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D6.4 – Pilot-D Evaluation and Recommendations

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D6.4 – Pilot-D Evaluation and Recommendations

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1. Executive summary

Pilot D – *Sign language translation services* of the Hybrid Broadcast Broadband for All (HBB4ALL) project has developed, piloted and tested sign language services in the hybrid broadcast-broadband TV (HbbTV) environment. To meet this challenge partners implemented and deployed solutions to offer customised signing solutions across a number of platforms in different European countries.

This document is the final deliverable of Pilot D and it reports on the sub-pilots carried out during the operational phase of HBB4ALL, their evaluation and outcomes. During the operational phase these services were available on-air and online to allow testing under realistic conditions.

In Germany, RBB deployed a customisable HbbTV-based signing application for catch-up content. It was tested by a panel of 29 deaf users in their households. RBB has deployed customisation options such as signing size, position and layout for different genres (documentary, news and sport). Parameters were tested independently and in combinations. As a result, RBB has elaborated guidelines for the sign language production and guidelines for screen composition in signing application. Both documents are included as annexes in this deliverable. The preferred parameters according to user feedback were: very large or large size and bottom right position.

In Portugal, RTP and UPM has deployed a web-based signing service based on two different web players: VideoJS and JW Player. This implementation has extended the double screen service that RTP was offering just for catch-up content. Both implementations have integrated customisation options: size and position in the case of JW Player and size and composition in the case of VideoJS. This sub-pilot has been open and available on the Internet for "Jornal da tarde". It has been tested by a user group at RTP premises. For both implementations, user preferred a large size to better perceive the facial expressiveness.

UAB has carried out additional user tests in lab conditions to learn more about user preferences and the way users watch sign languages services. UAB has executed two different user tests. The first test included signed audio-visual material with different parameter combinations in terms of interpreter size and position (left/right). This experiment registered the eye movements by means of an eye tracking device. The second experiment tested the avatar signing service for the TV weather forecast developed by VIC in the project, as detailed in previous deliverables.

2. Introduction

The Hybrid Broadcast Broadband for All project (HBB4ALL) investigates accessibility in the new hybrid broadcast-broadband TV (HbbTV) environment. One of the most prominent challenges faced by broadcasters is the new requirement to add access services, in a cost-efficient manner, to Internet delivered audio-visual content while remaining consistent with the access services available on traditional broadcasts. An additional complication is the desire to offer viewers consuming Internet delivered audio-visual content a new opportunity to customise the access services they are using to best meet their personal preferences or needs.

The HBB4ALL project has tested access services in four interlinked Pilots; Pilot-A: Multi-platform subtitle workflow chain; Pilot-B: Alternative audio production and distribution; Pilot-C: Automatic User Interface adaptation – accessible Smart TV applications; Pilot-D: Sign-language translation services. These four interlinked Pilots have been carried out by four concurrent work packages, numbered respectively WP3-WP6. In this way, WP6 has been responsible for Pilot D in HBB4ALL.

The Operational phase of the HBB4ALL project (Task X.3 – Operation Phase for all Pilots A to D) has gathered user feedback and assessed the acceptance and quality of services in various delivery scenarios implemented using field user tests and also in complimentary qualitative lab tests performed by UAB. In the specific case of Work Package 6 / Pilot D, novel sign language interpretation services have been deployed in different HBB4ALL countries, taking advantage of the HbbTV technology and the transmission of video content in IP networks.

Pilot D has deployed two service sub-pilots. On the one hand, an HbbTV-based signing service has been deployed in Germany. On the other hand, a web-based customisable signing service has been deployed in Portugal. Not only are the service pilots on the focus of Pilot D. As in the rest of Pilots, user tests are an important part of work package 6 / Pilot D. The objective of these user tests is to determine the optimal parameters for a high quality service performance. Moreover, these user tests have included an avatar (virtual interpreter) signing service. The creation of this automatic signing service (VIC) for a concrete semantic domain (weather forecast) has been another relevant result of the project and it has been already explained in previous deliverables of work package 6, according to the HBB4ALL working plan (D6.1 [1] and D6.2 [2]).

The four initial objectives of Pilot D / WP6 were:

- **Objective D1** - A prototype version of a complete sign language interpretation production workflow chain for broadcasters which enables basic (HbbTV1.1/1.5) and advanced (HbbTV2.0) customised HbbTV sign language services.

- **Objective D2** - Hbb/IP TV-based sign language services allowing users to customise the size and positioning of sign language interpretation in an overlaid window for large-scale provision and testing in Portugal, Germany (Berlin-Brandenburg), provided by RBB, IRT, RTP, UPM, and UAB.

- **Objective D3** - An HbbTV-based avatar signing service in Spanish provided by Vicomtech allowing users to access Text-to-Signing for content with a well-defined semantic framework such as weather forecasts.

- **Objective D4** - Additional user experience testing of various end user-related aspects of sign language interpretation in the hybrid world involving users from the target groups which will input to work on metrics for the Quality of Service done by UAB.

All these objectives have been fulfilled in the project. This deliverable focuses on objectives D2 and D4 whereas objectives D1 and D3 were detailed in previous deliverables.

2.1. Purpose of the document

This document consists in the final deliverable of HBB4ALL WP6 / Pilot D and it arises from the fusion of two different deliverables previewed in the initial working plan of the project: D6.3 (*Operational Phase results*) and D6.4 (Evaluation and recommendations). The object of creating a unified deliverable was to put together the results of the operational phase and the conclusions and recommendations extracted from such results.

Chapter (executive summary) 1 is focused on providing a quick overview of the content of this deliverable. Chapter 2 consists in an introduction to the deliverable, including sections such as the purpose of the document and clarifications about acronyms and definitions. Chapter 3 is dedicated to the German sub-pilot, deployed by RBB and characterised by the deployment of an HbbTV-based signing service. Chapter 4 is focused on the Portuguese sub-pilot, deployed by RTP and UPM and tested by users in controlled conditions. Chapter 5 details the complementary user tests carried out by UAB. Chapter 6 deals with the ethical and data protection issues, explaining the procedures followed in the project. Chapter 7 and chapter 8 are dedicated to overall conclusions and references, respectively. Finally, chapter 9 gathers annexes.

2.2. Organisation of pilot phase

Pilot D has consisted of two different operational sub-pilots:

- HbbTV-based signing sub-pilot, deployed by RBB in Germany.

- IP/Web-based signing sub-pilot, deployed by RTP and UPM in Portugal.

Moreover, Pilot D has included two additional relevant activities: the creation and test of an avatar signing interpreter (VIC) and the execution of complimentary user tests in lab conditions (UAB).

2.3.Acronyms and abbreviations

In this document, when necessary, identified partners within the project are referred to using the abbreviated names initially defined within the Consortium Agreement for HBB4ALL and reproduced on the cover sheet of this document. Abbreviations and acronyms are introduced in brackets in the text after the corresponding full text version.

2.4.Definitions and glossary

Access Service – the provision of additional services or enhancements that improve the accessibility of TV services for viewers with disabilities or special needs.

Accessibility – The degree to which a product, device, service, or environment is available to as many people as possible. Accessibility can be viewed as the "ability to access" and possible benefit of some system or entity. Accessibility is often used to focus on persons with disabilities or special needs and their right of access to entities, often through use of Assistive technology or Access Services.

Catch-up TV – A service that allows a viewer to see a TV program independent of when it was broadcast. This is usually a kind of on-demand service on the Internet.

CDN – Content Delivery Network. Content repositories especially built to deliver audiovisual content in an efficient manner.

CNLSE – Spanish Sign Language Standardisation Center / Centro de Normalización Lingüística de la Lengua de Signos Española

DVB – Digital Video Broadcasting. European organization that elaborates specifications for digital TV that are used all over the world.

HbbTV – Hybrid Broadcast Broadband TV. Standard technology for Connected TV that supports the HBB4ALL project. HbbTV is a major pan-European initiative building on work in the Open IPTV Forum aimed at harmonizing the broadcast and broadband delivery of entertainment to the end consumer through connected TVs and set-top boxes.

Hearing impairment – is a generic term including both deaf and hard of hearing which refers to persons with any type or degree of hearing loss that causes difficulty working in a traditional way. It can affect the whole range or only part of the auditory spectrum. [For speech perception, the important region is between 250 and 4,000 Hz.] The term ‘deaf’ is used to describe people with such profound hearing loss that they cannot benefit from amplification, while the term ‘hard of hearing’ is used for those with mild to severe hearing loss but who can benefit from amplification.

ILS – International Sign Language

IPTV – Internet Protocol Television

LSE – Spanish Sign Language. The avatar signing interpreter is based on this sign language and it appear widely referenced in this deliverable.

SLI – Sign Language Interpretation

3. Sub-Pilot 1: HbbTV-based signing pilot [RBB]

3.1. Goals of the sub-pilot

The goals of the HbbTV-based signing pilot evolved during the HBB4ALL project. Initially the aim of the sub-pilot was to test a customised hybrid HbbTV application, however this was not possible due problems beyond the control of the HBB4ALL consortium members. The main problem was the lack of HbbTV2.0 devices for testing, developing and deploying purposes. A further set-back for the pilot was the classification of two decoders in HbbTV2.0 devices as not mandatory. Taking real-life events into account the goals of the pilot were defined as following:

- Define and test a workflow for sign language production at RBB
- Develop a signer HbbTV application with customisation setting for screen composition
- Gain more insight into customisation parameters for signer applications in a field trial

3.2. Description of service / application

3.2.1. *Technical implementation*

The German pilot application was implemented as an HbbTV-based signer application (HbbTV v1.0), that enabled users to customise the composition of the TV screen from a set of options. The application then delivered the pre-produced video, corresponding to the chosen setting as a picture-in-picture video. The application itself was hosted by a dedicated webserver.

The application included a configuration file, which allowed an editor to manually adjust the application's pages and buttons, as well as the access to the right video files, all according to the test plan and the actual test patterns.

3.2.2. *Functionalities*

The first screen of the German pilot application informs the user about the aims of each test according to test week. There is also a link to a screen outlining data privacy conditions and policy. The button "Los geht's" leads the user to the test content and settings.

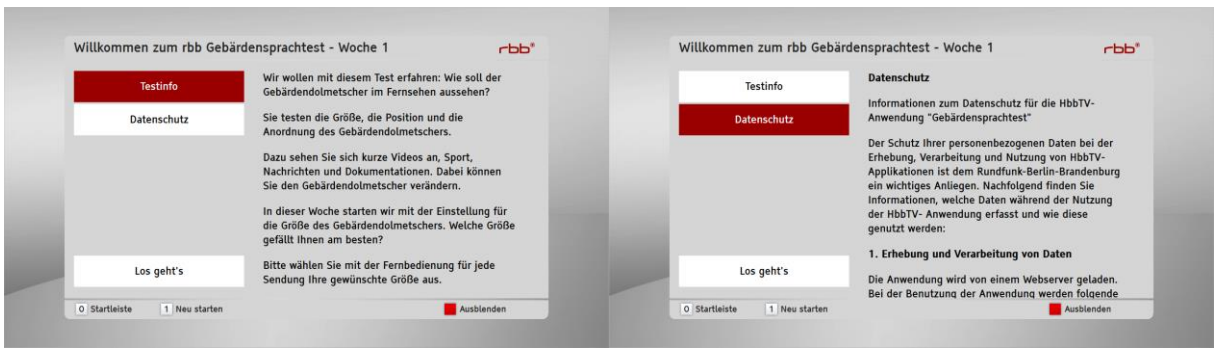


Figure 1. Welcome information and initial instructions in the HbbTV signing application deployed in the German sub-pilot.

In support of the test methodology the application offers video content from three different genres of programmes.

Figure 2. Genre selection in the HbbTV signing application

The selection of one content type immediately starts the default variant of the dedicated video and shows a small overlay menu, to inform the user about his control possibilities:

- Pressing the 1 key of the remote control will re-start the pilot application (see above)
- Pressing ARROW LEFT key will re-start the programmes list (see above)
- Pressing the OK key will open the settings menu

Figure 3. Example of parameter selection

The settings menu enables the customisation of all the video parameters defined in the test plan. The user can chose the parameter that he wants to adapt and the possible options. With the ARROW keys of the remote control the user can switch the parameter in question and by activating the “Schließen und zurück” button the new PiP video variant will be played from the exact chronological position it was left at.

Figure 4. Screenshots of the size menu for the interpreter

3.2.3. *Availability of service*

The service was accessible through a major HbbTV service ("rbb text" teletext), secured by a PIN that was shared with the members of the test panel. The German pilot application was activated as described above on 23 November 2015 and was deactivated on 4th March 2016.

As such, the test service was only available to a closed test group. If a similar service were to become operational at RBB it is likely that it would be offered as either a stand-alone application or integrated into the catch-up TV service Mediathek.

3.2.4. *Intended audience*

The main intended audience is sign language users in the Berlin-Brandenburg. However as an HbbTV service it would have a much wider reach and be accessible to viewers throughout Germany. For the HBB4ALL pilot the service was tested by a dedicated panel of 29 deaf persons.

3.2.5. *Workflow / production aspects*

As there was no technical feasibility to implement a true hybrid signing solution, RBB had to choose a production approach, where the main programme video and the sign language video needed to be merged into one single picture-in-picture video. Thus, a dedicated workflow was set up, described as follows. A more detailed production guideline can be found in Annex 9.7 of this document.

Figure 5. Signing production for the German sub-pilot

A. Recording - A speaker was filmed in front of a green screen, reading text from a teleprompter (fed by re-worked subtitle scripts), while a sign language interpreter synchronised the speaker and the teleprompter tempo.

B. Composition - The recorded signer material and the original programme video were composed (chroma keying) at the mixing desk according the test plan, in the pre-defined variants (sizes, locations, layouts, genres). For every single value or combination one video variant had to be created and encoded.

C. Further processing – The composed video variants had to be transcoded into RBB's web video standards and the files to be renamed according to pre-defined syntax, required by the application configuration, see section 3.2.1. At the end the video files were uploaded to the RBB video management system.

D. Delivery – The video files and variants were deployed as preview in the dedicated HbbTV test application, where a RBB editor checked the video playback, the image quality, the re-named buttons and text fields, as well as the overall test logic according to the test plan. A script was used to publish the checked video combinations.

3.3.Description of user tests

3.3.1. *Aim*

The aims of the user tests in the HbbTV-based signer pilot in Germany were to determine users' screen composition preferences for signers on TV screens in a closed service and to determine if the preferences varied across content genres. A further aim was to develop guidelines on the screen composition of Smart TV signer applications offering customisation options and for videos offering no customisation.

3.3.2. *Methodology*

The pilot was conceived as a field test with three phases, each phase consisted of three test weeks. The aim of the first phase was narrow down the relevant customisation parameters per genre. This was achieved by offering a wide range of parameters per genre and then ranking the users preferences.

In the first phase the following customisation parameters were evaluated independently:

- Size: very large./ large / medium / small

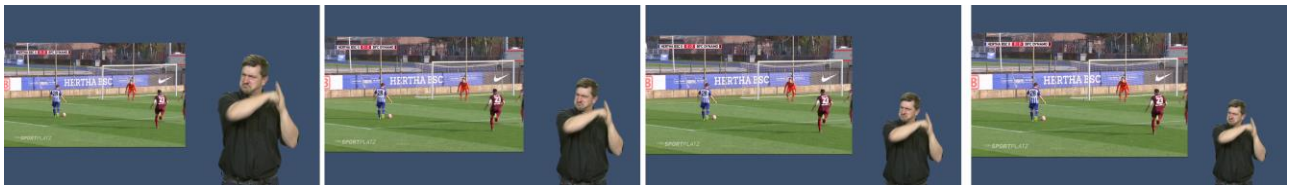


Figure 6. Screenshots of the four options for size

- Position: top left / bottom left / top right / bottom righ

Figure 7. Screenshots of the four options for position

- Layout: TV not rotated, signer not overlapping / TV rotated, signer not overlapping / TV not rotated, signer overlapping / TV rotated, signer overlapping

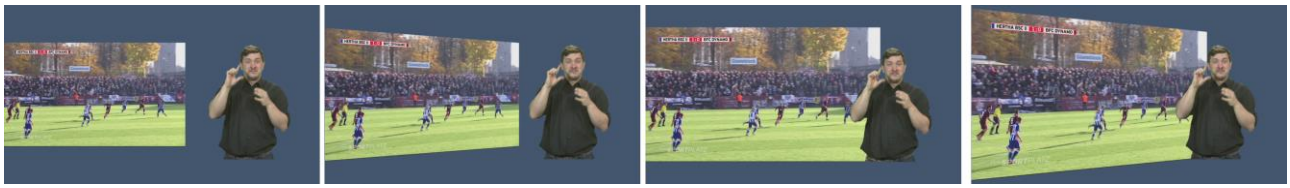


Figure 8. Screenshots of the four options for layout

As these parameters will influence each other in reality, RBB enabled them one after the other on a weekly basis. All were offered for three different content genres, as each has a different visual language users would have potentially different customisation needs or preferences.

The aim of the second phase was to test the combinations of customisation parameters per genre. Following the first round of tests, users' preferences were evaluated and for each genre the least popular options per parameter were removed. In the second round of testing, for each genre a combination of the remaining options per parameter were evaluated by the testers.. For the genres Sport and Documentary the results of the first phase indicated two clear favourites in all three parameters, for News there were two clear favourites for size and position but for layout there was one winner and two options shared second place. The combinations tested in phase two were the following:

Table 1. Combinations tested in phase two

Genre	Size	Position	Layout
Sport	Very large Large	Bottom right Top left	TV not rotated, signer overlapping TV rotated, signer not overlapping
News	Very large Large	Bottom right Top left	TV rotated, signer overlapping TV not rotated, signer overlapping TV rotated, signer not overlapping
Documentary	Very large Large	Bottom right Top left	TV rotated, signer overlapping TV not rotated, signer overlapping

The aim of the third phase was to verify the results from the second phase, i.e. the favoured combination per genre using different content. The options per parameter remained the same as in phase two but for each genre new videos were used.

In each phase the testers completed online questionnaires and forms in their home environment.

Table 2. Test plan for user tests in German sub-pilot

Phase 1 Individual Parameters	Phase 2 Parameter Combination	Phase 3 Parameter Combination
23.11. – 29.11 Size	11.01. – 17.01. Sport	15.02. – 21.02 Sport
30.11. – 06.12. Position	18.01. – 24.01. News	22.02. – 28.02. News
07.12. – 13. 12. Layout	25.01. – 31.01. Documentary	29.02. – 06.03. Documentary

3.3.3. *Testers*

Recruitment

For the tests RBB aimed to recruit 30 deaf testers who used sign language and showed a general interest in improving accessibility services for television. The groups should be as representative as possible, including men and women of differing ages from RBB's catchment area of Berlin and Brandenburg. The testers were required to be at least 18 years old.

To test the service testers needed to access the RBB HbbTV based signer service by starting RBB's HbbTV teletext service and entering a PIN. Potential testers were screened to find out if they could access the service with the TV set they had at home. Testers who could not access the service because they did not have an HbbTV-enabled TV set were provided with an HbbTV set top box by RBB which allowed them access the service.

Testers were recruited via several channels. The local user associations were provided with information about the tests and asked to inform their members. A number of testers were recruited via the RBB tester databank. This is a databank with names and contact details of testers from previous tests. New testers were recruited via RBB website, Facebook page and the RBB booth at the IFA consumer electronics fair, September 2015. Other testers were recruited via online forum and social media groups for the target audience.

Testers

The actual test group recruited consisted of 29 deaf people. Initially 30 testers were recruited; one tester did not return any completed questionnaires and was removed from the evaluation. Thus the final evaluation is based on 29 participants.

Table 3. Sociodemographic characterisation of testers

Age	Percentage of total group	Number of tester
18-24		0 candidates
25-39	31, 03%	9 candidates
40-59	55, 17%	16 candidates
60 and older	10,34, 00%	3 candidates
male/ female	55, 17 / 44, 83%	16 / 13 candidates
Region Berlin/ Brandenburg	55, 17 / 27, 59%	16 / 8 candidates
Other Regions	17, 24%	5 candidates

3.3.4. *Report on test*

Before the tests started, testers were invited to attend a voluntary introductory workshop. At this event, with the support of a sign language interpreter, RBB representatives explained the purpose of the test, how it would run and what the testers needed to do. As the test was not primary concerned with the usability of the HbbTV application the attendees were shown the application and could test it themselves and ask questions.

The test started on 23 November 2015, it ran for 16 weeks and consisted of three phases, as described in section 3.2.3 and 3.3.2. Apart from the introductory workshop communication with the testers was conducted via email.

The high level of participation and the relatively low level of support required by the users imply that the test methodology was well explained and the questionnaires easy to use.

3.4. Analysis of user tests

3.4.1. *Online questionnaire*

To gather feedback from the testers an online questionnaire was created using Google Forms. Each test week the testers were sent an email with a link to the online questionnaire.

Each questionnaire had a similar layout and used simple clear instructions, an example is provided in Section 9.6. It contained screenshots and descriptions of each parameter or parameter combination that was available in that test week and asked the used to choose their favoured combination

Using Google Forms the results of each survey were downloaded, verified and analysed. As the questionnaire required a simple ranking, the analysis process was relatively straightforward. For the first three weeks the results of the individual parameters ranking were correlated and organised by genre. While the results for size and position were clear, for each there were two clear favourites across all genres, the results for layout were not so clear. Both sport and documentary had two favourite options for layout but for news there was one favourite option and two further options shared second place. Based on this result for the combination weeks in phase 2 two parameters were offered for size (very large and large) and two for position (bottom right, top left). For layout we offered the two most favourite options each for sport and documentary and for news we offered the three leading options. The combination test was repeated in phase 3 using the same options but with new content.

3.5. Results and Recommendations

3.5.1. *Recommendations as a result of tests*

When tested independently the results of the user tests were most conclusive for the parameter position, followed by size and less so for layout.

- Tested independent of other parameters and across the three programme genres the vast majority of the test persons (over 72%) preferred to have the signer video positioned at “bottom right” of the screen, the second preference (14% of testers) was “top left” for news and documentary, for sport “top left” and “top right” share second place with 14% each.
- Tested independent of the other parameters and across the three programme genres the majority of the test persons (46 – 55%) preferred to have the sign video size as “very large”, followed closely by “large” (36-46%)
- The results for the parameter layout were the most inconclusive. Globally, when tested independent of other parameters testers seemed to prefer the videos to overlap.

Tested in combinations the results for the parameters correlated with the results above. The results of the user tests indicated that the most important settings for users are position and size, the layout preferences vary according to genre.

For HbbTV signer services with no customisation options we would recommend to adopt the screen composition for the genres news, sport and documentary provided in Table 4.

Table 4. Favourite combination per genre

Genre	Size	Position	Layout
Sport	Very large	Bottom right	TV not rotated, signer overlapping
News	Very large	Bottom right	TV rotated, signer not overlapping
Documentary	Very large	Bottom right	TV not rotated, signer overlapping

For other genres we recommend the screen composition very large, bottom right and an overlap between the TV and signer if the TV picture is not rotated. However as the tests offered no clear consensus on layout, decisions should be based on the importance of the imagery of the TV programme and possible information loss if part of the screen is obscured by the signer or distorted through rotation.

Figure 9. Very large signer, bottom right, and overlapping flat non-rotated video

Figure 10. Very large signer, bottom right beside rotated video

In a service offering customisation the following options per parameter are recommended, regardless of genre.

Table 5. Recommended customisation option for signer services

Parameters	1st Option	2nd Option
Size	Very large	Large
Position	Bottom right	Top left
Layout	TV not rotated, signer overlapping	TV rotated, signer not overlapping

When prioritising the order in which the parameters are presented to the user we would suggest starting with size, followed by position and then layout.

3.5.1.1. Best practice guide for sign language production at RBB

RBB have produced a best practice document for sign language production, based on experience and knowledge gained during the pilot at RBB. The German language document is included in Annex 9.7. The aim of the document is to provide production staff at RBB and other ARD institution with information and tips on the production of signer videos.

3.5.1.2. Guidelines for the presentation of on-screen signer

RBB have produced a best practice document for the presentation of sign language interpreters on TV screens, based on the results of the pilot at RBB. The English language document is included in Annex 9.8. The aim of the document is to inform service producers about the results of the tests and help them in decisions regarding the presentation of sign language on screen.

4. Sub-Pilot 2: IP/Web-based signing pilot – Portugal [RTP /UPM]

4.1. Goals of the sub-pilot

The goals of this sub-pilot were:

- To extend the current live double-screen signing functionality on RTP website to be used in catch-up programmes (the sub-pilot has considered a particular news programme named "Jornal da Tarde").
- To test a first implementation of the service, providing a fully customisable application based on the integration of two player instances in the web interface.
- To validate this approach with a set of real users

4.2. Description of service / application

4.2.1. *Technical implementation (brief overview)*

The application developed for the web-based signer sub-pilot displays two videos, the signer video and the TV video beside each other on one screen.

Based on HTML5 and JavaScript, UPM developed a plugin which allows the RTP video on demand interface (called RTP Play) to present the sign language video in customisable configurations according to users' preferences. The scheme of the system architecture is illustrated in **Figure 11**.

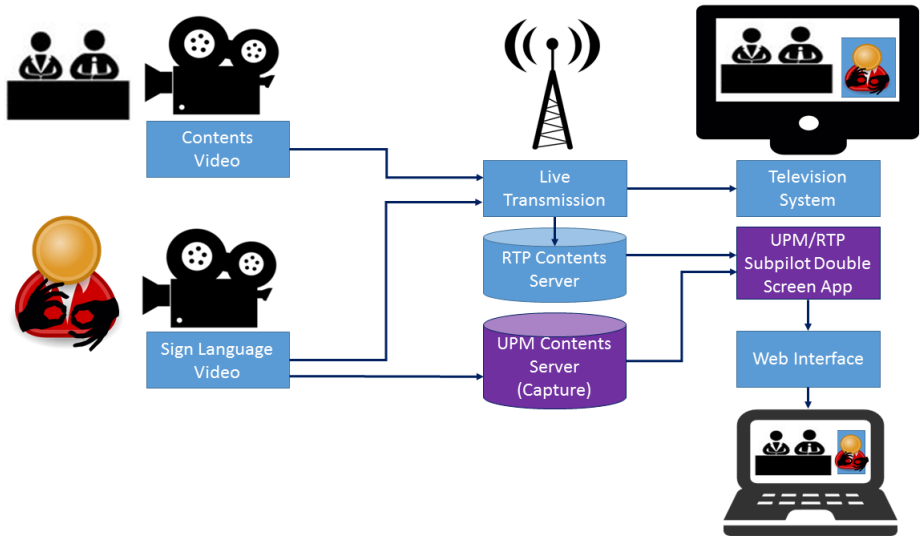


Figure 11. Double screen application working scheme for UPM/RTP sub-pilot

UPM server hosts this sub-pilot. The key piece in this implementation is a web interface that integrates two different players: one for the programme video signal and another one for the signing video signal. Currently, RTP offers this service in its website but just for live content. The objective of the sub-pilot was to test a first implementation to extend this functionality for catch-up TV content

The programme video clip is available by means of a REST API created by RTP. This API includes a set of services to access programmes and information about programmes. On the other hand, the signing video is automatically recorded by UPM when the live programme is delivered. In this way, the signing signal keeps the full resolution and quality.

The web interface joins both signals together, allowing the user to configure a completely customisable service, as shown in the implementation in **Figure 12**.

Figure 12. Screenshot of the user interface

The test interface calls the RTP API REST to collect information about the latest "Jornal da Tarde" television magazine programmes, as shown in **Figure 13**. The sub-pilot application included the 30 the most recent programmes and was automatically updated each day.

Figure 13. Test interface for selection of RTP contents with sign language video

As the sign language video is not recorded and stored as a source by the RTP television, UPM created an application that automatically captured the sign language video to be called up later by the web interface.

4.2.2. *Functionalities*

The implementation provided the double-screen signing functionality for the programme "Jornal da Tarde". This is a daily news programme broadcast by RTP at 13:00 (local time).

The implementation was fully customisable to choose the size of the interpreter window.

UPM developed a solution for the sub-pilot based on the JWPlayer originally used by RTP. After RTP changed from JWPlayer to the new solution VideoJS, also based on HTML and Javascript code, UPM adapted the code developed for the first solution to this alternative, which is more user friendly and more open than the proprietary solution JWPlayer.

The plugin developed in JavaScript language was thus adapted to two different players:

- **JWPlayer**. JWPlayer is a New York based company which has developed a video player software of the same name. The player, for embedding videos into web pages, is used by well-known companies, including ESPN, Electronic Arts and AT&T. It is widely used for self-hosted web videos.

- **VideoJS**. Brightcove is the main sponsor of the VideoJS project, employing many of the core members and investing engineering hours in improving the player and video.js plugins. The Brightcove Player is built on video.js and used on thousands of video websites, ensuring video.js can handle the most professional use cases.

VideoJS Plugin

The VideoJS Plugin allows four different configurations. Depending on the distribution of the video contents window and the sign language video window.

Four configurations are available for the plugin in this

- Configuration 1 presents 2/3 of the screen width dedicated to the video contents, and 1/3 to sign language video, as shown in **Figure 14**. The laterals of the sign language video are cropped for a more efficient distribution of the window.

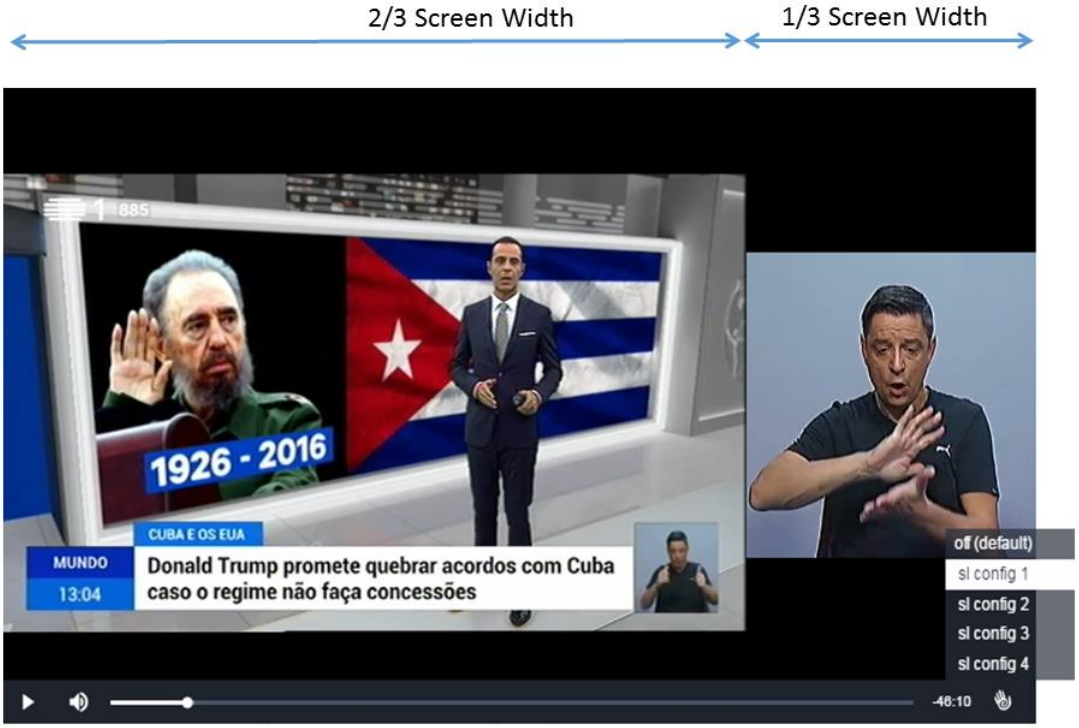


Figure 14. Configuration 1: 2/3 of the screen width is dedicated to the video contents, and 1/3 to sign language video

- Configuration 2 presents 60% of the screen width dedicated to the video contents, and 40% to sign language video, as shown in **Figure 15**.

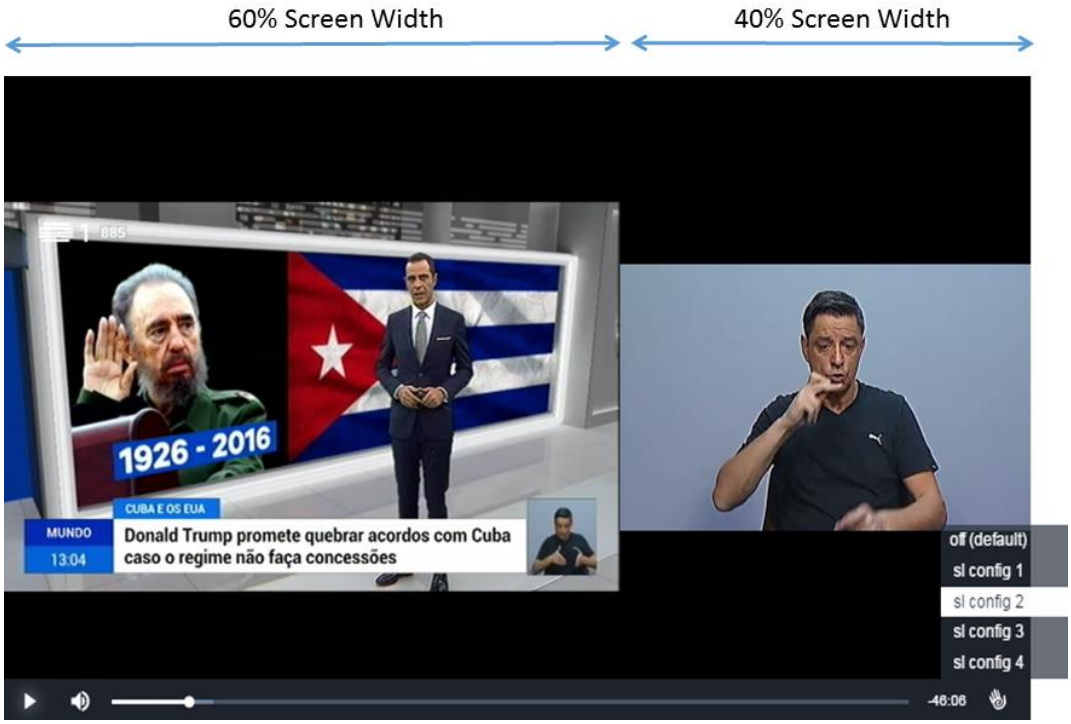


Figure 15. Configuration 2: 60% of the screen width is dedicated to the video contents, and 40% to sign language video

- Configuration 3 presents half of the screen width dedicated to the video contents, and the other half to sign language video with cropping lateral areas, as shown in figure 15.

Figure 16. Configuration 3: Half of the screen width is dedicated to the video contents, and the other half to sign language video with lateral cropping

- Configuration 4 presents half of the screen width dedicated to the video contents, and the other half to sign language video without cropping lateral areas, as shown in **Figure 17**.

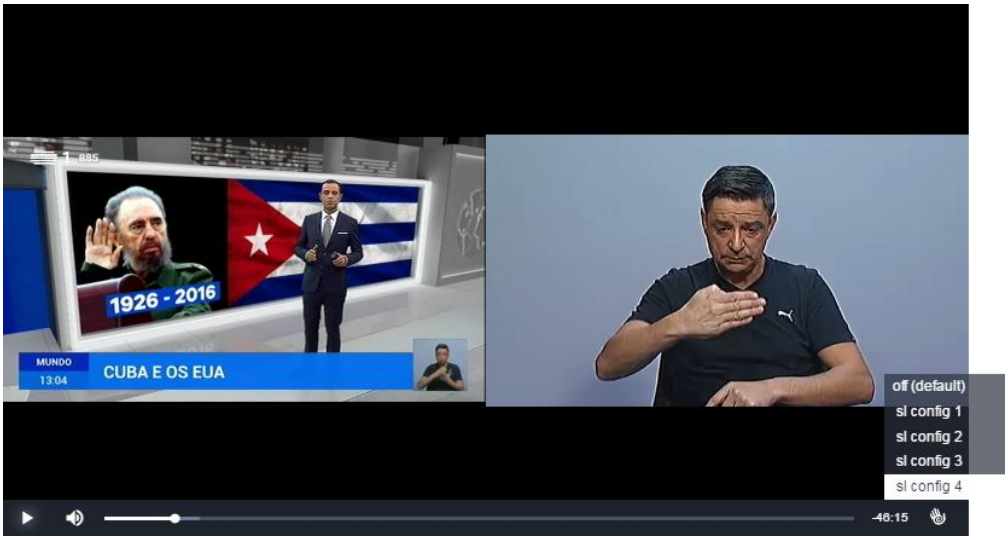


Figure 17. Configuration 4: Half of the screen width is dedicated to the video contents, and the other half to sign language video without lateral cropping

Configurations 1 and 3 present a reduction in effective width of the sign language video for more efficiency in the video content, without losing the aspect ratio, as shown in **Figure 18**.

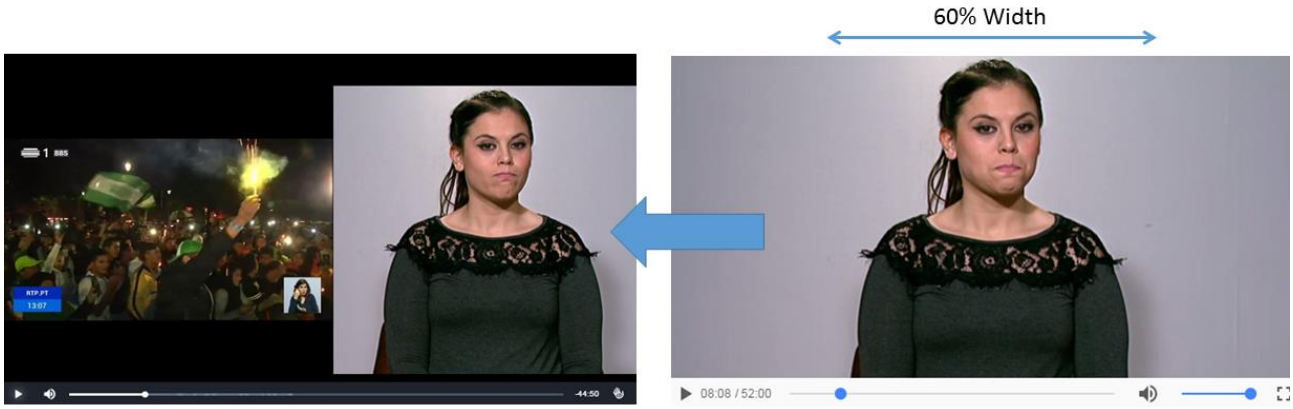


Figure 18. The air is cut for more efficiency in the sign language video

JWPlayer

For JWPlayer, there is only an activation button that coincides with the captions button indicated with the letters CC. Additionally, two buttons for customizing size and position of the sign language video are collected in the upper side of the window, as shown in **Figure 19**.

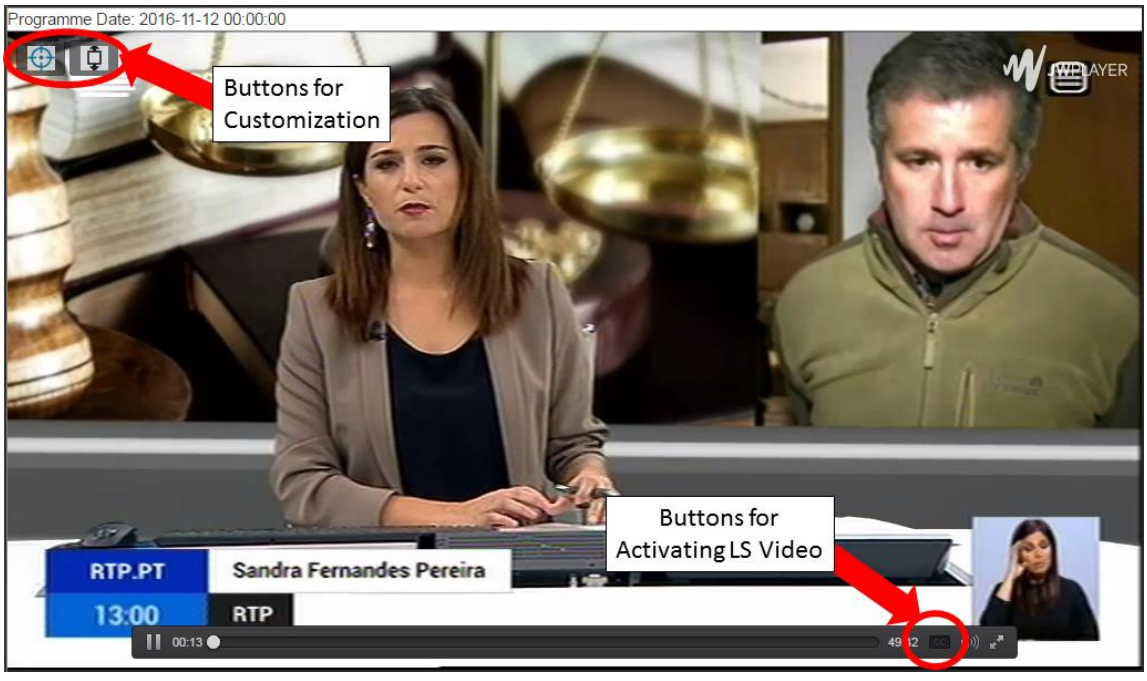


Figure 19. Buttons configuration of the JWPlayer Sign Language Plugin

By default, the sign language video appears on the upper left side of the window, as shown in **Figure 20**.

Figure 20. Video Interface, by default sign language in left upper side

The user can modify the size and position of the sign language video. In this plugin the sign language video always overlaps the video contents, as shown in Figure 21. Four different sizes (1/2, 1/4, 1/8 and 1/16 of the video size) are available. On the other hand, four different positions are available: upper left, upper right, lower left and lower right.

Figure 21. Sign Language video on lower right side, overlapping the video contents

Additionally, it is possible to configure the sign language video overlapping the video content with the same size of the window, as seen in **Figure 22**. This configuration is available for users only interested in the details of the sign language video.

Figure 22. Sign language video with maximum size

4.2.3. *Availability of service*

The service is available on a UPM web server. It does not require any password or pin code. RTP is studying ways of informing potential users about the availability of this service beyond the end of the project. The service is currently available for any person by means of the web interface created in the project. The URLs are:

- http://138.4.47.33:2080/Hbb4all/rtp2.php (for the JW Player implementation)
- http://138.4.47.33:2080/Hbb4all/rtp6.php (for the VideoJS implementation)

The daily automatic recording of "Jornal da tarde" ensures the service will remain available with up-date content even after the end of HBB4ALL.

4.2.4. *Intended audience*

The intended audience is users of Portuguese Sign Language (in Portuguese, Língua Gestual Portuguesa). As the service is publicly available on the Internet, any person can use it.

4.2.5. *Workflow / production aspects*

Since the signing video signal is recorded on UPM servers, the workflow production of RTP has not been affected by the sub-pilot deployment. A simplified schema of the sub-pilot workflow is shown in **Figure 11**, in section 4.2.1. Moreover, it must be taken into account that the generic workflow model for signing service deployment proposed by HBB4ALL was modified in the second year of project to include this kind of implementation (as explained in deliverable D6.2 [2]), which is characterised by an additional organisation (in this case, UPM) being in charge of hosting and providing the service.

4.3.Description of user tests

4.3.1. *Aim*

The aims of the user tests carried out during this sub-pilot were:

- To validate the sign language tools created and deployed in the project for web players.
- To test the suitability of the sign language tools for different types of screen.
- To test the usability of the proposed services.
- To collect feedback about the customisation options to know the settings preferred by users.
- To learn about user preferences in order to deploy more satisfying signing services in the future

4.3.2. *Methodology*

The methodology designed to test the service included two approaches:

- A discussion group to obtain qualitative information about services performance and suitability. For this purpose, RTP invited representatives of the Portuguese deaf people associations. The figure shows a picture taken during the discussion group.
- The availability of the service on UPM servers, conveniently linked in the accessibility area of RTP website, to extend the number of possible users and to get feedback from real users that watch the service at home. This service will continue available after the end of HBB4ALL.

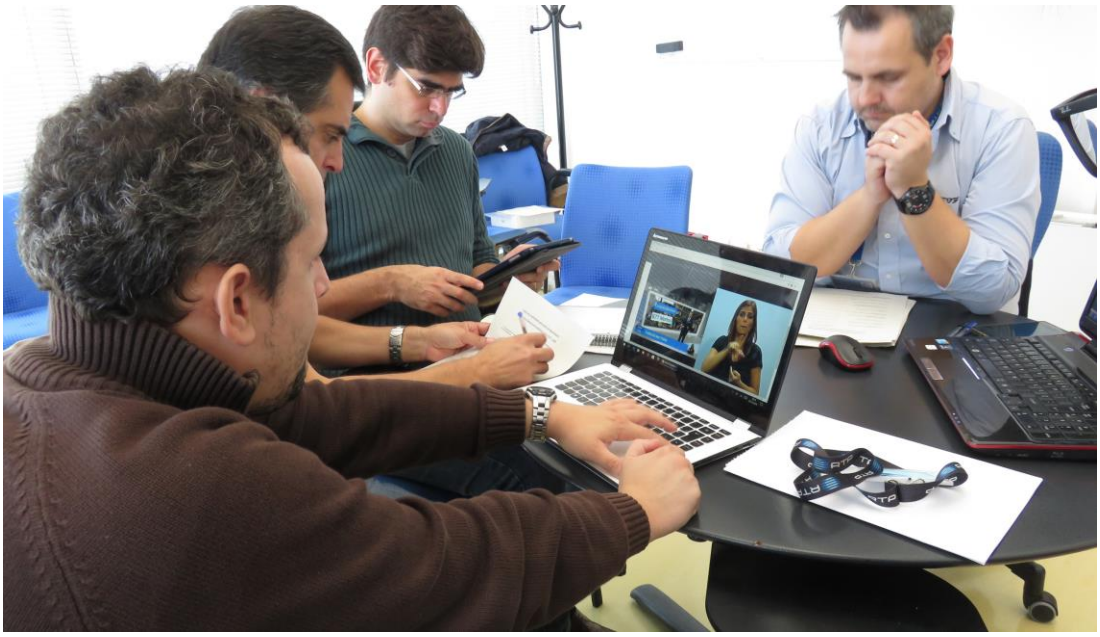


Figure 23. Picture taken during the discussion group. As shown in the image, a laptop was used in the users test session

For the discussion group the following documents were created:

- Informed consent. It was revised and signed by all the participants before the test session. For this purpose, the sub-pilot partners collaborated with UAB.
- SUS questionnaire, to test the usability of the subtitling tool (not the functionality).
- Questionnaire to obtain information about the service, the user preferences concerning customisation options and the opinion of users concerning RTP access services.

These documents were produced in English and then translated into Portuguese. The Informed Consent form was translated from Spanish into Portuguese.

4.3.3. *Testers*

The user tests were carried out in RTP premises on 7th November 2016, from 1 p.m. to 6 p.m. The group of three users, all male, that participated in this user tests session are member representatives of the two major Portuguese associations of Deaf People – Associação Portuguesa de Surdos and Federação Portuguesa das Associações de Surdos. All the users present in the tests session were suggested by their own associations. Two of the three users are profoundly deaf, and one acquired deafness as a child.

4.3.4. *Report on test*

At the beginning of the test session, the main objectives of WP6 and the motivations that led UPM and RTP to develop the application were explained to the users.

Since it was a small group of users a methodology based on a discussion group was adopted. Before the first contact with the technology, the users had the possibility to discuss several issues related to signing, such as the content available in RTP broadcast with sign language, the double screen service available on internet, in RTP accessibilities area, the quality of signing and the difficulties they have in their daily lives to access to Portuguese TV programmes in web context.

As outlined above, the tests were carried out at RTP premises in a controlled environment, and the complete session was conducted in the presence of a sign language interpreter. This ensured all users had the possibility to ask any questions they considered to be important during the session. The users were also informed that the main goal of this session was to evaluate the technology used and not the signing service itself.

Following the introduction, the two players used in the Portuguese sub-pilot, available online, in a UPM web server were presented.

Figure 24. UPM web server interface: news programme "Jornal da Tarde "

In this user test session the interaction of the users with two different players was tested: Video JS and JW Player.

VIDEO JS player:

The first player presented and tested was the Video JS, and the users were asked to interact with it.

Figure 25. Video JS customisation bar

Each one had the opportunity to interact and explore the player. They easily identified the button to activate the sign language service, since the button is represented as one "hand" (as shown in **Figure 25**). Then it was explained to the users that the player had customisation features, such the control of the size of the sign language interpreter interface. After these explanations, the users activated the sign language interpreter, in order to access the options menu.

The users then had the opportunity to explore the player, by changing the size of the signing player, according to their needs.

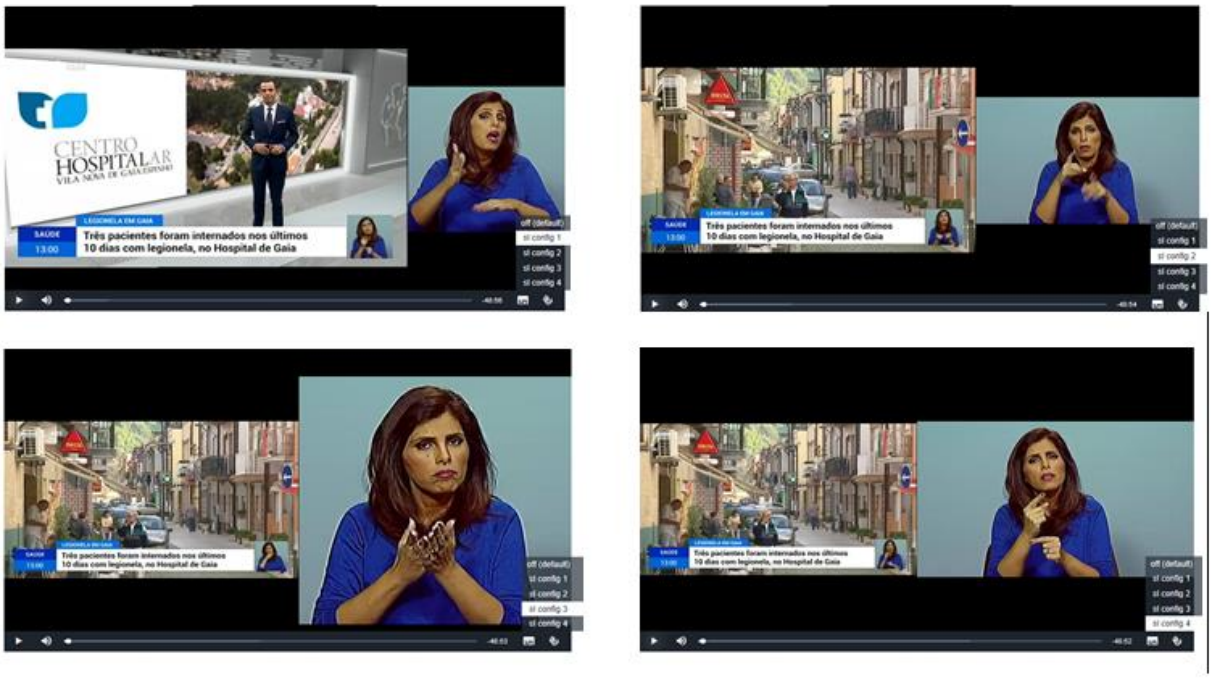


Figure 26. Video JS: 4 customisation options

JW PLAYER player:

The second player presented and tested was the JW Player, and the users were asked to interact with it.

Each user had the opportunity to interact with and explore the player. It was explained to the users that the player had customisation features, such the control of the size and position of the sign

language interpreter interface. In this player, it was explained to the users that the button to activate the sign language service was represented by the CC button, the international code for close captions, and they were also informed that this development was based on a picture-in-picture mode, the same mode used in RTP broadcast.

Figure 27. JW Player: CC and size and position buttons

The users then had the opportunity to explore the player, by changing the size of the signing player, according to their needs.

SL window size: 5 options

Figure 28. JW Player: SL window size - 5 options

SL window position: 4 options

Figure 29. JW Player: SL window position - 4 options

4.4. Analysis of user tests

4.4.1. *SUS questionnaire results*

- Video JS:

SUS - System Usability Scale			
Video JS Sign Language implementation			
	User 1	User 2	User 3
1 I think that I would like to use this system frequently	4	5	4
2 I found the system unnecessarily complex	3	2	4
3 I thought the system was easy to use	5	2	4
4 I think that I would need the support of a technical person to be able to use this system	1	1	5
5 I found the various functions in this system were well integrated	3	4	4
6 I thought there was too much inconsistency in this system	2	2	3
7 I would imagine that most people would learn to use this system	4	3	4
8 I found the system very cumbersome to use	1	2	3
9 I felt very confident using the system	3	5	4
10 I needed to learn a lot of things before I could get going with this system	5	1	4
TOTAL	67,5	77,5	52,5

JW Player:

SUS - System Usability Scale			
JW PLAYER Sign Language implementation			
	User 1	User 2	User 3
1 I think that I would like to use this system frequently	3	4	4
2 I found the system unnecessarily complex	3	3	3
3 I thought the system was easy to use	2	3	4
4 I think that I would need the support of a technical person to be able to use this system	4	2	4
5 I found the various functions in this system were well integrated	2	3	4
6 I thought there was too much inconsistency in this system	2	3	4
7 I would imagine that most people would learn to use this system	2	3	4
8 I found the system very cumbersome to use	2	3	4
9 I felt very confident using the system	2	4	4
10 I needed to learn a lot of things before I could get going with this system	3	2	4
TOTAL	42,5	60	52,5

Figure 30. SUS questionnaire results

According to the results of SUS questionnaires, both implementations have a medium level of complexity, even though the users affirmed that they felt very confident when using this service, and they also assumed that they will be potential users of this system.

Despite their preference for a picture-in-picture system, the testers considered the Video JS player (side-by-side player) more efficient and easier to use.

4.4.2. *Other questionnaire results*

Apart from the SUS questionnaires, the testers were also asked about the functionalities and customisation features available in both players.

Video JS:

- Which is the preferred option?

All the testers pointed out the option 3 as the option preferred, because, in their opinion, this option allows to reinforce the facial expression that they consider to be very important in a sign language interpretation.

Figure 31. Option 3: preferred option for the users

- Would you prefer a different composition (not included in the four options)?

It was unanimous that the users preferred to have the interpreter inside the image rather than in an extra window. This should be done using Chroma key technology and with an outline around the interpreter's body to reinforce the contrast with the image.

JW Player:

- Which is the preferred position and size of the sign language interpreter?

All the testers considered that the interpreter should always be in the bottom right corner of the image (user perspective). All the users pointed out the 1/9 of the screen as the preferred option.

Figure 32. Size and position preferred by the users

4.5. Results and Recommendations

As result of the tests carried out in RTP with deaf users, and based on their opinions and needs, the following points should be considered for sign language services.

- It is important to see the interpreter as a whole and not only the hands of the interpreters. The facial expression should be also considered, because many of gestures only make sense when reinforced by the facial expression. The image of the signer needs to be big enough to allow users see the facial expressions.

- The use of ChromaKey technology improves the quality of service of sign language.

- An outline around the interpreter can be used to reinforce the contrast with the background.

- The visual quality of the signing video in current RTP broadcast emissions is not high. The comparison between the picture-in-picture current service and the signing video signal provided in the sub-pilot reveals a quality gap that could improve if the RTP workflow production in revised.

5. Complimentary user tests

The UAB team carried out the user tests planned in the previous phase (see report D6.2 [2] for reference) of HBB4ALL. Firstly, they performed a user test on screen formats that included the recording of eye movements and secondly, a user pre-pilot test on avatar perception. Both studies are described in the following sections.

5.1. Test on screen formats for SLI

5.1.1. *Aim*

The aim of this experiment was to collect data about the perception of SL interpretation using four different screen configurations: Two sub-screen sizes (Small: 1/8 of the screen, and Medium: 1/3 of the screen) in both screen sides (right/left). In order to study user's perception UAB recorded their eye movements in all the configurations; to assess their information processing UAB applied two questionnaires, one for visual memory and another for verbal memory.

As independent variables we took into account:

- Format (screen configuration), with four categories (Right position/Medium; Right position/Small; Left position/Medium; Left position/Small);
- Clip Number (users watched 4 different clips, as reported in section 5.1.2);
- Order of presentation (1st to 4th position).

5.1.2. *Method*

5.1.2.1. Participants

A sample of 32 deaf users (16 men/16 women) from the metropolitan area of Barcelona participated in this study. Their ages ranged from 17 to 76 years. All of them use Catalan Sign Language to communicate.

5.1.2.2. Material

5.1.2.2.1. Apparatus

- Eye tracker Tobii 60
- Toshiba Portable personal computer to control Eye Tracker
- MacBook Air personal computer to administer and record users' questionnaires.

5.1.2.2.2. Stimuli

Four clips extracted from the documentary "Joining the Dots" (Romero Fresco, 2015) were prepared. Each clip was interpreted by a SL interpreter and edited four times, to generate the different screen formats.

5.1.2.2.3. Other

Three bilingual questionnaires (SL/ subtitles) were prepared with the help of the UPM team to be administered on line. The questionnaires included demographic data, and the verbal and visual memory tests.

5.1.2.3. Procedure

Users were individually evaluated in different local deaf association offices. The participants were first welcomed by one of the researchers and she outlined the test components and objectives. Next, the consent form and the demographics questionnaires were filled.

The interview room had a table and two chairs (one for the interviewer and one for the interviewee). The interviewer had a laptop computer with all the clips and presented them to the participants on a 19-inch computer screen in random order, following a Latin square design. The participants were placed in front of the screen and asked to watch the clips. After each visualisation they answered the memory questionnaires. The whole procedure lasted about one hour per user.

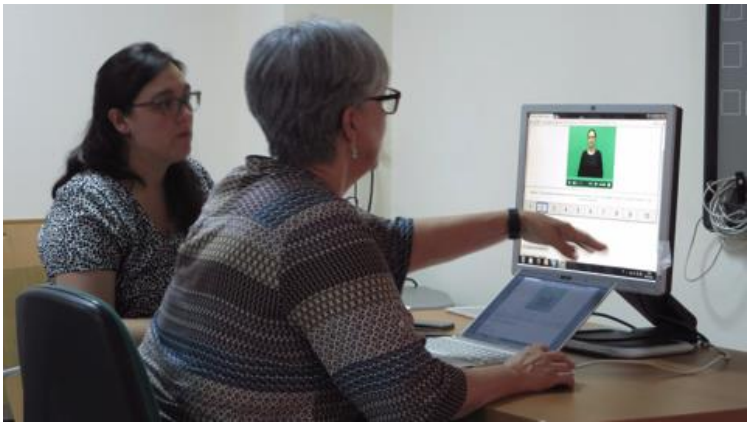


Figure 33. User answers one of the tests with the assistance of the bilingual researcher

5.1.3. *Results*

The data obtained from the Eye Tracker and the memory questionnaires was analysed using a statistics package.

Participants were divided into two age groups (born before/after 1970) but age did not have any effect on any of the analyses performed..

UAB took the following Eye Tracker measures into account to assess the effects of the independent variables listed above:

- Total Visit Duration Mean
- Fixation Count
- Fixation Duration Mean

They defined two areas of interest on the screen: the SL-Interpreter sub-screen and the rest of the screen. They compared the time that users looked at both areas (Total Visit Duration, in seconds) and found out users looked longer into the SL-interpreter sub-screen (97.87 s) than the rest of the screen (49.67 s).

A General Linear Mixed model analysis, with Format as repeated measure and Clip Number and Order of presentation as fixed factors, points out that there are no simple effects due to Format on any of the measures in both areas of interest.

UAB found significant effects of Clip Number for Total Visit Duration Mean in both areas of interest. See Table 6.

Table 6. Means of Total Visit Duration (in s) by to Clip Number, for both areas of interest

	Clip number			
	clip01	clip02	clip03	clip04
Total Visit Duration (SLI screen)	132.0	121.44	73.39	63.93
Total Visit Duration (main screen)	27.37	28.72	79.81	62.23

Clip Number has also an effect on the number of fixations in both areas of interest, as can be seen in Table 7.

Table 7. Total number of fixations by to Clip Number, for both areas of interest

	Clip Number			
	clip01	clip02	clip03	clip04
Fixation Count (SLI Screen)	207	190	126	108
Fixation Count (main screen)	87.57	87.04	172.50	143.04

Finally, Clip Number has an effect on Fixation Duration only in the main screen. Fixations were shorter for Clip Number 01 and 02 (.17 and .20 s, respectively); and longer for Clip Number 03 and 04 (.25 and .29 s, respectively).

Effects of Order of presentation were found mainly on Fixation Duration on the main screen and on the number of fixations also on the main screen.

Table 8. Fixation duration and Fixation Count by Order of presentation, on main screen

	Order of presentation			
	S1	S2	S3	S4
Fixation Duration (main screen)	.25	.23	.22	.21
Fixation Count (main screen)	91.50	119.23	138.46	144.46

With respect the results of Memory tests, Order of presentation had an effect on Visual memory test: participants show a better visual recall of the clip they had seen in last place (S4) (see **Table 9**). No such effects were found on Linguistic memory.

Table 9. Effects of Order of Presentation on the results of both memory tests

	Order of Presentation			
	S1	S2	S3	S4
Linguistic Memory Test	2,23	2,81	2,37	2,37
Visual Memory Test	1,20	1,77	2,20	2,50

The results of both memory tests are different. Linguistic memory is better than Visual memory, although as seen in **Table 9**, Visual memory improves along the vision of the clips.

5.1.4. *Findings and conclusions*

In this study user's visual behaviour while watching video clips in different screen configurations was evaluated. User's eye movements were recorded and afterwards they answered memory questionnaires about the visual and verbal content.

As expected, sign language users spent a longer time watching the SL screen than the rest of the screen, independently of the screen size and the side of display. This led to differences in the memory tests, the answers of the linguistic memory tests being more accurate than the answers of the visual tests.

There appears to have been a learning effect. Once users knew the questions in the memory questionnaires they focussed on the main screen: the number of fixations on the main screen increases from the first watched video to the last; and the number of fixations on the SLI screen decreases. When users became aware of what they were requested to do, they adapted their visual exploring behaviour, looking for the right information. These results can be interpreted as a proof of user's adaptability to the task.

The screen configuration did not appear to have any effect on users' watching patterns. The time of visits to each sub-screen, SLI and Main screen, does not change according to the Format of the

screen. Some clips generated longer visit time, longer fixations, and a larger number of fixations on the main screen. These results are probably due to the different amount of action in the different clips, clip03 and 04 having probably more action to be observed than 01 and 02.

The fact that effects of learning and effects of the action on screen independently of the screen format were found implies that all screen formats tested in this study are suitable for users. That means that the chosen sizes of the SLI sub-screen are both appropriate, and that left and right positions do not make a change users' screen exploration nor perception.

5.2. Sign Language Avatar perception pre-study

5.2.1. *Aim*

The aim of this pre-study was to have a first trial on the evaluation of the user experience when viewing a weather forecast sign-interpreted by the avatar developed by Vicomtech, and to assess the use of the on-line questionnaires in Spanish Sign Language.

5.2.2. *Method*

5.2.2.1. Participants

22 users of Spanish Sign Language (LSE) participated in this study (16 women, 6 men, age from 26 to 54 years). They were recruited with the help of CNLSE and related deaf associations from Madrid area. 13 had a university degree.

5.2.2.2. Material

5.2.2.2.1. Apparatus

- A personal computer with a 20" screen.
- A tablet.
- A mobile phone
- A portable Toshiba computer with a 13" screen, to answer the questionnaires.

5.2.2.2.2. Stimuli

One clip prepared by VICOMTECH. The clip had in the main screen the weather forecast in spoken language and a sub-screen with a signing avatar appeared at the lower right corner (see Figure 34).

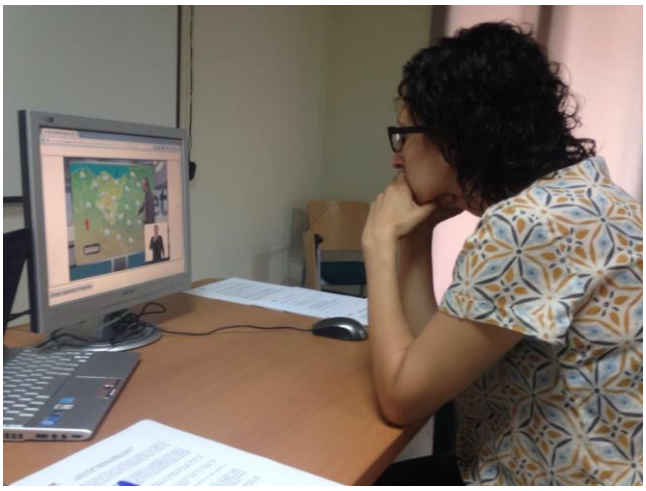


Figure 34. User watches the weather forecast interpreted by the avatar

5.2.2.2.3. Other

A bilingual SL/Spanish subtitles questionnaire on user's experience (13 questions which included preference, experience, comfort with the avatar signing and 8 questions were related to visual and verbal memory).

5.2.2.3. Procedure

The users were interviewed to come to a classroom in the UPM building in Madrid. They filled the demographic data questionnaire and watched the avatar video. After this, they answered the on-line questionnaire.

5.2.3. *Results*

The comparison between different devices cannot be analysed since only one user saw the avatar on the mobile phone, four on the tablet and 17 on the PC.

The provisional results of the questionnaire point out that most of the users had difficulties understanding the avatar (78%). 18 users felt that they had lost information, and 16 qualified their experience with the avatar as "No good". 65% had trouble understanding avatar's signs and 68% did not understand its facial expression.

For memory questions (14 to 21) the most repeated answer was "I don´t know".

5.2.4. *Findings and conclusions*

The results of this study show that the avatar tested is not well accepted by the users. Further developments are needed in order this device can be used to convey information to deaf users.

6. Ethical issues and data protection

6.1. Ethical requirements

The HBB4ALL project carried out tests with humans, as end users, in WP3, 4, 5 and 6. Access services were tested and trialled. Testing with end users was considered one of the project's strengths: the participation of those for who the services are mainly designed. This fulfils the UN CRPD "nothing about us without us"[1].

All tests were designed and complied with the relevant national, EU and international ethics-related rules and professional codes of conduct.

Universitat Autònoma de Barcelona (UAB), HBB4ALL coordinator, has an Ethical Commission on Human and Animal Research to supervise the experimentation on human and animal beings in compliance with the European directives 86/609/CEE, 91/628/CEE and 92/65/CEE. Given that other partners didn't have an Ethical Commission, and given the fact that the UAB commission fulfils all EU directives, it was decided that UAB would seek certificates for all tests.

There were three aspects which were requested permission by all tests:

(i) test design

(ii) informed consent and

(iii) privacy and data protection

In all tests the following issues were respected:

- Tests were planned, implemented and evaluated in a free and independent way.
- Contact with end users was conducted in a respectful way on an equal footing with all users. Especially people who are less competent must have increased attention by the test leaders.
- The tester must be informed honestly and give their consent. The communication must be adapted to the needs of users.
- The tests were anonymous and privacy was ensured.
- A pleasant atmosphere for the user needs was created, so that the test results were as free and objective as possible. To put the users under pressure regardless of the type (time, understanding, empathy) would distort the test results.

Forms used during the project:

[1] http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf

1. Form to request permission (see Annex 9.1)
2. Consent form (see Annexes)
3. Information to participants (see Annexes)

6.2. Data protection

All data was anonymized. Also in HBB4ALL we took on board EU data protection policies following the European Directive 95/46 with date 24/10/1995, and also local policies such as the German Federal Data Protection Act (BDSG) or the Spanish Ley Orgánica de protección de datos 15/1999, and the different countries where tests were performed. Data was stored in an internal UAB server.

6.3. Sub-pilot specific issues and measures

In addition to these general measures, following sub-pilot specific measures were taken.

All information about the German user tests were provided in writing. See examples of forms in Section 9. In addition, the testers that attended the voluntary introductory session received information about the purpose of the experiment and what information would be gathered and how it would be analyses. This information was translated in sign language by a professional signer.

The forms used in the Portuguese sub-pilot were read to the users in a group situation

- Aware of the experiment and have enough information to do the tests;
- Aware of the fact that their participation was completely voluntary and their personal information will be kept in anonymity;
- Aware that they had the opportunity to interrupt their participation at any time by their own will without any kind of loss for them.
- It also included a point concerning the use of pictures/photographs of the session tests in future publications (such as this deliverable or any other publication related to the project).

The forms were signed by each user and RTP and UPM representatives.

7. Conclusions

The sub-pilots and the activities carried out in Pilot D show how broadcast and broadband networks can cooperate to offer better and more satisfying services for users. This is one of the key aspects of HbbTV, the main technology in HBB4ALL.

The results of the user tests carried out by RBB indicated that the most important settings for users are position and size, the layout preferences vary according to genre. These conclusions are consistent when comparing results of parameters independently tested and results of combination of parameters. The majority of the test persons preferred to have the signer video positioned at “bottom right” and to have the sign video size as “very large” or "large".

Results in the Portuguese sub-pilot deployed by RTP and UPM show the importance of facial expressiveness to an actual comprehension of sign language interpretation service. For this reason, users preferred a large size for the sign window. The preferred position is the right side of the screen. This is the position traditionally used by RTP to provide the service in the picture-in-picture broadcast modality. Users underlined the availability of customisation option as a relevant added value for the service provision.

UAB additional user tests show that sign language users spent a longer time watching the SL screen than the rest of the screen, independently of the screen size and the side of display. This led to differences in the memory tests, the answers of the linguistic memory tests being more accurate than the answers of the visual tests. Concerning tests on the avatar signing application for a concrete semantic domain (weather forecast), this service was not seen as a quality option by users. Further technological developments are needed to have feasible virtual interpreters.

8. References

[1] D6.1 - Pilot-D Progress report, HBB4ALL deliverable, December 2014. (http://www.hbb4all.eu/wp-content/uploads/2015/03/D6.1-Pilot-D-Progress-Report.pdf)

[2] D6.2 - Pilot-D Solution Integration and Trials, HBB4ALL deliverable, October 2015. (http://www.hbb4all.eu/wp-content/uploads/2015/03/D6.2-Pilot-D-Solution-Integration-and-Trials-2015.pdf)

9. Annexes

9.1.Form to Request Permission

The following internal HBB4ALL form was sent to all partners requiring Ethical Commission approval, and it was then sent to UAB commission for approval. The form has the questions in Catalan but the replies are in English.

Títol Hybrid Broadcast Broadband for All

Breu descripció del projecte (3500 caracters)

The project HBB4ALL addresses media accessibility possibilities in the new hybrid broadcast-broadband TV (HbbTV) environment. To turn the accessibility vision into reality, Hbb4All will address all relevant stakeholders and all components of the value chain. One of the prominent challenges of the coming years will be the multi-platform delivery of audio-visual content (anytime, anywhere, any device), be it a broadcast or an Internet service. Hybrid delivery platforms such as connected TVs and two-screen solutions enable a cost-efficient and convenient delivery of access services for those who need them. The elderly and people with various disabilities rely on subtitles, Audio Description, dialogue enhancement or sign interpretation. Customizing to personal preferences shall be possible within predetermined limits. The HBB4ALL project builds on HbbTV (from the existing versions 1.1.1 and 1.5 to the version 2.0 that is currently in development) as the major European standard for converged services and looks at both the production and service side. HbbTV provides a straight-forward specification on how to combine broadcast and broadband content plus interactive applications.

The project will test access services in various pilot implementations (from the definition to the operational phase) and gather implicit and explicit user feedback to assess the acceptance and the achievable quality of service in the various delivery scenarios.

HBB4ALL is elaborating pertinent guidelines, guides of good practice, metrics, and recommendations and will initiate campaigns to promote the project results. The results of HBB4ALL will be of worldwide relevance and will, through standardization bodies such as the ITU, also be publicized on a world-wide level. The overall objective of HBB4ALL is to become a major platform/player in the e Inclusion economy currently taking place, fostering the future market take-up while satisfying the diverse interests of all societal groups.

Area del procediment Antropologia

Objectius del procediment d'experimentació amb humans (3500 caracters)

Descriure els principals objectius que es pretenen assolir amb la realització d'aquest procediment d'experimentació

The objective of the user tests carried out in this project is to obtain quantitative and qualitative information about user's preferences and experience regarding accessibility services such as subtitling, Audio Description and Sign Language Translation.

The information gathered from users will be used to various ends:

- to determine the optimal parameters for the user's information processing
- to provide feedback to project partner's in order to customize and adapt existent accessibility technologies according to user's recommendations.
- to establish quality standards and guidelines for the presentation of different accessibility technologies to the public.

Archivo: No (Els fitxers adjunts han de ser com suport. Mai per substituir el text principal. Tots els documents han d'estar en format PDF)

Metodologia del procediment d'experimentació **(3500 caracters)**

Descriure breument la metodologia emprada justificant les dades, mostres biològiques i o respostes conductuals obtingudes de les persones sota experimentació

The general procedure of the user tests in this project is to present audiovisual content to the users such as films, clips or audio files, and verify user responses to a number of variables.

In order to do this, several qualitative and quantitative techniques are taken into account, namely administration of questionnaires, focus groups or interviews. Where needed, data will be recorded during the visualization phase (i.e. eye movements or time needed to perform a certain task).

Also, users will be required to perform certain actions like activating accessibility services (for example, activating subtitles or Audio Description) following previous instructions from the researcher.

Since this is a project aimed at addressing the needs of all the population, apart from people with no impairments, among the users there will also be the elderly and persons with hearing or vision loss. If a participant with a particular impairment needs assistance, a personal assistant will help him/her to perform the task in a given study. The participants with hearing or visual impairments will be recruited via official channels, i.e. by sending information to associations and institutions concerned with actions devoted for deaf and hard of hearing persons and blind and partially sighted persons and inviting them to our studies.

Before each actual test, a demographic questionnaire will be administered to gather background information on the participants.

Archivo: NO (Els fitxers adjunts han de ser com suport. Mai per substituir el text principal. Tots els documents han d'estar en format PDF)

Informació a les persones participants

S'annexa un full d'informació del projecte de recerca que inclou de forma entenedora els objectius de la investigació, els investigadors/res responsables i la forma d'obtenir fàcilment més informació?

Si.

Adjuntar Archivo: (veure al final)

S'annexa un full de consentiment informat signat per l'investigador/a i la persona en qüestió on queda clarament expressat que la participació és voluntària, que es podrà retirar en qualsevol moment sense donar explicacions, que disposa de la informació suficient i que en el cas d'estar sota tractament aquest no es veurà afectat de cap forma?

Adjuntar Archivo: (veure al final)

Compensació

Està previst algun tipus de compensació per la participació en el projecte?

No

Gestió i emmagatzematge de les dades obtingudes

Està prevista l'anonimització de les dades obtingudes?

Si

Està previst l'emmagatzematge de les dades en un servidor segur?

Si

Data collected in the course of the study will be stored on the Nebula server. Nebula is the space for collaborative work on documents as well as a repository for documents.

Feedback

Està prevista alguna forma de feedback a les persones participant un cop finalitzat el projecte?

Si

The participants will be given access to the project reports and academic articles produced in relation to the study.

Name of the project: HBB4ALL. Hybrid Broadcast Broadband for All

Aim of the tests

Methodology

Contact person

Forms were filled in in the many EU languages used for the tests: English, German, Polish, Italian, and Spanish.

9.2. Consent form used in Portuguese sub-pilot

DECLARAÇÃO DE CONSENTIMENTO

RTP (Rádio e Televisão de Portugal) e UPM (Universidad Politécnica de Madrid)

NOME DO PROJETO

HBB4ALL. Projeto de investigação sobre tecnologias de acessibilidade para dispositivos desenvolvidos segundo as normas padrão para HbbTv.

DESIGNAÇÃO DO ESTUDO

Teste de utilização e eficácia para a configuração de sistemas de legendagem e interpretação em língua gestual no sítio de internet da RTP

DESIGNAÇÃO DO GRUPO DE INVESTIGADORES

Transmedia Catalonia, RTP e UPM

CONSENTIMENTO

- Declaro ter lido e compreendido a informação disponibilizada sobre a experiência, e tive a oportunidade de fazer as perguntas que julguei necessárias;
- Tive conhecimento de que a minha participação na experiência é voluntária e que os meus dados pessoais se manterão sempre sob anonimato;
- Os resultados obtidos no presente estudo poderão ser utilizados na elaboração de material académico relacionado com este projeto e na apresentação final à Comissão Europeia;
- Autorizo a realização de fotografias durante a sessão de testes, para documentação futura do projeto;
- Declaro que tive conhecimento de que posso suspender a minha participação a qualquer momento e sem justificação prévia, sem que isso tenha qualquer repercussão adicional.

Nome do participante:_____
Assinatura do participante (ou representante): _____
Assinatura(s) do(s) investigador(es):_____

Data: _____

9.3. Information form for participants in Portuguese Test

INFORMAÇÃO AO PARTICIPANTE

HBB4ALL. Projeto de investigação sobre tecnologias de acessibilidade para dispositivos desenvolvidos segundo as normas-padrão para HbbTv.
O objetivo do projeto HBB4ALL é o de estabelecer normas de qualidade para a disponibilização de tecnologias de acessibilidade para o utilizador final. Estas tecnologias incluem: legendagem, audiodescrição e interpretação em língua gestual.
Para isso, serão realizados diversos estudos nos quais se pretende estabelecer boas práticas na produção de conteúdos fílmicos. Desta forma, pretende-se melhorar a usabilidade destes serviços e permitir que todas as pessoas possam aceder aos serviços de acessibilidade oferecidos pela norma HbbTv.

Testes de usabilidade e eficácia na configuração de sistemas de legendagem e interpretação em língua gestual no sítio de internet da RTP
Este estudo pretende analisar o nível de aceitação e de usabilidade da aplicação desenvolvida pela RTP/UPM para o projeto HBB4ALL.

PARTICIPAÇÃO VOLUNTÁRIA

A participação neste estudo é completamente voluntária, podendo ser interrompida a qualquer momento se o participante assim o desejar. Os resultados obtidos são absolutamente confidenciais e serão utilizados exclusivamente em publicações científicas relacionadas com o projeto em que se enquadram.

EQUIPA DE INVESTIGAÇÃO
A equipa de investigadores responsáveis por esta experiência pertence à RTP e UPM.

Contactos: mario.sequeira@rtp.pt
cam@gatv.ssr.upm.es

RTP – Rádio e Televisão de Portugal
Avenida Marechal Gomes da Costa, n.º 37
1849-030 Lisboa Portugal

9.4. Consent form used in German sub-pilot

Datenschutzerklärung

Ich bin damit einverstanden, dass meine Daten gespeichert werden.

Die **rbb** Innovationsprojekte speichern die Daten für die gesamte Testphase des Projektes bis zum Ende der Auswertung im August 2016.
Danach werden die Daten gelöscht.
Die Daten werden anonymisiert.
Die Daten werden nur im Rahmen der Auswertung weitergegeben.

Bei einem vorzeitigen Ausstieg aus dem Projekt werden meine Daten gelöscht.

Ich als Tester/Testerin kann mein Einverständnis für die Speicherung der Daten schriftlich widerrufen.

Rundfunk Berlin-Brandenburg
Innovationsprojekte
Marlene-Dietrich-Allee 20
14482 Potsdam

Eine weitere Teilnahme an dem Test ist in diesem Fall nicht mehr möglich.

Mit der Vereinbarung zum Datenschutz bin ich einverstanden.

Ort, Datum:

……

……

……

……

Vorname und Nachname Unterschrift

9.5. Information for participants of German sub-pilot

RUNDFUNK BERLIN-BRANDENBURG

RBB MARLENE-DIETRICH-ALLEE 20 14482 POTSDAM

rbb

Innovationsprojekte der
rbb Produktions- und
Betriebsdirektion
23.11.2015

TELEFON +49 331 97 99 3 - 50 065
TELEFAX +49 331 97 99 3 - 50 049
E-MAIL innovationsprojekte@rbb-online.de

Liebe Testerinnen und Tester,

schön, dass Sie beim **rbb**-Gebärdensprachtest dabei sind.

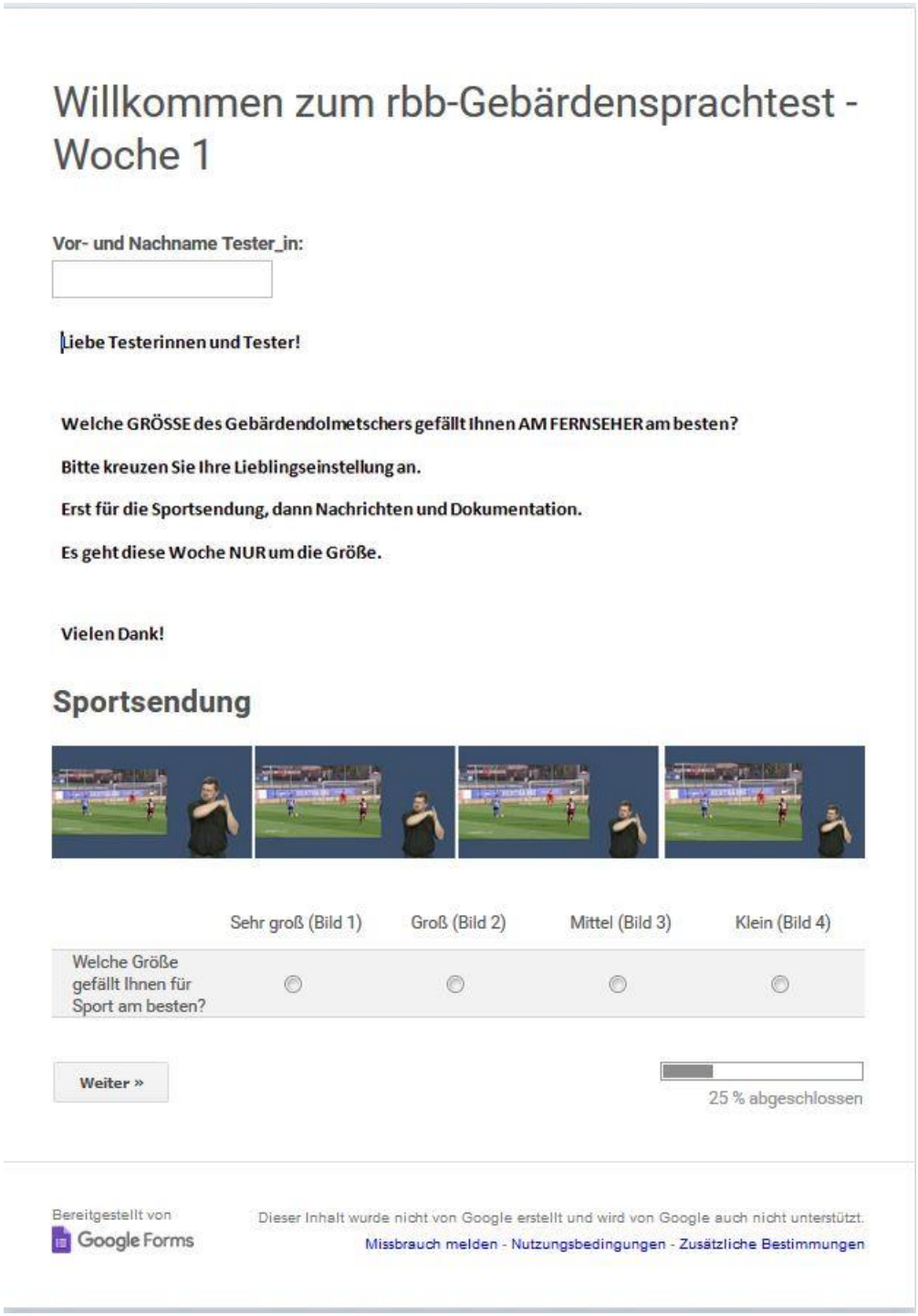
Wir wollen mit diesem Test erfahren:
Wie soll der Gebärdendolmetscher im Fernsehen aussehen?
Welche Einstellung gefällt Ihnen am besten?
Sie testen Größe, Position und Anordnung für **rbb** Sport-Sendungen, Nachrichten und Dokumentation.

Der Test dauert insgesamt 15 Wochen. Er läuft bis Ende Februar 2016. Es gibt 2 Pausen. Die erste Pause dauert 3 Wochen ab Mitte Dezember (Weihnachtsferien). Die zweite Pause dauert 2 Wochen ab Anfang Februar (Winterferien). Sie erhalten für den Test eine Aufwandsentschädigung von 100 EUR.

Wir senden Ihnen nun auch eine Settopbox zu. Die schließen Sie bitte an Ihren Fernseher an. Beigefügt finden Sie eine genaue Anleitung für den Aufbau der Box. Falls Sie Fragen haben, wenden Sie sich bitte an unseren Projektingenieur Sven Glaser, Email: sven.glaser@rbb-online.de.

RUNDFUNK
BERLIN-BRANDENBURG
MARLENE-DIETRICH-ALLEE 20
14482 POTSDAM
TELEFON +49 331 97 99 3 - 0
TELEFAX +49 331 97 99 3 - 19
WWW.RBB-ONLINE.DE

9.6. Online questionnaires from German sub-pilot



Willkommen zum rbb-Gebärdensprachtest - Woche 1

Vor- und Nachname Tester_in:

Liebe Testerinnen und Tester!

Welche GRÖSSE des Gebärdendolmetschers gefällt Ihnen AM FERNSEHER am besten?

Bitte kreuzen Sie Ihre Lieblingseinstellung an.

Erst für die Sportsendung, dann Nachrichten und Dokumentation.

Es geht diese Woche NUR um die Größe.

Vielen Dank!

Sportsendung

	Sehr groß (Bild 1)	Groß (Bild 2)	Mittel (Bild 3)	Klein (Bild 4)
Welche Größe gefällt Ihnen für Sport am besten?				

Weiter »

25 % abgeschlossen

Bereitgestellt von Google Forms

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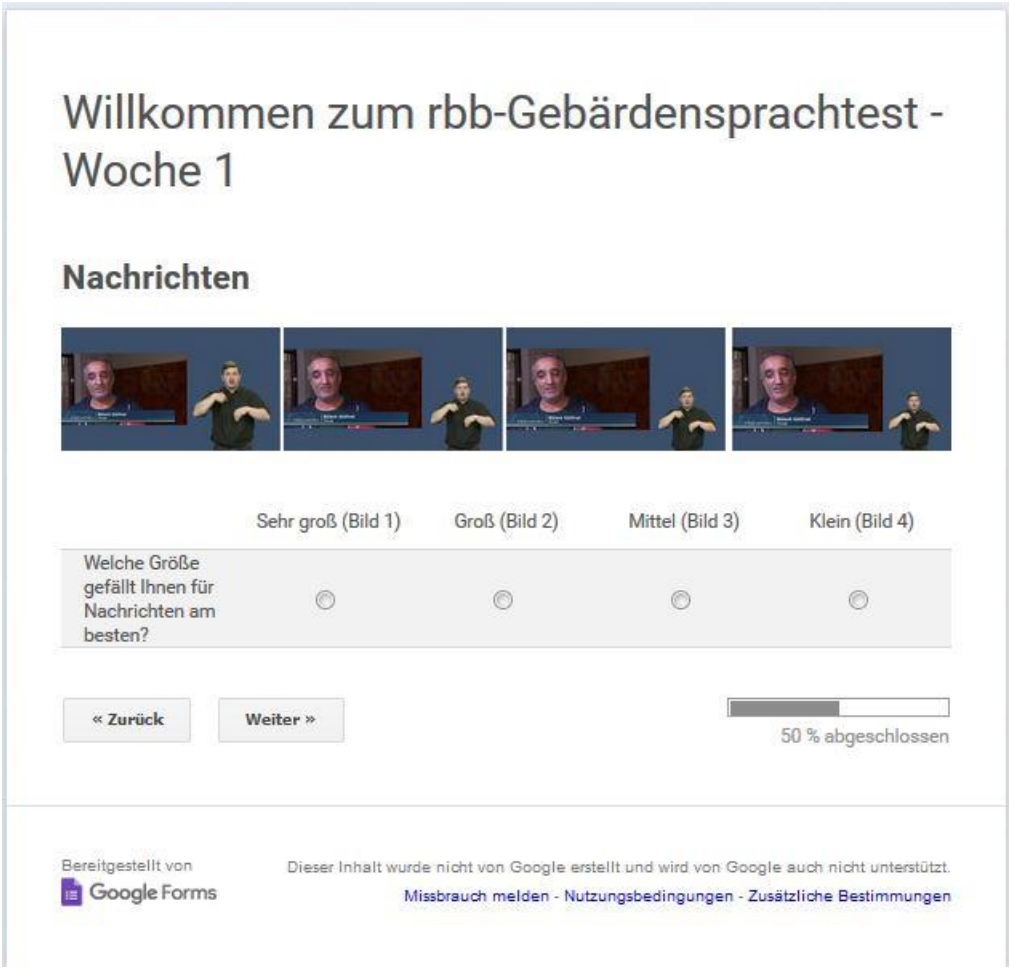
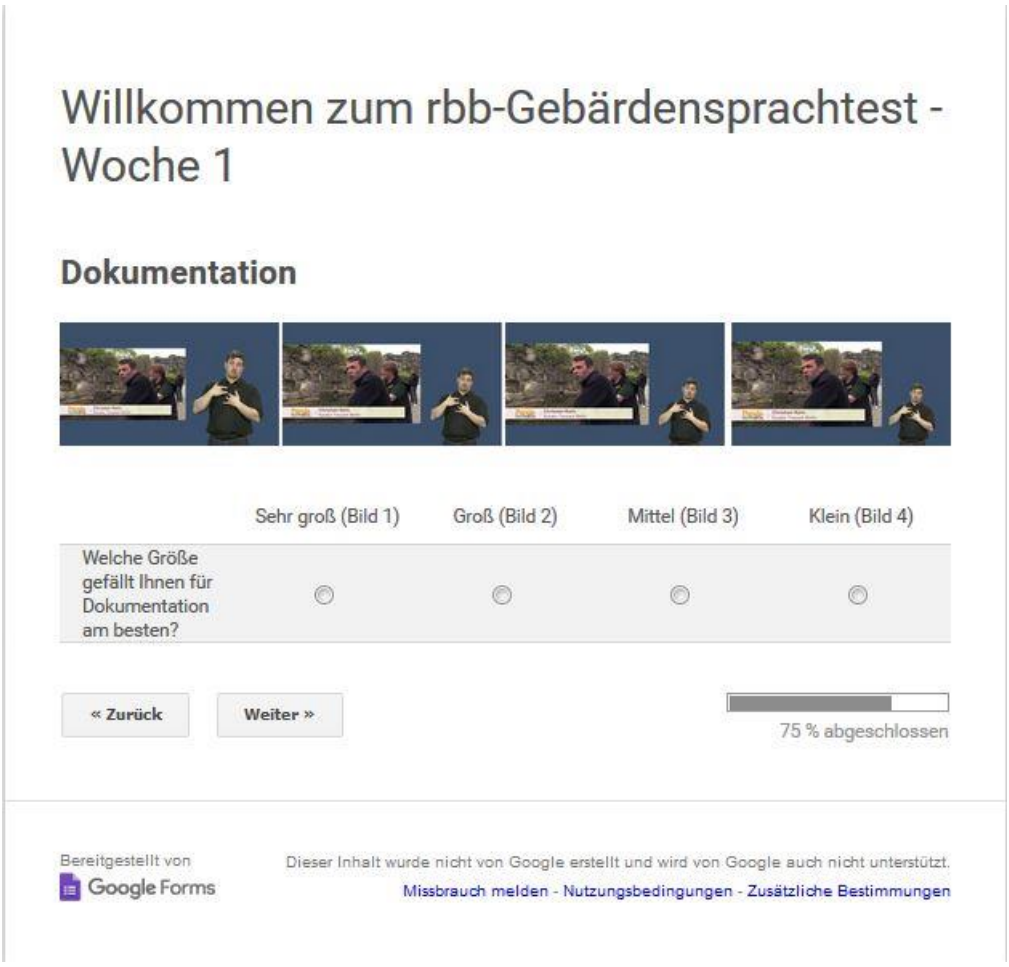
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen


Willkommen zum rbb-Gebärdensprachtest - Woche 1
Nachrichten
Sehr groß (Bild 1)
Groß (Bild 2)
Mittel (Bild 3)
Klein (Bild 4)
Welche Größe gefällt Ihnen für Nachrichten am besten?
« Zurück
Weiter »
50 % abgeschlossen
Bereitgestellt von
Google Forms
Dieser Inhalt wurde nicht von Google erstellt und wird von Google auch nicht unterstützt.
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen


Willkommen zum rbb-Gebärdensprachtest - Woche 1
Dokumentation
Sehr groß (Bild 1)
Groß (Bild 2)
Mittel (Bild 3)
Klein (Bild 4)
Welche Größe gefällt Ihnen für Dokumentation am besten?
« Zurück
Weiter »
75 % abgeschlossen
Bereitgestellt von Google Forms
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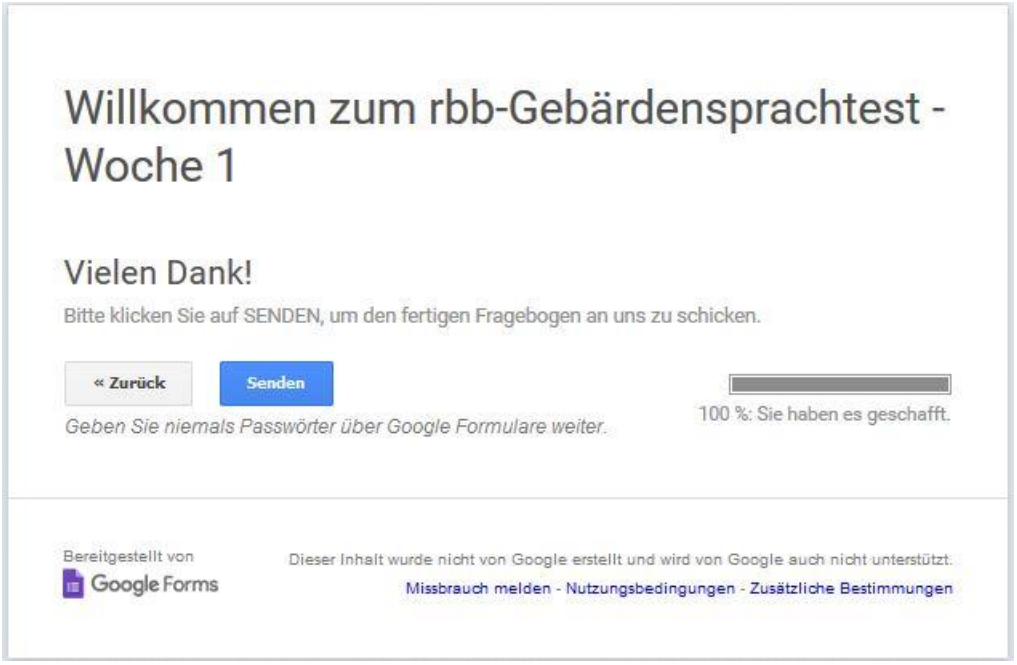
Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen


Willkommen zum rbb-Gebärdensprachtest - Woche 1
Vielen Dank!
Bitte klicken Sie auf SENDEN, um den fertigen Fragebogen an uns zu schicken.
« Zurück
Senden
Geben Sie niemals Passwörter über Google Formulare weiter.
100 %: Sie haben es geschafft.
Bereitgestellt von
Google Forms
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Missbrauch melden - Nutzungsbedingungen - Zusätzliche Bestimmungen

9.7.Sign Language production at RBB - Best Practice

Guidelines for screen composition in HbbTV sign language applications
Authors: Annette Wilson, Sven Glaser, Bettina Heidkamp

Introduction
Emerging technologies such as HbbTV open up new possibilities for broadcasters to offer sign language services. Not only can sign language be offered as a closed service, i.e. the viewer can choose to turn it on and off, similar to closed subtitles, there is also scope to offer the viewer customisation options.
The following guidelines contain recommendations for the screen composition in SmartTV signer applications. They cover the parameters size, position and layout of the signer video in relation to the TV video.
The recommendations are the result of user tests conducted by public broadcaster RBB in the European Commission funded project on accessibility Hybrid Broadcast Broadband for All (HBB4ALL).
A closed signer solution requires a screen composition where the TV video and the signer video are positioned in relation to each other. While a slight overlap of the videos may occur both should remain visible. The tests conducted by RBB set out to investigate users' preferences in terms of the position of the signer video and the size of signer video relative to the TV video; a larger signer video implies a smaller TV video. A further consideration was users' preferences in terms of the layout of the two videos which can allow overlapping and/or rotation of videos. The user tests also addressed the issue of whether customisation preferences varied across content genres.
Guidelines applying to the production of signer videos exist and are helpful, such as those from the National Disability Forum, Ireland . However they are not very detailed in terms of the presentation of signer video in relation to the TV video. There are guidelines for web applications but they cannot be applied directly to the TV screen.
At the end of this document we have provided a non-exhaustive list of guidelines and references related to sign language production.

Scope of Guidelines
The recommendations in these guidelines apply to the following services:

- Closed signer services for broadcast TV content offering customisation options.
- Closed signer services for broadcast TV offering no customisation option.
- Closed signer services for HbbTV catch-up TV content.

The recommendation can also be considered for open signer services for broadcast and catch-up TV content.
The recommendations are the result of tests using pre-recorded content but should also be considered for live broadcasts.
The recommendations apply to news, documentary and sport programmes but can also be considered for further genres.
The recommendations apply to signer videos using Chroma Key technology, where the signer video is presented in relation to the TV video.

Determination of the selected parameters and options

To determine the most relevant customisation options for signer services, in addition to reviewing existing guidelines, RBB compared current open signer language services in Germany such as "MDR um 11", "Tagesschau" or "Kontraste

"MDR um 11" with signer beside rotated TV video

"Tagesschau" with overlapping signer and rotated TV video

"Kontraste" with signer and non-rotated TV video

As figures 1 – 3 illustrate even within the ARD (Association of Public Broadcasting Corporations in the Federal Republic of Germany) there are different approaches to the screen composition. The size and position of the signer video varies and the TV picture can be flat or rotated, or the sign language speaker can overlap the TV picture or be located next to it.

Based on existing services, RBB defined the main parameters for customisation as size, position and layout of the two videos. As the parameters had to work in combination with each other and in relation to the TV video, RBB created a framework in which each parameter option was defined.

The following options are calculated on a screen dimension of 1280 x 720 pixels:

#	Size signer	Dimension of S(igner) and TV image in pixels	Relation (px^2:px^2)
1	Very big	600x600px (S) – 700x395px (TV)	1,30
2	Big	500x500px (S) – 800x451px (TV)	0,69
3	Medium	450x450px (S) – 850x479px (TV)	0,50
4	Small	400x400px (S) – 900x508px (TV)	0,35

Dimensions of signer video and relation to TV video

#	Position signer	Alignment of signer video		Alignment of TV video	
		Horizontal	Vertical	Horizontal	Vertical
1	Top right	Right	Top	Left	Centre
2	Bottom right	Right	Bottom	Left	Centre
3	Top left	Left	Top	Right	Centre
4	Bottom left	Left	Bottom	Right	Centre

Alignment of signer and TV video depending on position of signer

In the case of overlapping signer and TV video, the signer was positioned so that his shoulder overlapped the outer edge of the TV video. This limited occlusion by the signer, depending on the gesture to a maximum length of one arm. For testing purposes we referred to this parameter as layout.

#	Layout	Arrangement of videos	
		Rotation of TV video	Occlusion
1	TV not rotated, not overlapping	Not rotated	no occlusion
2	TV not rotated, overlapping	Not rotated	occlusion by signer
3	TV rotated, not overlapping	Moderate rotation	no occlusion by signer video
4	TV rotated, overlapping	Moderate rotation	occlusion by signer

Arrangement of signer and TV videos in terms of rotation and occlusion

In the video editing suite, the above framework was used to create a set of templates for the screen composition. For each option or combination of options both the signer video and TV video were imported into the template and saved as pre-mixed video stream variants.
As seen in figures 1-3, the screen background can vary in terms of colour and design. For the purpose of our tests a plain grey screen background was chosen and used throughout the tests.

Methodology

The aims of the tests were to determine users' screen composition preferences for signers on TV screens in a closed service and to determine if the preferences varied across content genres.
Over a period of 16 weeks from November 2015 to March 2016 a panel of 30 deaf viewers from Berlin and Brandenburg, took part in a field trial, testing and rating customisation options for three genres of TV programmes news, sport and documentary. The TV programmes were representative of typical RBB productions, they were all pre-recorded and the signer videos recorded at a later date. For each customisation option or combination of options, the signer video and TV video were

mixed in advance and provided as streams. A specially designed HbbTV application that ran on the testers' TV meant they could select and change the customisation options and view the corresponding pre-mixed video in the comfort of their own home. Testers provided feedback on their preferred customisation options using an online questionnaire.
The screen composition parameters tested were size, position and layout. In a first round of testing, for each of the basic parameters four options were evaluated independent of other parameters. The parameters and options were the following:

Parameter	Option 1	Option 2	Option 3	Option 4
Size	Small	Medium	Large	Very large
Position	Bottom right	Bottom left	Top right	Top left
Layout	TV rotated, signer not overlapping	TV rotated, signer overlapping	TV not rotated, signer not overlapping	TV not rotated, signer overlapping

Parameters and options in first round of RBB user tests

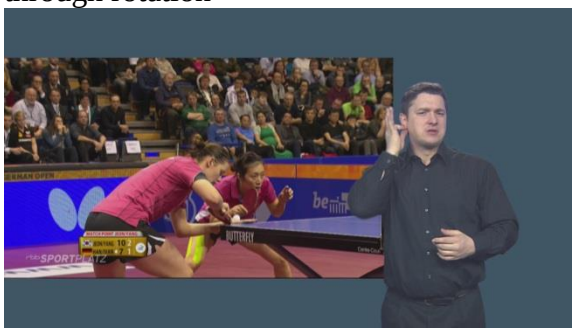
Following the first round of tests, users' preferences were evaluated and for each genre the least popular options per parameter were removed. In the second round of testing, for each genre a combination of the remaining options per parameter were evaluated by the testers. In a third round of testing the same options were evaluated again with new content.

Recommendations
When tested independently the results of the user tests were most conclusive for the parameter position, followed by size and less so for layout.
Tested independent of other parameters and across the three programme genres the vast majority of the test persons (over 72%) preferred to have the signer video positioned at "bottom right" of the screen, the second preference (14% of testers)was "top left" for news and documentary, for sport "top left" and "top right" share second place with 14% each.
Tested independent of the other parameters and across the three programme genres the majority of the test persons (46 – 55%) preferred to have the sign video size as "very large", followed closely by "large" (36-46%)

The results for the parameter layout were the most inconclusive. Globally, when tested independent of other parameters testers seemed to prefer the videos to overlap.
Tested in combinations the results for the parameters correlated with the results above.
The results of the user tests indicated that the most important settings for users are position and size, the layout preferences vary according to genre.
For HbbTV signer services with no customisation options we would recommend to adopt the following screen composition for the genres news, sport and documentary.

Genre	Size	Position	Layout
Sport	Very large	Bottom right	TV not rotated, signer overlapping
News	Very large	Bottom right	TV rotated, signer not overlapping
Documentary	Very large	Bottom right	TV not rotated, signer overlapping

For other genres we recommend the screen composition very large, bottom right and an overlap between the TV and signer if the TV picture is not rotated. However as the tests offered no clear consensus on layout, decisions should be based on the importance of the imagery of the TV programme and possible information loss if part of the screen is obscured by the signer or distorted through rotation



Very large signer, bottom right, and overlapping flat non-rotated video

Very large signer, bottom right beside rotated video

In a service offering customisation options the following options per parameter are recommended, regardless of genre.

Parameters	1st Option	2nd Option
Size	Very large	Large
Position	Bottom right	Top left
Layout	TV not rotated, signer overlapping	TV rotated, signer not overlapping

When prioritising the order in which the parameters are presented to the user we would suggest starting with size, followed by position and then layout.

Sign Language Guidelines and References

1. Sign Language Interpreting Guidelines for Digital TV equipment and services from The Centre for Excellence in Universal Design, National Disability Authority, Ireland
URL: http://universaldesign.ie/Technology-ICT/Irish-National-IT-Accessibility-Guidelines/Digital-TV-equipment-and-services/guidelines-for-digital-tv-equipment-and-services/Sign-Language-Interpreting/Ensure-that-the-signer-is-easy-to-see-and-read/

2. "Television access services. Review of the Code and Guidance", Ofcom, March 2016
URL: https://www.ofcom.org.uk/__data/assets/pdf_file/0016/42442/access.pdf

3. Sign language guidelines issued by Signing Books for the Deaf, a project funded by the EU Telematic Application Programme
   URL: https://www.sign-lang.uni-hamburg.de/signingbooks/sbrc/grid/d71/guidein.htm

4. "Mit den Augen hören – Fernsehen für Gehörlose", Bachelor's thesis in German by Julia Wedel, 2012
   URL: http://sign-dialog.de/files/Publikationen/Mit%20den%20Augen%20h%C3%B6ren%20-%20Fernsehen%20f%C3%BCr%20Geh%C3%B6rlose.pdf

9.8. Guidelines for screen composition in HbbTV sign language applications (German)

Best Practice – Produktion Gebärdendienst im rbb

Autor: Sven Glaser

Einleitung

Skizzierung Use Case

Im EU-Förderprojekt HBB4ALL wurde vereinbart zu überprüfen, inwieweit der HbbTV-Standard das Angebot an Gebärdensprachdiensten unterstützt. Eine Marktanalyse ergab, dass ein echtes hybrides Angebot derzeit technisch nicht realisierbar ist, weil sowohl die benötigten HbbTV2.0-Geräte am Markt nicht verfügbar sind, als auch das gleichzeitige Dekodieren zweier verschiedener Videostreams (IP- und DVB-Video) im Standard nicht verpflichtend ist.

Daher wurde die Festlegung getroffen, ein Gebärdensprachdienst könne derzeit nur als vorproduziertes Bild-in-Bild-Video angeboten werden. Anpassungen durch den Nutzer nach Größe, Position und Anordnung der beiden Ursprungsvideos müssen also vorher festgelegt und vorbereitet werden. Das Videomaterial des Gebärdensprechers muss im Studio vor Green Screen aufgezeichnet werden, und anschließend in allen ausgewählten Darstellungsvarianten mit dem Beitragsmaterial am Schnittplatz zusammengefügt werden, bevor es in eine entsprechende (HbbTV-)Anwendung eingebunden werden kann. Konkret gab es vier verschieden Größen, Positionen und Anordnungsoptionen pro Video, d.h. nach dem Einzeltest der genannten Parameter Größe, Position und Anordnung waren in Kombination acht oder zwölf Varianten eines gebärdeten Videos nötig.

Dieses Dokument stellt alle nötigen Arbeitsschritte für ebenso eine Produktion eines Gebärdensprach-Angebotes in Form von Guidelines dar.

Vorbereitung

Material

Um den Übersetzungsprozess für die Aufnahme möglichst reibungslos zu gestalten, ist angeraten dass sich Gebärdensprecher/-dolmetscher frühzeitig am konkreten Material vorbereiten können.

Auswahl/Beschaffung Sendung

Der zu übersetzende Beitrag muss (ggfs. durch das Fernseharchiv) zum Zwecke in seiner spezifischen Form bereitgestellt werden, etwa als DigiBeta, XDCAM oder als Videodatei. Somit kann das Zuspiel hinein in das TV-Studio für Monitore und für die Bildmischung erfolgen.

Gebärdensprecher/-dolmetscher benötigen den jeweiligen Beitrag auch für die Vorbereitung. Das kann vereinfacht durch einen Download aus der Mediathek oder deren Content Management System erfolgen. So erspart man sich eine Transkodierung vom Archivmaterial.

Beschaffung UT

Untertitel für den ausgewählten Beitrag liegen als Datei vor, entweder originär in den Ressourcen der Untertitel-Redaktion oder als STL-File aus dem Rückempfang. Wenn nötig muss die UT-Datei händisch angepasst werden, um sie als Textdatei an Gebärdensprecher/-dolmetscher weitergeben zu können.

Des Weiteren dient die UT-Datei später als Skript für den Teleprompter. Dann müssen alle Timecodes entfernt und ggfs. Kommentare für längere Pausen oder Musik (bzw. andere nonvisuelle aber wichtige Kontexte) eingefügt werden.

Material für Gebärdensprecher

Der Beitrag als Video- und die Untertitel als UT-Datei würden an Gebärdensprecher/-dolmetscher weitergeleitet.

Für eine sehr textlastige Gebärdenübersetzung lohnt es sich, die Untertitel in das Beitragsvideo einzufügen und ein komplett transkodiertes Video zu erhalten. Vorher muss dann manuell die Timecode-Basis, sowie Anfang und Ende der UT-Datei genau auf die Video-Zeitbasis angepasst werden. Dann kann das Video, etwa via ARDBOX freigegeben werden.

Aufzeichnung

Studio

Studiozeit muss fest gebucht werden. Das schließt eine Kamerafrau/-mann ein, sowie Licht und Bildmischung.

Maske

Die Maske muss gebucht werden. Das ist besonders wichtig für eine Aufzeichnung außerhalb der üblichen Betriebszeiten der Maske.

Teleprompter

Eine Kollegin/Kollege für die Bedienung des Teleprompters muss fest gebucht werden.

Zuspiel

Eine Kollegin/Kollege muss das Zuspiel des Originalbeitrages ins Studio (Monitore) und in die Bildmischung steuern.

Bildmischung

Die Bildmischung kann am Bildmischer der TV-Regie erfolgen oder zeitlich später an einem Schnittplatz. Beides muss vorher disponiert sein.

Produktion

Studio

Jeder Gebärdensprecher/-dolmetscher im Studio benötigt einen Monitor-Bildschirm und einen Teleprompter.

Vor Aufzeichnung

Vor Beginn der Aufzeichnung müssen alle Bildrelevanten Einstellungen festgelegt sein.

Ausleuchtung/Maske

Gebärdensprecher/-dolmetscher hat die gewünschte Position vor dem Green Screen zugewiesen bekommen. Die Ausleuchtung muss so gestaltet sein, dass

1) der Hintergrund maximal gleichmäßig ausgeleuchtet ist um Fehler im Chroma-Keying zu vermeiden und

2) Gesicht und Hände genug Helligkeit und Kontrast besitzen, um sich von dem gewünschten Hintergrund der Bildmischung optisch perfekt abzuheben.

Gebärdensprecher/-dolmetscher muss von der Maske kamerafertig vorbereitet werden.

Kameraeinstellung

Zoom und Kameraposition (Höhe, Winkel) müssen so gewählt werden, dass Gebärdensprecher/-dolmetscher jeweils ca. eine Handbreit unter der Gürtel- bis über die Scheitellinie sichtbar ist. Für ausladende Gebärden muss links und rechts ca. 2/3 Armlänge Platz sein.

Teleprompter

Das vorbreitetet Prompterkript wird in den vorgesehenen PC kopiert und in die dafür vorgesehene Software geladen werden. Die Kollegin/Kollege am Prompter muss zudem den Ton des Beitrages hören können.

Zuspiel (Monitore, Ton, Positionen der Beteiligten)

Das Zuspiel des zu dolmetschende Beitrages muss startklar sein. eine DigiBeta z.B. muss im Zuspielgerät an der zeitlich gewünschten Position stehen. Der Ton muss sowohl im Studio als auch in der Bildmischung anliegen. Ggfs. muss eine Wechselsprechverbindung zum Studio eingerichtet sein, um wenn nötig das Zuspiel stoppen und neu beginnen zu lassen.

Ingest

Eine Ressource für die Aufzeichnung (z.B. ISIS) muss zur Verfügung stehen, um entweder nur die Gebärdenaufnahme oder die komplette Bildmischung abspeichern zu können.

Während Aufzeichnung

Gebärdendolmetscher

Gebärdensprecher/-dolmetscher beendet seine Aktivität (auch ein Beobachter kann das veranlassen) sobald er einen Fehler in der Übersetzung o.ä. bemerkt. Das Zuspiel wird dann zurückgesetzt und für einen Neustart pausiert.

Steuerung Aufnahme, Zuspiel

Auf Zuruf kann das Zuspiel gestoppt werden. Wenn nötig wird es auf den Ausgangszeitpunkt zurückgesetzt.

Der Produktionsassistent notiert in jedem Falle die Echtzeit des jeweils begonnen Aufnahmeprozesses, um später den gewünschten Take identifizieren zu können.

Bildmischung

Bildmischer TV-Regie

In der TV-Regie werden Beitrag und Gebärdenaufnahmen nach dem vorbereiteten Darstellungsmodell zusammengemischt und aufgezeichnet.

Schnittplatz

Ingest

Das Material des zu gebärdenden Beitrags muss ingestet sein, und für den Import in den Schnittplatz zur Verfügung stehen (ISIS, IMAX etc.). Auch das aufgezeichnete Gebärdenmaterial muss vorliegen.

Parameter-Sets für Gestaltung

Die Parameter-Sets für die Gestaltung des Bild-in-Bild-videos müssen vorbereitet sein. Das umfasst die gewünschte Größe für den Beitrag, als auch für das Gebärdenvideo, die Positionierung sowie die Anordnung beider Videos zueinander.

Schnitt

Nach dem Import beider Videomaterialien, werden diese zueinander zeitlich synchronisiert, die gewünschte Größen, Position und Anordnung mit der Schnittsoftware realisiert, und In- und Out-Punkte gesetzt. Für andere Größen und Positionen muss dieser Vorgang wiederholt werden.

Export

Das wie gewünscht geschnittenen Video bzw. dessen Varianten werden in das Zielformat exportiert.

Verarbeitung

Transkodierung

Je nach Videoformat muss das Bild-in-Bild-Video in ein weiter verarbeitbares Format transkodiert werden. Das würde nötig wenn z.B. die individuelle Dateigröße für interne Ressourcen angepasst werden muss.

Processing nach Mediathek-Standard (erneutes Transkodierung)

Um das Video in die Mediathek einbinden zu können muss es in die vereinbarten A/V-Profile transkodiert werden (VOPS).

Umbenennung

Je nach Ausspiel-Plattform muss das Video nach den notwendigen Normen umbenannt werden. Das geschieht entweder automatisch (VOPS bzw. CMS) oder wie im Falle HBB4ALL manuell, um es in die Logik der Testanwendung einzubinden.

HBB4ALL-Spezifisch

Config-System

HbbTV-Anwendung Konfigurieren

Da die HbbTV-basierte Testanwendung ein Umschalten zwischen verschiedenen Darstellungsoptionen und Sendungen ermöglichen sollte, wurde die Anwendung so entwickelt, dass die Umschaltfunktionalitäten der Applikation (für mittels einer vordefinierten Namenskonvention auf die entsprechend vorproduzierten Videovarianten zugreifen konnte. D.h., alle Parameter-Einstellungen in der Anwendung (Buttons, Texte, Zugriff-auf) müssen angepasst werden, um genau die richtigen Videodateien anzuwählen.

Testen

Nach erfolgtem Transkodieren und Upload der Videovarianten, und nach der Konfiguration der Anwendung muss der Gebärdensprachdienst insofern getestet werden, als dass alle Schalter in der Anwendung den (scheinbar) richtigen Effekt haben, also dass z.B. der Größen-Button „Sehr groß“ auch die richtige Videovariante mit den gewünschten Größe auswählt.

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