve this aim while ensuring the optimal usability of access services on digital television. The overall objectives of this document are to establish:

- An implementation plan for emerging access services, this means determining how the emerging services selected for implementation will be implemented
- A test plan for the emerging access services that will be implemented, this means determining when to perform dedicated tests of the implemented services and the target groups that will do the evaluation of the services
- How the results of the tests will be dealt with and the ways in which the DTV4All project team will respond to the results
- The ways in which the test results will be fed back into the process of development of a “Demonstrator”

The test plan will provide the basis for the scoping of the implementation issues that DTV4All will address. For the tests to be able to result in the development of guidelines that can support the actual implementation of emerging access services it is essential that the test plan adheres to the guidance given by the existing rules on access services established by regulators and legislators. This should not be difficult to achieve since this guidance is intended to ensure that the needs of all the stakeholders in the value chain, i.e., the viewers’ and the broadcasters, etc., are taken into account in the process of developing access services.

In addition to providing guidelines on the implementation of emerging access services, the tests have a potentially important role to play in highlighting to those who influence access services from a regulatory and legislative point of view where the existing rules on access services need to be developed further to fully accommodate the needs of stakeholders with respect to emerging access services.

This document will indicate how the DTV4All team plans to carry out tests that will promote interoperability from the start to the end of the value chain, i.e. from the production of the service to the end-user, the viewer. However, a "user needs come first" approach will be adopted through use of the results of tests of the users' experience of the services under consideration.

The most fundamental issue to be addressed in the test arena by DTV4All is that the services which are to be tested are fundamentally different from each other. This is because different kinds of digital TV user impairments will be catered for by the services under consideration. This issue is also addressed in Section 5 of the DTV4All Project deliverable 2.1, with reference to the pertinent Communication from the Commission which promotes eAccessibility, i.e., accessible information and communication technologies for people with disabilities. The primary objective of eAccessibility in the arena of digital TV is to make TV programmes more accessible for those who are visually impaired and/or hearing impaired, and for people with language impairments such as aphasia or dyslexia, or cognitive impairment such as mental retardation or decreased concentration. In a significant number of cases these impairments will be age related. The DTV4All project focuses on improving access to digital TV for people with visual, hearing, and cognitive impairments.

DTV4All project partners together provide the infrastructure and experts necessary for undertaking the tests, and are assisted by DTV4All project partners IRT, Brunel and TVC which provide the technical means necessary to realise the tests.

A good understanding of the role and significance of this report requires a clear awareness of the needs of its target audience, digital TV users with impairments. The issues under consideration in the DTV4All project are not exclusively technical but are strongly influenced by expertise gained in working with the users of TV access services.

Emerging Access services should ideally be supported by all TV media platforms, digital television, IPTV, mobile TV and open Internet platforms.

2. Identified demonstrators as a precondition for test plans

The process of identifying the emerging access services that would be tested in the DTV4All project was completed in the first six months of the project and reported in project deliverable 3.1. In this document seven main types of demonstrators are identified in relation to emerging access services:

1. Demonstrators of enhanced subtitling
2. Demonstrators of enhanced text services
3. Demonstrators for video signing
4. Demonstrators for clean audio
5. Demonstrators of enhanced audio description
6. Demonstrators of reduced playback speed
7. Demonstrators for user interfaces with text to speech

In this document text services and subtitling are treated as two different and independent types of access services that can be demonstrated separately. The decision to make this distinction was driven by the recent developments in access service provision, namely, the introduction of the Data Distribution Service (DDS) in Digital Video Broadcasting (DVB) subtitling which fulfils all the criteria set by the project for it to be considered an emerging service. Another consideration justifying the distinction made is that Consumer Electronics-HyperText Markup Language (CE-HTML) which can be used as a means for providing enhanced text services does not support subtitling. Furthermore, it is necessary in this document to subdivide these seven basic types of access service demonstrator to reflect the fact that significant variations on particular types of access services exist. This is particularly true for 'enhanced audio description'. Here three different approaches are possible. To make the complex matter of developing demonstrators more manageable phase I and phase II implementations of the demonstrators are planned. For instance, in the case of 'video signing' two approaches are under review which are dealt with in two phases, phase I (2009) and phase II (2010). In the case of 'clean audio' applications the technical means to achieve it is Digital Signal Processing, but three different test plans have to be drawn up to test it in three countries different countries because they use different languages which means that different processing is required in different localisations with different broadcasters. A complete list of the emerging access service demonstrators that will be developed in DTV4All is given in the Appendix to this document.

3. Enhanced Text services for the deaf and the hearing impaired

Background:

An issue raised by the move to high definition television (HDTV) is that the ability to generate mixed text, graphics and pictures, as for example, but not exclusively, with Multimedia and Hypermedia Experts Group (MHEG) needs revisiting. This is because, in general, a HDTV user will expect high definition graphics. Improvements relying on High-Definition TV can make subtitling and text services much more attractive, especially for people with both hearing and visual impairments. The type of presentation of access service content on a TV screen is no longer fixed by the broadcasters, but can be adapted to personal needs and preferences by the user. This could help improve the legibility for the user of existing text services like Teletext, MHEG-5 etc.

Exciting possibilities for the provision of enhanced access services are raised by the advent of hybrid Digital Video Broadcast - Terrestrial/Internet Protocol (DVB-T/IP) receivers with broadband connections and by HDTV which brings with it large screen diameters and high resolution displays. As stated in D3.1 with the introduction of HDTV many participants in the value chain are planning to replace classic Teletext technology with more recent flexible technologies for subtitling. The latest candidate to be such a Teletext successor is CE-HTML. This technique has the chance to take the place of other middleware like Multimedia Home Platform (MHP).

DTV4All will demonstrate conceivable improvements in subtitling and text services that can be realised using CE-HTML, such as user-controlled rendering options, including:

- positioning
- (re-)sizing
- font style selection
- colour palette

Thus the way the service is presented on a TV screen is no longer fixed by the broadcaster but can be adapted to personal needs and preferences of the user by the user. This could help improve the legibility for the user of text services currently provided using Teletext, MHEG-5, etc. Together with techniques like “spoken interfaces” 2nd generation text services are ideal candidates for the provision of future access services on DTV.

Implementation Plan for enhanced text services:

Aim

To set up a digital mock-up of a second generation digital TV-text service that can be decoded and represented by HDTV receivers that support HTML/Extensible Markup Language (XML) using CE-HTML. Delivery of the content is either based on IP and/or High Frequency (HF)-delivery. Delivery is provided with the help of a Moving Picture Experts Group (MPEG)-II Transport Stream containing additional data of relevance to access services.

Short description of the service

An improved CE-HTML service with the ability to display mixed text, graphics and pictures. Multimedia content tailored for the needs of access services, but not exclusively.

Required items (hardware, software and test material)

A CE-HTML hybrid box, test pages with relevance for access services, software.

Partners involved

IRT, RBB

Tests required

IRT will provide a test implementation of a new type of ancillary service tailored for high definition screens. RBB will contribute test material and will undertake laboratory user tests.

Time plan

Demonstration Material should be available in month 12 of the project according to its Description of Work.

Duration of tests

The tests will last for a maximum of 4 weeks

Location of tests

In RBB's case the laboratory tests will take place onsite at RBB.

Purpose of the tests

For hearing impaired and deaf users using text services extensively any improvements in legibility are useful to them. For visually impaired viewers with significant myopia adjustable sizing of text might be useful.

Numbers of participants

As for its field test of mature services, RBB will cooperate with the respective disability associations in the Berlin-Brandenburg region. Approximately 5-10 users will be invited to participate in the tests onsite at RBB.

Test Plan for Enhanced Text Services Phase I:

| | | | | | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----|------------|----|-----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | IRT | IRT | IBC | | RBB | | |

Preparation of material: RBB+IRT months 1-6

Processing of material: IRT months 7 and 8

Laboratory tests with test persons: the ensuing evaluation will be done by RBB with the assistance of UAB in month 11

Test Plan for Enhanced Text Services Phase II:

| | | | | | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----|------------|----|----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 |
| RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | RBB +IRT | IRT | IRT | IBC | | | | |

The final implementation by DTV4All of enhanced text services will be exhibited at the International Broadcast Conference 2010 (IBC), Amsterdam

4. Enhanced subtitling services for the deaf and the hearing impaired

Background:

DTV4All intends to demonstrate how DVB subtitling and its identified variants could be used with HDTV. As DVB subtitles are designed for standard definition television (SDTV), further improvements in legibility and presentation for sight impaired viewers are feasible with the introduction of HDTV. The BBC has developed high definition (HD) extensions to DVB subtitling (ETS 300-743 v1.3.1). The BBC has reported that DVB subtitles (with DDS) are already being delivered with the BBC's HD service on satellite and will be the means of delivering subtitles for HD services on UK Digital Terrestrial Television (DVB-T2) when these services are launched in late 2009 or early 2010. Red Bee Media will work with the BBC to arrange for the BBC HD subtitled programming to be made available. If this footage is available in time for demonstrating at IBC 2010 then the DTV4All project will arrange for this to be done.

Demonstration Plan:

Service Name

High Definition Subtitling based on EN300743v1.3.1

Short description of the service

An improved subtitling service with extensions to address HD screens with content tailored for the needs of access services, but not exclusively.

Required items (hardware, software and footage)

Set-top Boxes (receivers for DVB-T2) with extensions that allow them to display content delivered according to EN300743v1.3.1 with DDS

Partners involved

RedBee

Schedules

The launch of DVB-T2 in the UK has to be awaited.

Location of demonstration

The demonstration is planned to take place at IBC 2010 will take in Amsterdam.

5. Video signing solutions

Background:

DTV4All has identified a need for receiver mix signing for the deaf similar to the well-known open caption subtitling services. An open signing service allows the user to switch the signer on and off. In DTV4All the video of the signer will be transmitted with the help of a bidirectional IP network at a lower data rate than the programme itself because of the video frames of the signer are smaller in size than those of the programme being signed. The reason for using an IP network to deliver the signer video rather than broadcasting it simultaneously with the programme is that the move to HDTV is placing constraints on the amount of spectrum that can be used to broadcast access services. One option to dealing with this constraint is to move the delivery of the access service to an IP network and synchronize the play-out of the signer video with the programme being signed. The optimal size of the video of the signer from the user's point of view, on the screen displaying the signed programme, still needs to be determined.

The demonstrator that will be used to test this service is based on the results of the SAVANT project and uses the general architecture of the Multi Media Home Platform (MHP) middleware and software developed in the SAVANT project. The end-user reception of the service requires a hybrid broadcast and broadband set-top box with modified software modules (providing a return channel over the Internet, synchronisation of the signer video with the programme, simultaneous decoding of the two video streams, etc.). In some markets it is expected that CE-HTML will replace MHP as a middleware platform for digital television receivers. For this reason two phases are foreseen for the testing of this service:

Phase I will rely on the successfully proven SAVANT technology running on an MHP middleware platform which is in the process of being phased out.

Phase II will make use of hybrid devices which are broadcast receivers but also connected to the Internet using a CE-HTML browser. An application designed for the CE-HTML environment combines the broadcast video together with a video stream containing the signer delivered via an Internet connection. The second phase demonstrator will support HDTV. CE-HTML capable platforms are expected to be available in 2010.

The use of CE-HTML should allow for an all-in-one solution which allows both HD-Text services and open signing services to be available. Furthermore, CE-HTML has the potential to become a universal middleware for all access services in the future.

Implementation Plan:

Service Name

A demonstrator for open video signing solutions

Short description of the service

DTV4All will demonstrate in a first phase a hybrid broadcast/broadband approach to delivery the service, where the signer video is transmitted synchronously with the broadcast of the programme being signed via a separate broadband Internet connection. DTV4All will demonstrate in a second phase a broadband/broadband approach, where the signer video is transmitted synchronously with the transmission of the programme being signed over the Internet via a separate Internet link.

Required items (hardware, software and test material)

Server PC including:

- SAVANT scheduler software, streaming software including SAVANT extensions
- DVB- repository with 2 kinds of footage, a signer video and the news being signed (in the German language), and a TV-Anytime based service description
- Digital Video Broadcasting - Asynchronous Serial Interface (DVB-ASI) playout card and Quadrature Phase Shift Keying (QPSK) modulator (Digital Video Broadcasting – Satellite (DVB-S))
- Alternatively a QPSK modulator as a Peripheral Component Interconnect (PCI) board (e.g. Dektec DTA 107)

Local Area Network access to an IP-connection

Phase I Client including

- PC with DVB-S receiver board
- Extended DVB-MHP software enabled for synchronized video playback.

Phase II Client including

- Hybrid DVB-S/Digital Subscriber Line (DSL) receiver with CE-HTML browser (simultaneous decoding of the two video streams etc., optional synchronisation of the signer and the programme)

Partners

IRT, RAI, RBB, Brunel

Tests required

Acceptance laboratory tests carried out with a user group and with the help of RBB and Brunel. RAI has provided a video stream in the Italian language together with an accompanying video signing the programme from which IRT will create a transport stream and associated IP streams for the SAVANT system.

Time schedule

A first prototype based on the SAVANT solution is already available but will be improved upon until IBC 2009. A phase II solution using CE-HTML and supporting HDTV is under construction and is expected to be ready in 2010.

Location of tests

In RBB’s case the laboratory tests will take place on site at RBB Brunel will duplicate the SAVANT demonstrator system developed at IRT and loan their SAVANT demonstrator to RAI so that RAI may do laboratory tests on the system on site at RAI.

Type of tests (subjective/objective), expert/non-expert viewers

RBB plans subjective and objective tests with non-expert viewers from the respective end user target groups. Approximately 5-10 users will be invited to participate in the tests onsite at RBB (Phase II).

Brunel will pass its demonstrator to RAI after IBC 2009. RAI plans subjective tests with 5 - 8 signing deaf people.

Test Plan: Demonstrator for Video Signing solutions

Phase I in 2009

| | | | | | | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------------|---------------|---------------|---------------|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| IRT RBB Brunel | IBC | RAI Brunel | RAI Brunel | RAI Brunel | |

An implementation by DTV4All of open video signing delivered using a hybrid broadcast/broadband solution was demonstrated at the European Ministerial e-Inclusion Conference 2008 in Vienna. This lets users change the position of the signer on the TV screen and the dimensions of the signer. In the next step users will be asked if they notice any difference between broadcaster mix signer and receiver mix (IP delivered) signing when there is no change in the buffer size. It is anticipated that broadcaster mix and receiver mix signing will be exhibited side by side at the International Broadcast Conference 2009 (IBC), Amsterdam. It is hoped that in the IBC 2009 demonstration the User Interface will include a talking EPG demonstrated using a commercial Set Top Box sold in German market.

Phase II in 2010

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 |
|--------|--------|--------|--------|--------|--------|--------|--------|------------|--------|--------|----|------|
| IRT | IBC | IRT | IRT | | |
| RBB | | RBB | RBB | | |
| Brunel | | Brunel | Brunel | | |

The final implementation by DTV4All of open video signing will be exhibited at the Exhibition / International Broadcast Conference 2010 (IBC), Amsterdam.

6. Improved audio for the hearing impaired (Clean Audio)

Background:

Many hard of hearing people find speech on TV difficult to follow. This is often caused by distracting background sound sources such as sound effects, ambient noise or music. Introducing an additional audio channel focussed only on dialogue and narrative speech might help to improve the intelligibility of dialogue for users with hearing impairments and could complement or in some cases even substitute the use of subtitles. This approach, usually called “Clean Audio” or also “Dialogue Only”, means that the dialogue is delivered without any other significant audio components in an extra audio channel that is created on the broadcaster side as specified in the DVB MPEG standard. The standard allows several audio tracks to be assigned to a MPEG video/audio stream. DTV4All will not consider the delivery of Clean Audio content over IP networks.

Very often the centre channel of a 5.1 channel stereo recording can be used to provide clean audio as it often carries the dialogue part of a movie. This offers most of the information needed by hard-of-hearing people, but not all, as even movies sometimes deliver dialogue off-picture placing it on any of the 5 channels. Therefore, it is necessary to provide an extra clean channel even 5.1 channel stereo recordings.

Often it is necessary to "clean" dialogue parts to provide clean audio as they are mixed with ambience noise or music. In the case of older stored assets the single tracks of the recording when speech, sound effects and music were separately available are not retained all that is available is a recording of the received broadcast.

Today, Clean Audio services of both types are not yet offered to the end user. However, there is suitable technology available for the automatic production of an extra audio channel on the broadcast side. IRT will consider both deriving a Clean Audio signal from existing archived mixed mono or stereo material and automatic re-processing of existing multi-channel material in order to generate a clearer spatial representation to emphasise the speech. For both scenarios existing technological solutions will be analysed for their suitability and the results of the analysis will be presented.

Clean Audio is an emerging access service that is of use a large potential user group despite the extreme heterogeneity of hearing disabilities. IRT will work with ‘average parameters’. Thus, clean audio cannot be used as a substitute for a hearing aid. Clean audio is a service that could be of help to people with slight or medium hearing impairment.

Implementation Plan “Demonstrator for Clean Audio”

Aim of the service

To improve the intelligibility of dialogue for users with hearing impairments

Required items (hardware, software and test material)

Audio Processor CEDAR 1500 (or follow-up)

Standard DVB receiver set

RBB needs for its work a standard DVB receiver and an audio processing module

Partners involved

IRT, UAB, RBB

Partners contributions to the tests

UAB will undertake trials with volunteers in the Catalan and/or Spanish languages and in the German language, respectively.

IRT will cooperate closely with TVC and RBB; both broadcasters will provide video material for test purposes.

RBB will test IRT’s solution with hearing impaired users, first in limited laboratory tests in order to assist the different stages of development, later on a larger scale. The idea is to involve RBB’s existing user group encompassing about 25 deaf and 25 hard-of-hearing users who are currently participating in RBB’s field test of DVB-subtitles. RBB will try to involve the 25 hard of hearing users in the Clean Audio tests in the autumn of 2009. It will have to be examined, however, whether the different levels of hearing impairment in this heterogeneous group are appropriate for the user testing of clean audio services. Technical equipment for the laboratory tests will be provided by IRT

Type of test (subjective/objective), expert/non-expert viewers

Laboratory tests, being subjective tests with a small group of non-experts

Location of tests

RBB, UAB

Target group(s)

Hard-of-hearing people selected out of the test group already doing subtitle evaluation

Test conditions

Home-test (DVD), laboratory test

Evaluation of the test(s)

IRT, UAB, RBB

Schedule

The first prototype should be available in month 8 of 2009.

Duration of tests

4 weeks in November 2009

Note: The Phase I Demonstrator was established at IRT and displayed at the e-inclusion event Vienna in December 2008

Test Plan “Demonstrator for Clean Audio”

Phase II Demonstrator of Clean Audio in the German language in 2009

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|------------|----|-----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| RBB | RBB | RBB | RBB | RBB | RBB | IRT | IRT | IBC | | RBB | | |

An intermediate version of clean audio in the German language will be implemented by DTV4All and exhibited at the International Broadcast Conference 2009 (IBC), Amsterdam

Preparation of material by RBB in months 1-6

Processing of material by IRT in months 7 and 8

Laboratory tests and user evaluation with the support of UAB by RBB in month 11

In the RBB laboratory tests of clean audio more than 20 users will be involved.

Phase II Demonstrator of Clean Audio in the Italian language in 2009

| | | | | | | | | | | | | |
|---|---|---|---|---|---|-----|-----|------------|----|----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| | | | | | | IRT | IRT | IBC | | | | |

An intermediate version of clean audio in the Italian language will be implemented by DTV4All and exhibited at the International Broadcast Conference 2010 (IBC), Amsterdam

Processing of material by IRT in months 7 and 8

Phase II Demonstrator of Clean Audio in the Spanish language in 2009

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|------------|----|-----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| TVC | TVC | TVC | TVC | TVC | TVC | IRT | IRT | IBC | | UAB | | |

An intermediate version of clean audio in the Spanish language will be implemented by DTV4All and exhibited at the International Broadcast Conference 2009 (IBC), Amsterdam

Preparation of material by TVC in months 1-6

Processing of material by IRT in months 7 and 8

Laboratory tests with test group and evaluation by UAB in month 11

7. Enhanced Audio Description Services

Background:

Audio Description (AD) is an additional audio track with narration for blind and visually impaired people. The service can present variations depending on the type of mix of the basic soundtracks with the additional descriptive track (broadcast-mix, user mix), or the channel used for AD (broadcast-broadcast or broadcast-broadband, for example). Because the AD audio track is delivered using technologies that are not currently used for this purpose, it is regarded as an emerging access service.

Three different approaches will be under test:

- Audio Description over a DVB-IP TV channel (AD-IPTV)
- Audio Description of video on demand (AD over VoD)
- Audio Description of web page videos (AD over the web)

TVC will implement and demonstrate three different emerging Audio Description services as described above. The tests will include technical evaluations and expert evaluations of working demonstrators. As three different services will be addressed, three demonstrators are necessary. Recommendations will be prepared on how to bring the services and their related workflows towards a mature level. The tests will be carried out in the Catalan and/or Spanish languages.

The three demonstrators that will be provided will allow the decoding of videos by means of an IP set-top box for presentation on a TV set to be tested, and diverse platforms for the delivery of the AD of VoD services to be evaluated. In particular, videos will be downloaded to identify operational problems for AD and their possible solutions. At the end, one of the three demonstrators will be selected for incorporation into the final prototype to be developed by DTV4All. Demonstrators will be provided that will show the impact of routing, allow for the checking of operational problems, especially those related to usability, and the impact on usability of using different TV-IP receivers.

Implementation Plan for AD Demonstrator 1:

Service Name

AD over DVB-IP

Short description of the service

A DVB TV channel with AD is delivered through an IP connection. This solution is fully IP-based and will show the workflow of the AD service.

Required items

- -DVB-IP TV playout
- -Video play-out
- -AD play-out
- -Codification to H264 in SD
- -Creation of the DVB-IP stream multiplex
- -A DVB Flow server to insert signalling and data services
- -A gateway
- -A broad band IP network
- -DVB-IP TV receivers
- TV footage in the Catalan and/or Spanish languages.
- Packaged files of Audio Description pieces plus time code and level metadata

Partners involved

TVC, UAB

Tests required

The tests to be carried out with the help of UAB are an acceptance test with a group of test persons with visual impairments once the test environment is available.

A control group of five people will be involved in the tests directly by UAB. The tests will be devised jointly by UAB and TVC. The tests will be sent to blind associations that will get in contact with their members. In this way an ‘open’ user group will also be involved in the tests. TVC and UAB jointly will gather and analyse resulting data. It is expected that the data will come from more than 30 users.

Test Plan for AD Demonstrator 1:

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-------------------|-----|-----|-----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| TVC | TVC <i>IBC</i> | UAB | UAB | UAB | UAB |

The second demonstration of AD will be demonstrated at IBC 2010.

Service Name

AD of VoD

Short description of the service

For a Video on Demand service where some of the videos offered have Audio Description elements associated with them (probably created primarily for DTT), a crucial question is whether or not an audio description service can be provided over this platform. Reception of AD-VoD on a PC will also be tested.

Variants of the demonstrations:

- 1- Reception of TV programs accompanied of the optional AD services packaged in a DVB-IP stream coming from a server and received on an IP-TV receiver
- 2- Reception of the VoD streams and presentation on a PC computer

Required items

On the transmitter side:

- -A DVB – IP Multiplex stream codifier
- -DVB-IP TV play-out:
 - -Video play-out
 - -AD play-out
 - -Codification to H264 in Standard Definition
 - -Generation of the DVB-IP stream multiplex
 - -A DVB Flow server to insert signalling and data services
- VoD Server with software capable of handling PHP or RTS script files expected to be required for VoD pulling
 - -A gateway
- Footage in the Catalan and/or Spanish languages.
- Packaged files of Audio Description pieces plus time code and level metadata

On the receiver side:

- -A DVB-IP TV receiver with an internet browser
- -Remote control
- -connection to a TCP-IP local network

Partners involved

TVC, UAB

Tests required

The tests to be carried out with the help of UAB are an acceptance test with a group of test persons with visual impairments once the test environment is available.

A control group of five people will be involved in the tests directly by UAB. The tests will be devised jointly by UAB and TVC. The tests will be sent to blind associations that will get in contact with their members. In this way an ‘open’ user group will also be involved in the tests. TVC and UAB jointly will gather and analyse resulting data. It is expected that the data will come from more than 30 users.

Test Plan for AD Demonstrator 2:

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|------------|-----|-----|-----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 |
| TVC | IBC | UAB | UAB | UAB | UAB |

Implementation Plan for Demonstrator 3 of AD:

Service Name

AD over the Web

Short description of the service

The possibilities for providing optional AD accessibility services with videos delivered via the Internet will be explored. AD to accompany videos streamed using proprietary technologies such as Flash, Windows Media, and Real Video will be investigated

Required items

Required on the transmitter side:

- a server capable of handling PHP scripts plus adapted software for interaction with users, any TVC server could be used
- an IP connection

On the receiver side:

A standard PC with a browser and an Internet connection

Tests required

The tests to be carried out by TVC with the help of UAB are an acceptance test with a group of test persons with visual impairments

A control group of five people will be involved in the tests directly by UAB. The tests will be devised jointly by UAB and TVC. The tests will be sent to blind associations that will get in contact with their members. In this way an ‘open’ user group will also be involved in the tests. TVC and UAB jointly will gather and analyse resulting data. It is expected that the data will come from more than 30 users.

Test Plan for AD Demonstrator 3:

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|------------|-----|-----|-----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 |
| TVC | IBC | UAB | UAB | UAB | UAB |

8. Reduced playback speed

Background:

Dyslexics and some people with cognitive impairments could benefit from receiver sets that allow the playing speed of the video/audio content of a programme to be reduced. To realise this, storage media must be available on the receiver e.g. a by means of a hard disk. Two methods of reducing playback speed are considered: uniform slowdown and adaptive speed depending on the content/scene. Only one method will be chosen by the project for a prototype demonstrator at the end of month 8 of the project.

Implementation Plan:

- a) To set up a digital mock-up of a test environment for uniform slowdown. DTV4All will demonstrate this functionality to increase awareness and acceptance of the provision of a reduced playback speed facility.
- b) To set up a digital mock-up of a test environment for adaptive playback speed.
- c) A different approach to those above is to slow down the programme audio to make conversations easier to understand while not extending the overall duration of the TV programme. The audio segments of dialogue are stretched (including pitch correction) while those segments without dialogue are compressed. This requires the modified sound to be prepared by the broadcaster which then transmits the modified sound on a second sound channel. To maintain synchronicity, it will be necessary to adapt the video speed accordingly.

Note: It is uncertain whether b) can be implemented in the course of the DTV4All project. Extensive tests are expected to be necessary before a service of the type described in b) above can be provided. DTV4All will demonstrate the concept.

Implementation Plan for Reduced Playback Speed:

Service Name

Reduced playback speed

Required items

Storage media must be available on the receiver e.g. a hard disk. Two methods of reducing playback speed are considered.

Partners involved

In the first instance, IRT will determine the appropriate speed of slowing down using free software called “ScaleTempo” (<http://sourceforge.net/projects/scaletempo/>), with the help of the German user groups. In a later stage, Brunel will generate higher quality audio/video material with a sound stretch based its own implementation, using speed reduction information obtained from the initial tests in Germany. Brunel will provide the demonstration materials in the German and English languages. RBB and Red Bee will provide the source content in German and English.

UAB will arrange expert tests in the Catalan and/or Spanish languages. Technical equipment will be provided by TVC and/or IRT.

A control group of 20 people comprised of five deaf oralists, five signing deaf, five hard-of-hearing, and five people with unimpaired hearing, will be involved in the tests directly by UAB. The tests will be devised jointly by UAB and TVC. The tests will be sent to deaf associations which will get in contact with their members. In this way an ‘open’ group will also participate in the tests. TVC and UAB jointly will gather and analyse resulting data. It is expected that the data will come from over 30 users.

Brunel will implement, demonstrate and test solutions for slow playback and a time stretching mechanism in the Italian language and for other contents if requested.

RAI will provide demonstration material (mainly in the Italian language)

Test Plan for Reduced Playback Speed

| | | | | | | | | | | | | |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-----|----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 |
| IRT& RAI& Brunel | IRT& Brunel | IBC | UAB | | | |

The final implementation by DTV4All of reduced playback speed will be exhibited at the International Broadcast Conference 2010 (IBC), Amsterdam.

9. User Interface Aspects

Background:

The user interface is the aggregate of the means by which the user interacts with their digital receiver. The user interface provides the means to give inputs to the receivers which influence what is output by the TV set. The design of the user interface affects the amount of effort the user must expend to provide inputs to the system and to interpret outputs of the system. The key words associated with user interface design are usability, psychology, physiology of the users, and ergonomics. The DTV4All project will focus on how spoken interfaces are applicable for the use in the world of digital television in terms of access services. A second focus will be set on how much the impaired users will accept these techniques and find them useful. In a later stage of the project further cooperation with the Consumer Electronics industry has to be established (see deliverable 4.1).

Audio User Interfaces (AUI) will convert text to speech for the visually impaired with the help of the so-called “Ammec” which means ‘Accessible Multi Media Entertainment Center’. This equipment is a PC provided with a TV receiver card, either for DVB-S, T or Cable. All menus will be read to the user, so that sight impaired and even blind people can easily navigate and access the services. This rig is available at the moment in the German language only. For that reason the tests of it will be carried out only at RBB with German speaking user groups. By the end of 2009 the Ammec will be available in an English language version allowing the project to set up further demonstrators in the English language.

Implementation Plan:

Service Name

Text to Speech

Short description of the service

An “Audio User Interface” (AUI) will be provided with the help of a text-to-speech engine. Implementations will be shown that provide an audio electronic program guide (“speaking EPG”). Additionally implementations in TV receiver sets allowing Teletext to be converted into spoken words might be provided.

Required items

An “Ammec” receiver set provided with a DVB-S receiver card. IRT will provide hardware and software

Partners involved

IRT, RBB

Target group(s)

Fully blind people and people with severe sight impairments

Type of test (subjective/objective), expert/non-expert viewers

Non-expert viewers will be used for the test. The aim is to find out how spoken interfaces are applicable for the use in the world of digital television in terms of access services
Like in the other RBB laboratory tests approximately 5-10 users will be involved.

Location of tests

The laboratory tests will take place onsite at RBB, Potsdam, in June 2009.

Evaluation of the test(s)

A questionnaire for the users involved in the test will be created in German language and will be translated. Like in the other RBB laboratory tests, UAB will evaluate RBB’s methodology and assist in interpreting and evaluating the results of the lab tests.

Test Plan for User Interfaces

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|------------|-----|-----|------------|----|----|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2009 |
| IRT | IRT | IRT | IRT | IRT | IRT RBB | IRT | IRT | IBC | | | | |

Note: Two of the Ammec receiver sets will be applied. One set is provided with software able to communicate in the English language the other set will be used for laboratory tests in Germany in the German language.

10. Recommendations on emerging services, devices and platforms

The consortium will use the performed tests to implement proof-of-concept solutions of the selected emerging services. Results will be discussed between the partners and other stakeholders. The implications for necessary adaptations of workflows will be considered. A final document at the end of the period of field tests will make the results transparent in order to provide recommendations for emerging services and guidelines for devices and platforms for second-generation digital television. In this way diffusion will be supported and new access services can become widespread and sustainable. The report will identify and prioritise key emerging access services, and the devices and platforms needed to support them for the period 2010-2012 that are technologically feasible, that have perceived value to their intended users, and for which there is a viable business model. This report will provide the justification for recommendations that will be made regarding mature and emerging access services to EICTA, EBU, NEM and other bodies representing stakeholders in the access service value chain on the basis of which these bodies can take appropriate action in relevant standardisation bodies and consultation fora.

It is important to emphasise that positive feedback on an emerging service from its test user group will not guarantee that the project will promote its roll out. The implications of providing a new access service have to be understood for the whole of the value chain in terms of its potential technical, organisational, and financial impact. This means that user feedback is gathered on a more modest scale than for the pilots of mature access services where the impact of their delivery is well understood. The project fully appreciates and will deliver on its responsibility to manage user expectations with respect to emerging access services. The user feedback that will be gathered on emerging access services will at its most basic level establish that there is a real demand for the service from its potential users.

11. Consequences for the process of dissemination

From the start of DTV4All it was desirable to cultivate contacts with the consumer electronics industry and to convince the stakeholders to support the project. Support could be offered in many ways, e.g. by providing the partners with hardware, software, and by supporting them with dissemination matters. The exchange of information between, broadcasters, users and consumer electronics manufacturers is essential to tackle incompatibility issues. This should happen as early as possible, i.e., during the prototype phases of the demonstrators of emerging access services.

The point of view of the DTV4All partners is that the technical aspects of DTV4All are not new but rather well known to the relevant experts and many broadcasters, the EBU included. However, the general public is not aware of the technical aspects of the work of DTV4All and, more importantly, to some extent neither are the consumer electronics manufacturers and parts of the European Commission. To overcome this lack of awareness, dissemination of these issues by DTV4All is essential in this project and perhaps of primary importance for the success of the project. Experience with former projects shows that access services are under the observation of the media and arouse public interest.

Appendix

Complete list of demonstrators “emerging services” for IBC 2009 and 2010

| | |
|--|---|
| TV set with CE-HMTL extensions for 2 nd Generation Text (HD-Text Demonstrator) | For sight impaired viewers suffering from severe myopia and also for hearing impaired users who use text services extensively |
| “Amtec” TV set text-2-speech Demonstrator | For blind people and people with severe sight impairments |
| Clean Sound Demonstrator | For hearing impaired people |
| SAVANT Open Signer Demonstrator | For deaf and very hard of hearing people who are able to understand sign language |
| Reduced Playback Speed Demonstrator | For people with cognitive impairments, decreased concentration and mental retardation |
| 3 Demonstrators (A,B,C) for Audio Description | For blind people and people with severe sight impairments |
| Demonstrator for subtitles based on DVB subtitling EN300743v1.3.1 after the launch of DVB-T2 in the UK in early 2010 | For hearing impaired people |

Participation Plan (preliminary)

| | IBC 2009 | IBC 2010 |
|--|-----------------|-----------------|
| Demonstrators of enhanced subtitling 300743v1.3.1 | | X |
| Demonstrators of enhanced text services | | X |
| Demonstrators of open signing | X (phase 1) | X (phase 2) |
| Demonstrators of clean audio | X | |
| Demonstrators of enhanced audio description | | X |
| Demonstrators of reduced playback speed | | X |
| Demonstrators of user interfaces with text to speech | X | |

Note: The IBC 2009 exhibition will take place at the RAI Amsterdam on 11-15 September 2009.

Overview: Laboratory Tests

| Item # | | RAI | RBB | UAB |
|---------------|------------------------------|------------|------------|--------------------------|
| 1 | Enhanced Text Services | | 11/2009 | |
| 2 | Enhanced Subtitling Services | | | |
| 3 | Video Signing Solutions | 10/2010 | 10/2010 | |
| 4 | Clean Audio | | 11/2009 | 9/2009 |
| 5 | Audio Description | | | 10-12/2009 10-12/2010 |
| 6 | Reduced Playback Speed | | | 10/2010 |
| 7 | User Interface Aspects | | 6/2009 | |

Note:

RAI will be provided with footage in the Italian language

RBB will be provided with footage in the German language

UAB will be provided with footage in the Spanish or the Catalan language