

COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME

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1 Evaluation of the Pilot of Mature Services - Introduction

The planning of the Pilot of Mature Access Services to be carried out as part of the DTV4All project has two components:

- D2.1 A technical plan including the implementation of any minor additions or changes to existing services available in 2009 in Berlin-Brandenburg, Catalonia, Denmark and Italy
- D2.2 Evaluation methodologies to be used in connection with the Pilot of Mature Access Services

The plans for the pilot of mature access services address a number of issues central to the design, production and use of:

- Subtitling for the Deaf and Hard of Hearing (SDH)
- Audio Description (AD)
- Audio Subtitling (AS)

The main metric for the Pilot of Mature Services is that it should generate inputs to dissemination documents and activities that can accelerate the take-up of mature access services across Europe.

DTV4All project deliverable D1.1 has clarified the scope of the pilot and has been used to prepare this document D2.2 Evaluation methodology which addresses the evaluation methodologies to be used to evaluate the piloted services.

This document specifies the data required to be generated not only in connection with end-user evaluations but also from interviews and other contacts with stakeholders in the supply chain for each and every mature access service in the countries participating in the Pilot. It is structured as follows: Section 2 describes the additions and amendments to the original description of work for the project agreed with the European Commission. Section 3 describes the evaluation activities that have been identified as being necessary to carry out in the pilot. Section 4 describes laboratory tests that will be carried out by academics in support of the evaluation of the pilot. Section 5 describes the field trials that will be carried out by broadcaster partners in the DTV4All project and how they will be evaluated by the broadcasters concerned. Section 6 provides some concluding remarks. Appendix 1 summarises access problems, their causes, solutions and the technical options for providing these solutions. Appendix 2 provides a brief introduction to access services not included in the original description of the work of the project.

2 Amendments and Additions to the Description of Work

- *E-inclusiveness*. The assistive technologies covered in the description of work of the project focus on those with visual and/or hearing impairments. DTV4All project deliverable D1.1 documents that there are other access problems for which there are access services available that are not included in the description of work. These do not need to be added to the project activities, but will be addressed in section 3 of this document.
- *Audio description*. No mention is made in the description of work of the project of evaluation activities in Denmark for Audio Description which has been given a soft launch in Denmark. This has been added to the pilot activities to be carried out by DR along with details of audio description evaluation activities to be conducted by DR.
- *Audio Subtitling*. Some delivery mechanisms for this service are not regarded as mature in the sense that the receiver technologies required are only available in one or two member states. It is recommended that the activities in proposed in the description of work of the project be carried out as planned, and be supplemented by Proof of Concept activities on Audio Subtitling in WP3 (Emerging Services) of the DTV4All project.
- *Visual Signing*. This is a mature access service but is not included in the description of work of the project. DTV4All project deliverable D1.1 identifies a number of issues to do with “Open” or “In Vision” visual signing involving scalability of existing solutions and their acceptability to prime-time audiences in some member states. These do not need to be added to the description of work activities, but will be addressed in section 3 (identification of issues) of this document and in WP3 (Proof of Concept for emerging solutions) of the DTV4All project.

3 Evaluation Activities required in the Pilot

As was mentioned in D1.1, DTV4All needs to identify the kinds of information that will help the project to answer the following question: *Who needs to know what in order to be able to plan, produce, deliver, promote and successfully use mature access services by 2010?*

3.1 Who are the recipients of e-inclusiveness and what are their needs?

This question focuses on the users of mature access services and the kinds of problems that need to be addressed for digital television to be inclusive.

For Berlin-Brandenburg, Catalonia, Denmark and Italy, the following information will be needed:

The demand side of e-inclusiveness

- A. The current demographics of those who have difficulties accessing digital television using the categories or problems listed in section 4.1.4 of D1.1. (also included here as Appendix 1).
- B. Forecasts for access in the coming 5-10 years (the demographic trends)

The work of the DTV4All project on this front has been facilitated by research done by John Clarkson & Simeon Keates at the University of Cambridge for the UK Digital Switchover¹ and inputs from Simeon Keates who currently works at the IT University of Copenhagen.

A number of access problems have been listed and UK data from Grundy et al. (1999)² available online has been used to make some rough estimates of the number of people who could be excluded from accessing digital television.

A summary of the estimates based on the representative UK sample of 7,3000 adults (aged 16+) is included in Table 2.

Simeon Keates reports that a comparable study to Grundy (1999) was conducted in the USA using a broadly comparable battery of questions. The overall proportion of the adult population with one or more disabilities was only 2 percentage points higher than the UK.

The suggestion made by Keates was as follows: Given the relatively small difference between the UK and the USA, and assuming that the differences between the UK and much of Europe are likely to be of the same order of magnitude or less, the UK figures can be used as an indicator of the proportion of Europeans with the disability or disabilities in question.

¹ John Clarkson & Simeon Keates (2003) Digital Television For All. A Report On Usability And Accessible Design Appendix E – Investigating The Inclusivity Of Digital Television Set-Top Box Receivers. DTI, UK. 18 September 2003.

² Grundy, E, Ahlberg D, Ali M, Breeze E, Sloggett A (1999). Disability in Great Britain: results from the 1996/97 Disability Follow-up to the Family Resources Survey, Charlesworth Group, Huddersfield, UK.

Access issues with digital television	estimate (% of population)
1. Finds it difficult/impossible to hear the audio of TV programmes	1,8%
2. Finds it difficult/impossible to hear/understand speech in mother tongue	2,3%
3. Sometimes finds it difficult to hear/understand speech in mother tongue	2,3%
4. Finds it difficult/impossible to understand speech in a foreign language	No figures
5. Finds it difficult/impossible to see the visual component of a TV programme	0,7%
6. Unfamiliar with remote controls and interface conventions on digital television sets/ Set Top Boxes	10,9%
7. Finds it difficult/ impossible to make use of access services such as Subtitles (SDH) or Audio Description	9,4%
8. Finds it difficult to switch gaze from screen to remote control device	3,4%
9. Finds it difficult to read subtitles (and other On Screen Displays including Electronic Programme Guides)	3,4%
10. Finds it difficult/impossible to use the television receiver using a remote control device	10,9%
11. Finds it difficult/impossible to set up and configure TV set or Set Top Box	10,9%

Source: Estimates made using Grundy (1999) with the online data set accessible at: http://www.eng.cam.ac.uk/inclusivedesign/index.php?section=data&page=exclusion_calc

The following should be noted:

- With the exception of issue #4, there is a positive correlation between the proportion of the population that are excluded and their age. A markedly higher proportion of the 70+ age group have one or more disability compared with the 16-49 age group.
- The ability to understand speech in a foreign language such as English is minimal among small children. The proportion able to understand a foreign language increases among adolescents and young adults and declines again among older people who may not have had foreign languages at school. This has implications in small countries where a significant proportion of television output requires dubbing, voice-overs/lectoring or subtitles for inter-lingual communication in addition to intralingual access services in order to make the programme accessible. There is a detailed explanation of these issues in Appendix 2.

The supply side of e-inclusiveness (restricted to “what” is supplied; supply chain issues are addressed in 3.2)

- C. Mention of which of the following aspects of digital television are currently offered by the broadcaster in question on free-to-air television (digital terrestrial and digital satellite or cable, if this is appropriate):

Electronic Programming Guide, EPG.

- “Present” and “Following”
- EPG with listings for 24 hours to 8 days
- General attributes of TV programmes (what metadata, that is data about data, categories are included)
- Whether and how access service(s) are mentioned in “Present” and “Following”/EPG

Digital Text Service

- Teletext (information service)
- “2nd Generation Digital Text” (information service)

Opt-in services

- On Screen Displays (OSDs)
- closed subtitles (e.g. teletext or Digital Video Broadcasting (DVB)-subtitles that can be turned on or off by the user)
- dual language audio tracks (e.g. Castilian/Catalan)
- alternative stereo audio tracks (Audio description – broadcaster mix)
- alternative audio tracks (receiver mix)
- alternative video track (e.g. visual signing in Denmark)

Interactive television: WIMPs (Windows, Icons, Menus and Peripherals) and interactive features that require the use of a remote control device).

- Remote control devices with colour or number buttons used with in-vision prompts on the television screen (a selection of photos of the most common models available in the territory in question will be obtained)
- Arrow keys and OK/ Confirm buttons used to select and confirm choice
- Other interface issues of relevance to access services and e-inclusiveness

- D. The current availability of mature access services for free-to-air television (digital terrestrial and digital satellite or cable, if this is appropriate):

- Subtitles (“closed” SDH, “closed” subtitles with translations of foreign languages)
- Dubbing and lectoring (commonly termed “voice-overs”)
- Audio Description (AD Broadcaster mix, AD Receiver mix - specify the technology used)
- Audio subtitles (specify the technology used)
- Visual signing (“closed” / “open” solutions - specify the technology used)

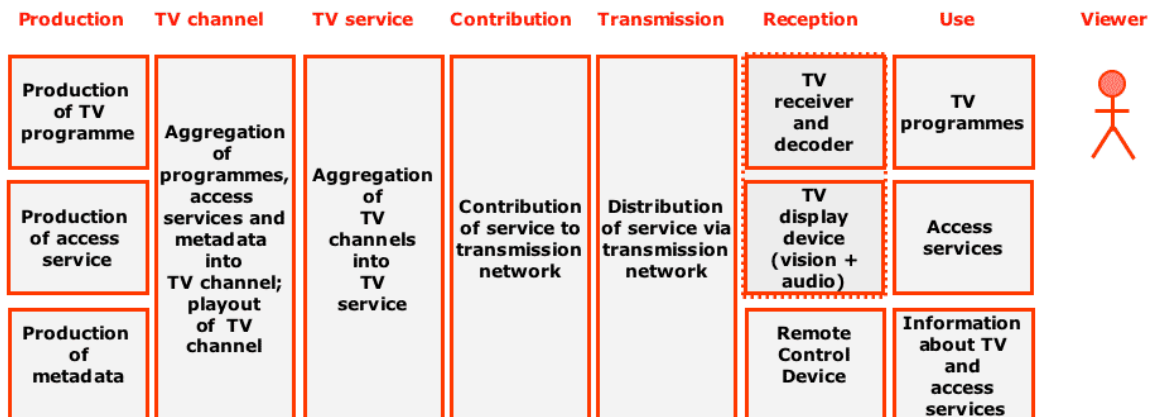
- E. Information for each mature service for 2008 covering:

- The proportion of annual television output (combined figure for both first airings and repeats) for which it is available
- The content genre categories for which it is produced (c.f. E-Book use of DVB content genre categories and their interpretation in Appendix 1).
- Mention of the scheduling of the service (morning, afternoon, evening [=prime-time], night)

- Whether the service is inclusive, assistive or somewhere between the two (c.f. the scenarios A-C described in section 4.1.3 of D1.1).
 - Mention of the minimum digital television receiver technical requirements to deliver the access service
 - Information regarding current practises related to the setting-up and use of digital television receivers, displays and remote control devices (what help is available to the user from whom).
 - Promotion: mention of how the potential users are made aware of the existence of the service and what it takes to make use of it, including any recent campaigns and their impact, if known.
- F. Forecasts for each access service for the broadcaster in question in the period to 2012
- The proportion of annual television output (combined figure for both first airings and repeats) for which it will be available in 2009, 2010 and 2011 – where known.
 - The content genre categories for which it will be produced
 - Mention of the scheduling of the service (morning, afternoon, evening (prime-time), night)
 - Whether the service will be inclusive, assistive or between the two
- G. End user assessments of e-inclusiveness (cf. DoW page 13) collated with reference to the following general metrics:
- Awareness of the existence of access services
 - Being able to discover and gain access to access services associated with digital television
 - The ease of use of the access service
 - The usefulness of the access service and
 - The attractiveness of the access service.

3.2 What are the options to meet the e-inclusiveness challenge with mature access services?

This task deals with the stakeholders in the supply chain and their views on issues relating to the planning, production, delivery, promotion and use of mature access services to promote the e-inclusiveness of digital television.



For Berlin-Brandenburg, Catalonia, Denmark and Italy, the following kinds of information will be needed:

H. Identification of formal e-inclusiveness guidelines, informal “good practice” in current work flows for digital television *to identify any usability and accessibility issues* in connection with:

Electronic Programming Guide, EPG.

- “Present” and ”Following”
- EPG with listings for 24 hours to 8 days
- General attributes of TV programmes (what metadata categories are included)
- Whether and how access service(s) are mentioned in “Present” and ”Following”/EPG

Digital Text Service

- Teletext (information service)
- 2nd Generation Digital Text (information service)

Opt-in services

- On Screen Displays (OSDs)
- closed subtitles (e.g. teletext or DVB-subtitles that can be turned on or off by the user)
- dual language audio tracks (e.g. Castilian/Catalan)
- alternative stereo audio tracks (Audio description – broadcaster mix)
- alternative audio tracks (receiver mix)
- alternative video track (e.g. visual signing in Denmark)

Interactive television: WIMPs (Windows, Icons, Menus and Peripherals) and interactive features that require the use of a remote control device).

- Remote control devices with colour or number buttons used with in-vision prompts on the television screen.
- Arrow keys and OK/ Confirm buttons used to select and confirm choice
- Other interface issues of relevance to access services and e-inclusiveness

I. A general description of the supply chain and work flows for each of the following mature access services for free-to-air television (digital terrestrial and digital satellite or cable, if this is appropriate):

- Subtitles (“closed” SDH, “closed” subtitles with translations of foreign languages)
- Dubbing and lectoring (commonly termed “voice-overs”)
- Audio Description (AD Broadcaster mix, AD Receiver mix- specify the technology used)
- Audio subtitles (specify the technology used)
- Visual signing (“closed” and “open” solutions - specify the technology used)

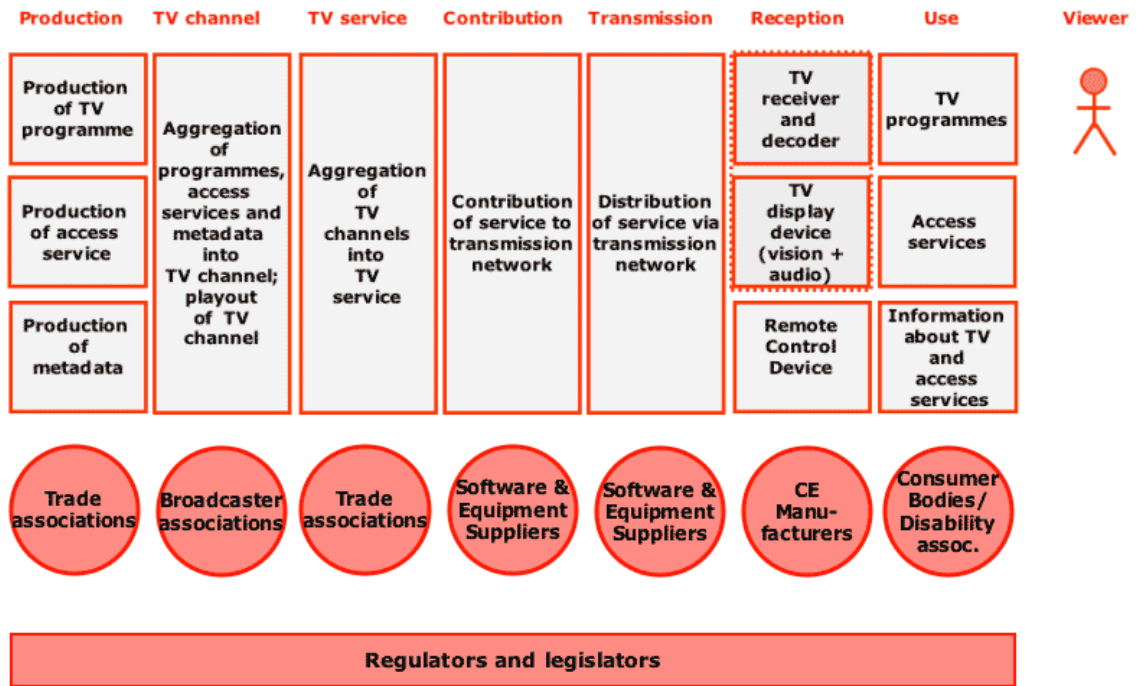
The description should include the principal stakeholders.

Appendix 1 contains some additional discussions of the issues related to these access services.

- J. A review of the main supply chain and work flow issues for each of the mature access services in (I) from the perspective of each of the stakeholders in the supply chain:
- Planning and policy issues (in particular where there are competing or conflicting uses of access services that prevent full e-inclusiveness)
 - Production issues
 - Delivery issues including scalability
 - Promotion issues and
 - Issues related to the discovery, access and use of access services.
- K. Foreseen issues in relation to each access service for the broadcaster in question in the period to 2012
- Planning and policy issues (in particular where there are competing or conflicting uses of access services that prevent full e-inclusiveness)
 - Production issues
 - Delivery issues including scalability, the impact of second-generation digital television platforms
 - Promotion issues and
 - Issues related to the discovery, access and use of access services.

3.3 What are business models for sustainable e-inclusiveness & how does regulation influence it?

This task deals with the business models underpinning access services. It seems necessary to identify the business models behind digital television and the provision of access services for digital TV. As there are often several options for dealing with a given access problem, promoting the uptake of mature access services will require an understanding of the revenue flows – not just what comes in but in general terms, what are the total costs of providing access services all down the supply chain?



It also covers stakeholders *external* to the supply chain and their views on issues relating to

- Planning,
- Production,
- Delivery,
- Promotion and
- Use of mature access services to promote the e-inclusiveness of digital television.

These business models need to be discussed in relation to the regulatory climate and consensus governing social equity in each country or territory.

We assume that we can provide some examples of cost structures and revenue streams following interviews with stakeholders in the value chain. There may be areas where this is sensitive business data, so caution will be required.

The Pilot Project needs to identify areas where there are known to be conflicting policies and issues influencing mature access services.

Section 3.3 therefore requires the following kinds of information for Berlin-Brandenburg, Catalonia, Denmark and Italy:

- L. The business model(s) and revenue streams for on free-to-air television (digital terrestrial and digital satellite or cable, if this is appropriate):
 - For digital television itself (c.f. section 5.1 C of D1.1)
 - For each of the mature access services identified (c.f. section 5.1 D of D1.1).

- M. Generic cost structures for a given service from start to finish in the supply chain (what in general terms are the hourly and/or annual costs involved at each point in the value chain?).³
- N. The regulatory framework governing e-inclusiveness in the country in question, media legislation and regulations, public service remits and contracts, and also competition, industry and social legislation and guidelines impacting e-inclusiveness. There may well be European, national and sub-national legislation involved.

The inputs produced in A-N will then be used for WP2.5 (D2.6) to provide a generic *Access Service Maturity Model* indicating what kinds of strategic issues need to be addressed at the various stages in the lifecycle of an access service. The 9 stages are:

1. *A political or regulatory go-ahead for the introduction of a new, mature access service in a territory where this has not yet been introduced.* (Access problems that are to be addressed, access solutions that fit the bill, business models)
2. *The overall planning of a new, mature access service* (Objectives, metrics, identifying the stakeholders in the supply chain, workflows)
3. *Consultations and testing of the features of the new service* (Participatory design of prototypes of the service with stakeholders - users, the supply chain, regulators).
4. *Detailed planning of the new, mature service.* (Planning, production and distribution of the final access service itself)
5. *Test production and validation of the new service.* (Process evaluation of the production and distribution of the access service, check conformity with objectives and metrics from (2))
6. *The new service enters operation - “soft launch”.* (Process evaluation and fine-tuning of the production and distribution of the access service; appropriate receivers are available, but not necessarily widespread; stakeholders informed)
7. *The new service is formally launched and scaled up to its final target level.* (Promotion of the service, audience research on take-up and use of the service, changes in objectives, metrics/targets, benchmarking the production and distribution of the access service; there is a wide range of receivers capable of facilitating the access service)
8. *Identification of challenges to the viability of the service emerge from various quarters.* (Life cycle decisions about service viability)
9. *The service is phased out in favour of something else.* (Planning the transition of one generation of the service to the next).

³ An example here is AD (broadcaster mix). At DR, a second set of stereo audio is mixed and played out along with the original audio for television drama programmes. At Red Bee and the BBC, however, the stereo mix is created on the fly at playout from the Audio Description files and the production metadata governing the relative levels of the AD and the original sound. The same audio resources and metadata can be used for building and playing out the file needed for AD Receiver Mix, making the UK solution more cost-effective but possibly more risk-prone.

4 The tests to be performed by academics

The DTV4All project envisages two types of tests of mature services:

1. Guided tests will be performed by the university consortium under laboratory conditions to check on the many parameters present in subtitling for the deaf and audio description.
2. Broadcasters (DR, RBB and TVC) will perform field tests of mature services which are broadcast and will be tested with an unguided audience.

In the laboratory qualitative tests with users will be performed on a one-to-one basis using the latest eye-tracking technology, the Tobii Eye-tracker. The laboratory tests which will be performed are:

Subtitling for the Deaf and Hard of Hearing (SDH)

Subtitling for language translation and Subtitling for the Deaf and Hard of Hearing (SDH) has been widely available in analog broadcasting through the use of teletext. The shift to DTV offers endless possibilities to create both subtitles for language translation and SDH which can make a difference and optimise greatly their acceptance by users.

One of the most common problems often attributed to Subtitling for the Deaf and Hard-of-Hearing (SDH) as a service for the viewers is the absence of a) a common standard within and across countries and b) active consultation with the Deaf and hard-of-hearing audience. The present study is an attempt to resort to the latter as a means to explore the possibility of achieving the former. With this objective in mind researchers from different EU countries will carry out experiments in eight different languages to examine the viewers' preferences with regard to some of the most important features of SDH: font and size, position, justification, character identification, context information (icons & emoticons), boxes, borders and shadows. It is interesting to note that the countries/languages chosen respond to a broadcasting tradition: Italy and Spain with dubbing, Denmark, Greece and Belgium with subtitling, Belgium and Catalonia are multilingual while UK is the EU country where media accessibility has had most impact. Poland is the only country where SDH shares its relevance with a different method: Voice-over.

In every case, the tests will be carried out first with users made up of three different groups: Deaf, hard-of-hearing and hearing viewers. Selected excerpts from the film *Stuart Little 2* (because it is one of the few films which has been dubbed in all languages used in the tests) will be subtitled, providing the participants with different variables for every parameter. A number of questionnaires will be handed out with specific questions about readability, preferences and conventions, always taking into account the viewers' background (age, hearing capacity, education, etc).

In order to check the veracity of the data obtained in tests which are conducted by personal interviews, validating tests will be carried out with the help of an eye tracker and comprehension tests.

The following tasks will be completed:

Task S-1 Testing of formal subtitle parameters (1): Layout

Results of tests carried out with Deaf, hard-of-hearing and hearing participants across three countries: Spain, UK, and Italy will be collated. The tests will include the viewers' opinion on five formal subtitling parameters: font, size, position, justification and character identification.

Task S-2 Testing of formal subtitle parameters (2): Legibility

2.1. Results of tests carried out with Deaf, hard-of-hearing and hearing participants across two more countries: Belgium and Poland will be collated. Once again, the tests will cover font, size, position, justification and character identification.

2.2. Results of tests carried out in Belgium, Poland and Spain on the use of boxes, borders and shadows in subtitles will be collated. Spain will join this phase as a control group.

Task S-3 Testing of formal subtitling parameters (3): Innovation

Results of tests carried out with Deaf, hard-of-hearing and hearing participants across five countries (Spain UK, Belgium, Italy and Poland) on the use of icons and emoticons in subtitles will be collated.

Task S-4 Drafting of long questionnaires

Long questionnaires on the viewer's habits and general opinions regarding subtitling will be drafted. These will not ask specific questions about the tests. The questionnaires will be distributed in Spain, Poland, UK, Belgium, Italy, Greece and Denmark.

Task S-5 Compilation of long questionnaires

The long questionnaires returned will be compiled and their data on the viewers' habits and general opinions regarding subtitling in Spain, Poland, Spain, UK, Belgium, Italy, Greece and Denmark, will be processed. At the completion of this stage, the project team will have a view of the subjective preferences of viewers from different European countries regarding SDH resulting both from the tests and the long questionnaires. The next stage is to test this view empirically using eye-tracking technology.

Task S-6 Validation tests using eye-tracking technology

Results of validation tests using eye-tracking technology: these tests will produce empirical evidence on the formal subtitling parameters tested in tasks S-1, S-2 and S-3 across groups A (UK, Italy) and D (Spain). Comprehension tests will be performed together with the use of an eye-tracking to validate data.

These tests will also produce empirical evidence on the formal subtitling parameters tested in task 1, 2 and 3 across groups B (Belgium, Poland) and C (Denmark / Greece). Comprehension tests will be performed together with eye-tracking in order to validate data.

Task S-7 Testing language comprehension

Results of tests about the viewers’ comprehension of subtitles across eight countries: Spain, Poland, UK, Belgium, Italy, Greece and Denmark will be collated. The tests will establish the viewers’ opinions on three different subtitle formats (verbatim, standard and adapted to sign language) and will provide data about their comprehension of the different formats.

Task S-8 Final report

Results from all the tasks will be considered to address the following hypotheses:

- There is a need and the potential for Europe-wide SDH guidelines
- There is a need to determine the relevance of users’ feedback in the set-up of guidelines
- There is a need to empirically determine the technical parameters of SDH

In the light of these findings, the report will make recommendations relating to both the format and the content of SDH, as well as the training of subtitlers.

The following chart shows the timing of the work which will be done on subtitling

	FIRST YEAR				SECOND YEAR			
	1	5	8	12	16	22	24	
TASK 1 – Formal subtitling parameters: LAYOUT								
1.1.1 Font								
1.1.2 Size								
1.1.3 Character Identification								
1.1.4 Position								
1.1.5 Justification								
TASK 2 – Formal subtitling parameters: LEGIBILITY								
2.1 Boxes								
2.2 Border								
2.3 Shadow								

TASK 3 – Formal subtitling parameters: INNOVATION							
3.1 Emoticons							
3.2 Icons							
TASK 4 – Drafting Long Questionnaires							
4.1 Drafting comprehensive questionnaires to be completed							
TASK 5 – Compilation of Long Questionnaires							
5.1 Compilation of comprehensive questionnaires and data processing							
TASK 6 – Verification with eye-tracking							
6.1 Verification of formal subtitling parameters (phases 1 / 2 / 3) with eye-tracking + comprehension							
TASK 7- Testing language comprehension							
7.1 Verbatim							
7.2 Standard							
7.3 Adapted							
TASK 7- Testing comprehension							
8.1- Final Report							

GROUP A: UK, Italy
 GROUP B: Belgium, Poland
 GROUP C: Greece, Denmark
 GROUP D: (control group): Spain

User groups:

For the testing of subtitling the user groups will comprise 30 users per country: Belgium, Denmark, Italy, Poland, Spain, and the UK.

The users fall into three categories of hearing impairment:

1. Signing deaf and oralist deaf people within the macrocategory deaf
2. Hard of hearing people
3. Presbiacousic older people becoming deaf because of age related impairment

The user groups will also include some hearing people

Part of the tests will be run at the University. Others at the head office of the deaf associations:

- Belgium: FEVLADO (FEderatie van VLAamse DOvenorganisaties)
- Poland: National Association of the Deaf (Polski Związek Głuchych, PZG)
- Spain: Arabaco Gorraak (Asociación de Personas Sordas de Álava) Aransbur (Centro María Cristina, Burgos) Asociación de Sordos de Madrid, Centro de Sordos de Palencia, Fiapas

Audio Description (AD)

While some audio description (AD) guidelines have been already published and national standards are a fact in some countries, little research has been carried out on how well such guidelines travel and whether the cultural determinants underlying AD permit efficient cross-cultural translation. Scientific studies yielding some insight into the feasibility of creating European audio standards, and a common European practice of quality Audio Description, would be most welcome. With this in mind a team of researchers across Europe set up a common project within the DTV4All project which takes the ‘old’ Pear Tree Project (1980) as its starting point.

This research is indeed targeted at developing international guidelines and standards for audio description, which are crucial to improvements in media accessibility for blind and visually impaired people. At the risk of oversimplification, it can be said that whereas subtitles improve media accessibility by letting audiences read what they cannot hear; audio description allows audiences to hear an account of what they cannot see. Recent social, legal and technical developments mean that the amount of audio description being produced globally is rising steeply.

It is hoped that the findings of the work carried out under the umbrella of the DTV4All project will inform the standardisation of international audio description practice as to what information about a film's story should be included in audio descriptions and how it should be linguistically encoded. Whereas much previous research in audiovisual translation has tended to concentrate on close analyses of small monolingual samples of actual audio description, this research is intended to be basic in nature by providing to the audio description community an understanding of how language and culture affect the ways in which moving images are put into words. The project has a high degree of practical import, but is also of key interest to researchers in a variety of fields concerned with the relationships between the visual and the verbal (philosophy, aesthetics), vision and language (cognitive science, artificial intelligence), and image data and text data (multimedia computing).

The following tasks will be completed:

Task AD-1 Survey of the European Audio Description Landscape

1.1 An account of the state of audio description practice in Europe will be written. It will present all the different guidelines across EU countries.

1.2 A detailed comparison of different audio description workflows will be made. This will look at working practice at Red Bee Media where audio description and subtitling are done by different people and TVC where the same person produces both subtitles and AD.

Task AD-2 Pear Stories 2

2.1 A preliminary comparison of AD transcripts according to Tannen's features will be made.

2.2 An in-depth comparison of how transcripts select and present information about the Pear Story film will be made.

Task AD-3 Translation of audio descriptions

A professional describer creates an AD from scratch whereas a professional Audio Video (AV) translator translates and adapts an AD. A comparison in terms of time taken of description and translation will be made.

Task AD-4 Perception of visual inputs: scientific testing with an eye tracking

Using an eye tracker these tests aim to compare how different informants focus their attention on the screen while verbalising what they have seen. These tests allow us to identify relevant visual inputs with language output.

Task AD-5 Final Report

Results from all the AD tasks will be considered to address the following hypotheses:

- There is a need and the potential for Europe-wide audio description guidelines
- Audio description can be translated effectively and efficiently
- It is cost effective for the same person to audio describe and subtitle

In the light of the findings the report will make recommendations relating to the audio description workflow, the content of audio description and the training of audio describers.

The following chart shows the timing of the work which will be done on audio description.

	FIRST YEAR				SECOND YEAR		
	1	5	8	12	16	22	24
TASK 1 – A Survey of the European Audio Description Landscape							
1.1 Overview of AD in Europe							
1.2 AD workflows							
TASK 2 – Pear Story							
2.1 Set up and preliminary comparison							
2.2 How transcripts select and present information							
TASK 3 – Translation of AD							
3. Set up tests							
TASK 4 – Perception by Eye tracker							
4. Set up and validate tests							

Audio description user group sizes and locations

For the audio description tests the user groups will be made up exclusively of sighted students. The audio description test groups will comprise such 20 users per country: Belgium, Denmark, Italy, Poland, Spain, and the UK.

Audio Subtitling (AS)

At a conferenceⁱ in 1999 the initiative for an implementation project for spoken subtitles was born (Theunisz, 2002). The primary objective was to make foreign TV programmes more accessible for those who are visually impaired, and also for the elderly, and for people with language impairments such as aphasia or dyslexia, or cognitive impairment such as mental retardation or decreased concentration. The technology required to bring spoken subtitles to the home was a decoding system. Broadcasters needed a speech-synthesis computer which is fitted with speech-synthesis software converting text into speech. This output is then converted into a signal and broadcast without disturbing the programme.

The project “Spoken Subtitles” was developed and evaluated with a high degree of acceptance,ⁱⁱ and on 14th December 2001 the audio subtitling service was officially opened by the Dutch Secretary of State and the president of the NOS. Audio subtitling has been implemented as a permanent service on Dutch TV.

The work will be developed by Sabine Braun and Pilar Orero within the DTV4All project, their work will entail:

Task AS-1 Report on the technological development of Spoken Subtitles in The Netherlands and users’ comments about the system

Task AS-2 While audio subtitling has not been widely available, as yet, for broadcasting across European countries, it is used when foreign films are audio described into English.

A report will be written describing the many possible combinations found in the following DVDs available in the United Kingdom: *The Passion of Christ*, *Hero*, *Syriana*, *Borat*, *Letters of Iwo Jima*, *Everything is Illuminated* and *Volver*. In light of these findings the report will make a guide of good practice when audio subtitling foreign language productions either for broadcasting or DVDs.

The following chart shows the timing of the work which will be done on audio subtitling.

	FIRST YEAR				SECOND YEAR		
	1	5	8	12	16	22	24
TASK 1 – Update text to voice technologies and reception							
TASK 2 – AST good practice guide							

5 The field trials to be performed by Broadcasters

Two different set of tests have been devised by the broadcasters in order to obtain direct feedback from users.

5.1 RBB

5.1

- RBB will broadcast DVB-Subtitles and later on possibly also Clean Audio in a testing period of 12 months (Jan-Dec 2009)
- The content will be broadcast via Digital Video Broadcast – Terrestrial (DVB-T) and thus be available to any DVB-T set top box in the respective area (there are 1.5 million such reception devices) – theoretically. However, the tests will not yet be announced to a broader audience.
- The RBB Field Trial will be supported by 51 subtitle users (hard-of-hearing to deaf)
- Test users will be supplied with a set top box in order to facilitate technical support.
- Testers will get a simple questionnaire which they have to answer once a week, i.e. after each change of testing parameters. The draft questionnaire as well as all other material made available to the testers is being checked by experts from the respective disability associations.
- The whole field trial is organised in close cooperation with Berlin's and Brandenburg's impairment associations who also assist in acquiring the testers.
- DVB-Subtitle tests will be performed from January to October 2009. Clean Audio tests will be performed in November and December 2009.

5.1.1 Test 1: DVB-Subtitles

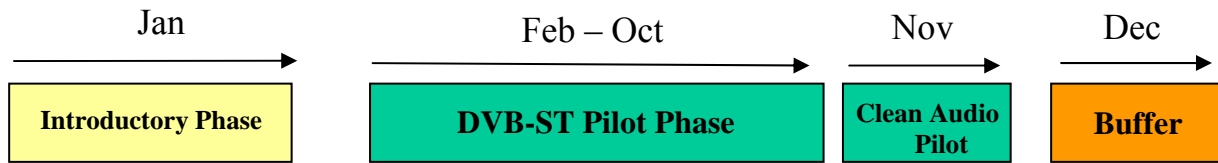
- February – October 2009 (with Nov/Dec as a buffer) DVB-ST (bitmap-based) will be broadcast over DVB-T.
- Existing Teletext subtitles will be automatically transcoded in real-time by a transcoder module. The transcoder module that was finally chosen by RBB was tested thoroughly and was compared with other solutions. It is mature and has been used by the second largest public broadcaster in Germany, ZDF.
- Analogue Teletext subtitles will exist as they have up to now.
- Basically, the tests aim at finding out which appearance and design of the subtitles offered is judged best by the target group.
- For this, 26 parameters of the subtitles have been defined for the first 26 test weeks. There are ten weeks left then to test further parameters, issues arisen from the first test weeks and possibly also questions that go beyond the pure design of the subtitles (content related aspects). This will depend on the first test results and on the advice and requirements of the RBB videotext production department.

- All 51 users are equipped with a set-top-box by RBB. To this end, 13 types set-top-boxes were tested thoroughly in relation to two different types of transcoding modules for analogue teletext that were also tested separately for their suitability of producing DVB-subtitles in the RBB environment. In the end, four set-top-boxes were found to bring satisfying results with the finally chosen transcoder module. One of these turned out to bring slightly better results and was chosen to be handed out to the testers.
- Two members of the RBB project team install the devices at peoples' homes. They spend about an hour time with them (supported by a signer if required) and explain the handling of the device, the use of the DVB-subtitles and the testing procedures in great detail to them. The testers receive a manual and are encouraged to ask questions to the project team any time.
- Parameter types to be tested (others may be added):
 - i) Font Size
 - ii) Font Type
 - iii) Background Style (“outline”, “boxed”, “banded”)
- Every Monday one parameter will be changed and the new test week begins.
- Every Friday testers receive a questionnaire for the test week to come. The questionnaire is kept quite simple based on feedback of the user associations. At the end of each week test users will be asked to answer a limited set of questions on the visual appearance of the subtitles and also of any problems encountered (this basically involves making eight crosses and potentially adding text to two free text boxes). Questions are such as:
 - i) The size of the font is (Scale from “very good” to “very bad”)
 - ii) The type of font is ... (Scale from “very good” to “very bad”)
 - iii) The background is (Scale from “very good” to “very bad”)
 - iv) The subtitles are....(Scale from “very good” to “very bad
 - v) Any further comments on the subtitles of this week? (Free text)
 - vi) Did you encounter any problems using subtitles this week? (Free text)

5.1.2 Test 2: Clean Audio

- During November Clean Audio services will be tested with a part of the above user group. Ideally, all 25 hard of hearing people will be involved, the preceding laboratory tests, however, will show whether the clean audio services are suitable for all grades of hearing impairments. Furthermore, clean audio being an emerging rather than a mature service (it is dealt with in WP3), the feasibility of such live tests will be examined in the course of its laboratory tests (RBB and IRT). It might be more suitable to provide the test persons with DVDs with clean audio samples rather than broadcast the clean audio service via DVB-T. This would allow more variations to be tested.
- Depending on the above the established test procedures will be adapted.
- Various parameters will be pre-tested under laboratory conditions

5.2 Schedule



5.2 DR

DR's user group for the pilot tests those with visual impairments, and those with hearing impairments. The Danish perspective in the pilot of mature services is somewhat different from the others, in that all of the main access provisions are now in regular use. The pilot needs to document not how to *set up* a given service, but either to scale up that service to 100% coverage, or to migrate a given service to second generation digital TV involving MPEG-4 and HD.

DR has a longstanding co-operation with national organisations for those with visual and hearing disabilities, primarily *Dansk Blindesamfund* and their opposite number for the deaf and hard of hearing. The aim is to recruit a total of 90 individuals who can take part in user tests in the course of 2009.

Each participant will be asked to complete a self-assessment of his/her capabilities using Danish language translations of the UK self-reporting scales originally developed in the UK and reported by Grundy (1999). DR hope that this can be administered in the other pilot countries, too, to ensure a common mechanism for assessing accessibility and e-inclusiveness.

As was explained in the DoW, DR has offered subtitling for the deaf and heard of hearing for decades, and signing on digital terrestrial television since it started it commenced.

The three priorities from DR's perspective are to increase subtitling to 100% in the next two years, agree on new targets for Audio Description on digital terrestrial television and find sustainable solutions for signing before DR's channels on digital terrestrial television migrate from MPEG-2 to MPEG-4, allowing for High Definition programming.

To this end DR have discussed and agreed upon the following research topics:

1. Subtitling
 - How is the current live subtitling service of, say, the main news at 18:30-19:00 regarded by users with hearing impairments? (To what extent does an error rate of 10%, which is typical of the current system, impair user understanding of the news? What kind of errors does the current approach generate and how does this map with the users' expectations of the service?)

- What are the options for live subtitling of news and events and their implications, given that public service television needs to reach its target of 100% subtitling by the end of 2010? (DR is currently using a re-speaking system coupled with speech recognition to generate subtitles for live programmes and have identified a number of problems. Should DR continue to optimise the current system, find funds for purchasing a competing solution, switch to a labour-intensive solution such as the one currently used by TVC in Catalonia or outsource this live subtitling to a commercial access service provider?)
2. Audio description
- What do current users of AD for fiction think of the service? (Awareness of the existence of the service, ability to find programmes offering AD, access and usability issues associated with finding and using AD on their own or when viewing TV with family and friends).
 - What are users' priorities for extending the coverage of programming with AD? (content genre)
 - What are the relative priorities of offering, say, a limited amount of AD compared with using the same financial resources to increase the percentage of television for which audio subtitles could be offered? (consultations in November 2008 with those representing the deaf and hard of hearing expressed an interest in discussing the trade-offs between AD and audio subtitles, especially if a generic solution using DVB subtitles and speech synthesis could increase the accessibility of television programming).
3. Signing
- What are users' wishes and requirements in the transition to MPEG-4/HD solutions on digital terrestrial television? (The current solution is a virtual Standard Definition channel that appears on digital terrestrial television from 17:00 – 20:00 with a signer covering two-thirds of screen height. A new solution using MPEG-4 encoding to deliver both Standard Definition and High Definition programmes that would not exceed the current bandwidth requirements has to be found before the end of 2010 when the existing multiplex is re-engineered to use MPEG-4. Part of this work would be to document the original participatory development model in which a range of solutions were produced and tested with and for their intended users.

DR have proposed to use a simple measure of user acceptance that requires participants to watch /listen to a TV programme and to press the space bar of a simple recording device at any point where they feel there is a problem following the programme. After the viewing session, a recording of the viewed programme will be replayed at the points where the subject reported there was a communication issue and the researcher will be required to identify with the subject what the nature of the problem was.

This evaluation method has been used by DR to assess subtitling issues since 1997 and we have developed a generic tool that allows us to gauge subject satisfaction/discontent without prompting him/her to look for specific problems. It can be used by all with the possible exception of those with impaired manual dexterity.

In the spring and autumn of 2008, DR has held a series of meetings with organisations representing those with disabilities to discuss future action on access services. They are DR's contacts and can help DR and its partner, the University of Copenhagen, to recruit the panel of approximately 90 subjects through their contacts and existing communication channels.

User tests to elucidate the three research topics above will start by the end of March and run for the rest of 2009. If required, the period can be extended into 2010. The advantage for all access services is that subtitling, AD and signing now are all in regular service and will continue indefinitely, allowing for additional tests as and when this suits the target users.

5.3 TVC

Context

In 2008, TVC provided subtitles for 2.6% of foreign language programmes (films) and SDH for 45 % of national language programmes, a 7 % increasing over 2007.

For each of TVC's channels the percentage of subtitled programming in 2008 was: TV3: 54 %; K33: 40 %; K3D 44 %; 33D: 13 %, 300: 17 %, respectively. The plan is to increase the percentage of subtitled programming by 3 % in 2009.

In 2008 4% of TVC's programming was accompanied by audio description. It is planned to increase this to 5% of programming in 2009 which represents a 25% increasing in the total amount of programming with audio description.

The content genres for which the access services are being produced are:

Subtitling: News, films, series, talk-shows
Audio description: Films, series
Signing language: News

TVC is in close contact with all the accessibility associations. Each week the programming schedules for access services are sent to the associations. TVC participates in meetings with the associations and receives a lot of e-mails from users and associations with feedback about services and demands for more programming to be accompanied by access services and with specific recommendations. The associations have internally very good communication and this helps ensure users are made aware of the information in TV promotions and the press on the schedules for access services.

The access services all use the standard menus of a DT receivers and standard remote controllers as they require only normal DTT set-top-boxes and integrated receivers. The receivers only need to be able to render secondary audio. Accordingly, the audio description is broadcaster mix. With subtitles, if the television receiver is set to Spanish (Castilian) as the preferred language, it can hide subtitles in Catalan (and Arabic) as option. This happens only in some brands and models. Generally, closed subtitles are provided for hearing impaired people but open subtitles are provided with some programs. Visual signing is also provided in both open and closed formats.

TVC uses traditional teletext with its accompanying services to provide subtitles for the hearing impaired with DTT. It delivers three kinds of subtitles

1. Recorded in a file associated with the recorded program
2. Semi-direct, produced live, but mixed with the scripts of the news program.
3. Fully direct with the work of 5 operators that write the transcription on the fly under the sequence of a visual “passing token”

A variety of information is regularly included in MHP format with DTT channels

Audio Description (AD):

Background

TVC are piloting an existing AD service to increase the maturity of the service in terms of optimal exploitation practice, reliability, and quality for the users.

TVC was doing preparatory activities on AD in the last quarter of 2006. In first half of 2007 it started the service providing 80 hours of programming with AD during the whole year. Subsequently, the system of production of the service has been refined in progressive steps:

- The software for creation of the audio description file has been improved several times. This has produced modifications in the audio processing, for example, for the optimization of the level of the voice of the audio descriptions tending to a normalising of the level of the voice, and also in the concept and processing of the automatic broadcaster mix operation.
- In the last round of reception of proposals for improvement of the software completed in 2009 coming from experienced operators-creators of Audio Description, TVC collected a list of 20 reasonable modifications to the application to improve the productivity of the tool and the quality of the final product.
- Another field the pilot encompasses is the improvement in the robustness of the system of launching the Audio Description to Air in the Continuity Studio. There are mechanisms for the delivery of the AD files to a storage and play out server that is being redesigned for robustness, and to increase the level of automation. There is, for example, automatic checking of the existence of AD files for each video program, and other checks to see if the stored file of AD has been prepared to be broadcast with each corresponding video etc.

- Feedback from users - Since starting the AD service TVC has received continuous feedback from its users. Proximity users (blind people) working in house, are sources of information about modifications and possible improvements as experienced users. TVC is also in contact with associations of blind and visually impaired people through their managers who are in permanent contact with TVC through mail and direct contact in periodic meetings of the sector, in which the TVC accessibility department is a participant. There are also a number of "activists" sending TVC emails with commentaries and suggestions. This is important as feedback.

Users tests for the AD Pilot

TVC has set up two types of tests for the pilot of AD.

Tests of type A will be of an open nature. The set up of these tests will be:

TVC will draft questionnaires in collaboration with expert users and UAB.

TVC will then contact the user associations ONCE and ACC to distribute the questionnaires amongst their associates.

TVC will then gather and analyse the questionnaires in collaboration with UAB for the drafting of final reports on the AD pilot

For these tests TVC aims gathering feedback from more than 40 users.

For these tests the users will be blind and visually impaired people.

Tests of type B will be of a restricted nature.

This means gathering feedback from fewer users in groups of around 10 people through personal interviews, and customized attention, looking for questions which have not been appearing in the broad questionnaires, and striving for personal observations on and feelings towards the service.

Issues that TVC shall request information on will be related to:

- Preferences for AD programmes, related to genres hierarchy.
- Access to the AD service: how do the users learn of availability of programmes with AD? What is the ease of access to the service (remote control /receiver menu)?
- Other people who can be users of the AD service.
- The level of acceptance of users of the existing AD services.
- Identification of errors, flaws and mis-functionality
- Problems with the quality of the broadcast mix.
- Style of the AD content: critical analysis and suggestions

Signing Language:

The service started in analogue TV broadcasts in 2003. Signing is broadcast in three slots each day at 9:00, 10:00 and 18:30, the signed material being news resumes broadcast with the 24 hour news program 3/24 consisting of three leads included at the start of news blocs. The hours of transmission were agreed with deaf collectives.

The percentage of TVC programming with signing is therefore small ~ 0.38% on the 24 hours news channel (3/24). This level will be maintained in 2009.

For this service TVC will obtain feedback from 10 users who will be signing deaf people contacted through the local users association FESOCA. TVC will try to meet with the users in their natural meeting environment that is a club where they go to watch a daily signed news lead. A questionnaire will be drafted with the aid of a sign interpreter, and will address issues related to:

- User acceptance of the service
- Screen resolution and size
- Suggestions about other programmes to be signed
- Quality of the style of signing
- How would the users like the service to be in the future

Through the Pilot TVC plans to check the best production circuit, for example, TVC mixes the signing video with the news programme signal at the moment of broadcasting, but the signal of signing and the news program with the insertion of signing is not stored permanently because it is not considered necessary to do so. Otherwise, as happens with the other accessibility services, TVC has an open access bureau where it receives first hand comments on the service in real time and through email if given the disability telephone access is not convenient.

Subtitling:

This service is in operation at present, and TVC has years of experience of subtitling since the service was first introduced in the second half of the 1990's. A distinction should be made between the three types of broadcast subtitled services available:

- Delayed or pre-produced subtitles codified over teletext in digital TV, as a derivation of the traditional optional subtitles sent with analog terrestrial TV (page 888). This option is produced for recorded programs, such as films, series, documentaries, etc. There is a variant of the presentation of this service through DVB-T as subtitling system graphics. With this TVC has been transmitting optional subtitles in the English language, and in Arabic for a small number of programs. This service is called “delayed” subtitles. But there are another two modalities.
- Semi-direct subtitling. This second modality is used on news programs. The texts of the comments of the news presenters are already written and they are copied in the screen of a PC application where they can be launched by the subtitling operator, who can also add commentaries or short descriptions when needed.
- Direct subtitling. Given that to date there is no speech recognition technology in the Catalan language available for creating live subtitling by respeaking, TVC has had to resort to a system developed in-house. This relies on a pool of 5 subtitling operators taking turns to type every few seconds. This rotational strategy permits the subtitling operators' time to be divided in such a way as to make live subtitling possible.

Users taking part in these tests will include signing deaf, hard of hearing, and deaf persons. The number of users will be a minimum of ten users from each category for each questionnaire when dealing with individual interviews. For questionnaires sent through users associations via email TVC will aim at getting feedback from a minimum of 40 users. TVC will try at all times to make sure the samples of user feedback are significant enough to provide meaningful results.

Taking the three systems into account TVC has devised some tests which can be grouped by the methodology used in data gathering. Interviews with a limited number of users where a more detailed questionnaire will be addressed, and general questionnaires delivered through user associations. Both general questionnaires and individual interviews will contain questions derived from self-reporting scales originally developed in the UK and reported by Grundy (1999) which have been translated into Catalan.

General questionnaires will have three sections related to the three type of services already identified. Questions will cover user acceptance related to screen presentation, readability and legibility, style, and content, especially with respect to the descriptive quotations which are a feature of subtitling for the deaf and hard of hearing of both films and news.

This is the general setup of the tests which will go under scrutiny with UAB in order to establish whether the tests will be based in some cases on the subtitling of recorded programmes or on the subtitling of live broadcasts. The dates of tests and user associations to be contacted will now have to be agreed upon.

5.4 RAI

RAI will contribute to the analysis and evaluation of existing mature access services delivered over Digital TV by:

- Providing Italian TV contents with subtitling
- Providing Italian news programmes with sign language, script in natural language and verbatim script of the signs (sequences of words representing the signs)
- Providing expertise in speech recognition for subtitling
- Providing expertise in avatar technology for signing

RAI will evaluate these services with a user group of 50 deaf, hard of hearing and hearing persons in association with Fiadda (Federation of the families of Hard of Hearing children) and Ens (Italian national association of the deaf).

6. Concluding Remarks

The DTV4All project will evaluate a major pilot of on-air mature access services in four countries, Denmark, Germany Italy and Spain (in Catalunya). Effective evaluation will be ensured through the extensive and systematic gathering of feedback on the access services from substantial groups of access service users in close collaboration with their user associations.

The RBB Field Trial of subtitling will be supported by 51 subtitle users (hard-of-hearing to deaf). Its clean audio services will be tested with a part of this user group. Ideally, all 25 hard of hearing people will be involved,

For the user evaluation of its subtitling, signing, and audio description services DR aims to recruit a total of 90 individuals who can take part in its user tests in co-operation with Danish national organisations for visual and hearing disabilities.

For its user tests of audio description TVC aims at gathering feedback from more than 40 users using questionnaires and from groups of around 10 people through personal interviews.

For its signing service TVC will obtain feedback from 10 users who will be signing deaf people contacted through the local users association FESOCA.

For its user evaluation of subtitling for questionnaires sent through users associations via email TVC will aim at getting feedback from a minimum of 40 users.

RAI will evaluate its services with a user group of 50 deaf, hard of hearing and hearing persons in association with *Fiadda* (Federation of the families of Hard of Hearing children) and *Ens* (Italian national association of the deaf).

In addition, laboratory tests will be carried out in support of the evaluation of the mature services piloted by the broadcasters by academics in Belgium, Denmark, Greece, Italy, Poland, Spain, and the UK. For the testing of subtitling the user groups will comprise 30 users per country. The audio description test groups will comprise such 20 users per country:

Appendix 1: Access problems, causes, solutions and technical options

Problem	Cause	Solution	Technical options (mature and emerging)
Sound			
Finds it difficult/impossible to hear the audio of TV programmes	Partial or complete hearing impairment (Deaf/Hard of hearing, DH)	Subtitles (SDH)	In-vision (open) or closed. Closed delivered using Teletext or DVB-subtitles. -Pre-recorded or live (using speech to text/ stenography)
		Visual Signing (Deaf Signing (DS))	In-vision (open) or closed. Closed signing delivered using "Picture in Picture", or a separate video stream for signing with the original audio Pre-recorded or live
Finds it difficult/impossible to understand speech in mother tongue	Learning difficulties	Visual Signing (Makaton) Subtitles (may differ from SDH)	In-vision (open) or closed. Closed signing delivered using "Picture in Picture", or a separate video stream for signing with the original audio - Pre-recorded or live - edited subtitles In-vision (open) or closed. Closed delivered using Teletext or DVB-subtitles. - Pre-recorded or live (using speech to text/ stenography)
Sometimes finds it difficult to hear/understand speech in mother tongue	Age or culturally/ educationally-related issues (e.g. young children, adults unfamiliar with slang or fast	Subtitles (may differ from SDH)	In-vision (open) or closed. Closed delivered using Teletext or DVB-subtitles. - Pre-recorded or live (using speech to text/ stenography)

	speech)		
Finds it difficult/impossible to understand speech in a foreign language	Programmes or programme segments not in mother tongue (both imported programming and viewers for whom the national language is not their mother tongue)	Subtitles (translation)	In-vision (open) or closed. Closed delivered using Teletext or DVB-subtitles. - Pre-recorded or live (using speech to text/ stenography)
		Dubbing /lectoring	-Open and Closed (dual language dubbing) - Full dubbing or lectoring. - Pre-recorded or live - lectoring)

Problem	Cause	Solution	Technical options (mature and emerging)
Picture			
Finds it difficult/impossible to see the visual component of a TV programme	Minor or major visual impairment	Audio description (AD broadcast mix)	Pre-recorded as stereo tracks. Pre-recorded as mono track and mixed on the fly to produce stereo tracks during play-out.
		Audio description (AD receiver mix)	Pre-recorded as mono track and played out as private data.
		Audio description (AD - separate transmission)	Pre-recorded and played out on separate transmission system using Medium Wave, DVB-H, DAB, telephone.

Unfamiliar with remote controls and interface conventions on digital television sets / STBs	Modest ICT skills	Television / Set Top Box / Remote Control Devices (RCDs)	Intuitive, consistent user interfaces and WIMPs
Finds it difficult/ impossible to make use of access services such as Subtitles (SDH) or Audio Description	Minor or major visual impairment	Television / Set Top Box	Built-in, intelligent user guides with basics (language) pre-configured
Finds it difficult to switch gaze from screen to remote control device	Cannot accommodate vision without changing glasses	Remote Control Devices (RCDs)	Larger, ergonomic remote control devices; bifocal glasses

Finds it difficult to read subtitles (and other OSDs including EPGs)	Minor visual impairment; low reading speed; dyslexia	User control over font size for OSDs	
		Audio sub-titling	Closed. Audio channel similar to AD receiver mix or Teletext and speech synthesis. Pre-recorded or live.
		Spoken EPG	Closed. TTS using speech synthesis
Mobility			
Finds it difficult/impossible to use the television receiver using a remote control device	Psychomotor impairment (eye-hand coordination)	Audio commands	Speech recognition
		Other controls	Interacting with WIMPs using eye tracking
Getting started			
Finds it difficult/impossible to set up and configure TV set or Set Top Box	Modest ICT skills; modest reading skills	Television / Set Top Box	Built-in, intelligent user guides with basics (language) pre-configured
			Intelligent auto-tuning of STBs and integrated DTV receivers

Appendix 2:

An introduction to access services not originally included in the Description of Work of the project

A2.1 Dubbing

Audiovisual products aimed at children are usually dubbed into the language of the country where is broadcast, since small children cannot read, or have a reduced reading rate. Dubbing is also a common translation practice for audiovisual products in four EU countries: France, Germany, Italy and Spain. In these countries most foreign production is dubbed into their languages.

A2.2 Voice-over/lectoring

Voice-over, also sometimes termed lecturing, is a technique in which a voice offering a translation in a given target language (TL) is heard simultaneously on top of the source language (SL) voice. As far as the soundtrack of the original program is concerned, the volume is reduced to a low level that can still be heard in the background whilst the translation is being read.

It is common practice to allow the viewer to hear the original speech in the foreign language for a few seconds at the onset of the speech and to reduce subsequently the volume of the original so that the translated speech can be inserted. The translation usually finishes several seconds before the foreign language speech does, the sound of the original is raised again to a normal volume and the viewer can hear once more the original speech.

In some EU countries, such as Poland, this technique is favoured over subtitling or dubbing. The technique originated in the former Soviet Union and was brought to Poland, where it still enjoys popularity.

Within Scandinavia, high-end children's fiction (such as the TV series based on Astrid Lindgren's books on Pippi Longstocking and Emil from Lönneberg) made effective use of lectoring as a means to promote an understanding of a language that is neither a true foreign language nor a dialect, but a "neighbour language" - something in between.

Recent changes in children's television have lead to a move away from lectoring in the direction of dubbing, reflecting a decline in the interest for learning such "neighbour languages". However, according to recent research (a poll by Inst. SMG KRC Poland, 2002) 50.2% of Poles prefer voice-over and 43.4% opt for dubbing; subtitling has only 8.1% supporters.

A staggering 72.1% of Poles, when asked which type of AVT was the worst, chose subtitling. The latter is a standard in Polish cinemas (intralingual subtitles seem to be gaining ground on Polish television in documentaries with authentic utterances played back from a low-quality recording, e.g. telephone conversations), and dubbed

cartoons as well as certain commercials are gaining popularity, but documentaries and foreign films for television are voiced-over.

Audio description is only produced in the same language of the audiovisual product. This means that while any home production can be audio described, when the language needs to be translated the scenery changes, and in some cases dramatically.

When the audiovisual product is dubbed, audio description is problem free, in the sense that the translated dubbed programme can be equated to the home produced programme.

When the audiovisual product is voice-over, some care will have to be taken when introducing the band with audio description, in order to minimize the acoustic pollution, since the original soundtrack in foreign language can be heard.

A2.3 Subtitles

When the audiovisual product is subtitled, consideration should be given to the fact that subtitles often greatly reduce or condense the source text message, relying on the recipients' ability to use visual input in order to compensate for condensations and omissions in the subtitles. There are various subtitling traditions within Europe, leading to differences in the extent to which information about the visual input is conveyed in subtitles.

This condensation creates multiple problems of comprehension and coherence for audiences who have no access to the visual mode. Since Audio Subtitles (AST) does not necessarily provide access to the visually conveyed aspects of the overall situation in which the (subtitled) verbal utterances are embedded, this method leaves those with no access to the visual text at a loss in audiovisual content genre such as films, which rely heavily on visually conveyed dramatic action.

There are clear differences from one genre to another. Subtitled films, for example, normally require a combination of AST and Audio Description (AD) to provide the audiences with access to both the subtitled film dialogue and the visual mode, i.e. the actions and scenery in which the dialogue is embedded, and the gestures and facial expressions by which verbal utterances are accompanied. News, on the other hand, can sometimes be described as “illustrated radio” where the key information is found in the commentary and the visual information enhances the spoken word.

How to create a successful AD plus AST for various genres is thus of outmost importance, and it is one of the issues which will be explored within the DTV4ALL pilot project.

ⁱ Toegankelijke Televisie. Verslag van de conferentie Media Park Hilversum, Iv/RDS, Sint Michielsgestel, CGL, Grave.

ⁱⁱ Though some more development had to take place to correct and improve the quality of sound, since the voice was found to be monotonous.