HBBTV USABILITY ANALYSIS



By order of:



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>> FINAL REPORT

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AGENDA

- 1. Research Design
- **2. Applications Test**
- **3. Hardware Test**
- 4. Recommendations for Action



RESEARCH DESIGN

Preparation and realisation of a <u>qualitative, explorative</u> Usability Analysis of HbbTV



1.1 Test Outline

Applications Test:

27. and 28.05.2014

Location:

Observation Lab of the Mainz University of Applied Sciences

Object of Study:

8 applications on 1 device

Goals:

Derive recommendations for action regarding the development of applications for HbbTV

Subjects: n = 12

Hardware Test:

10. and 11.06.2014

Location:

Observation Lab of the Mainz University of Applied Sciences

Object of Study:

1 application on 4 devices

Goals:

Derive recommendations for action regarding the development of HbbTV capable devices

Subjects: n = 14



1.2 TV Broadcasters





1.3 Device Manufacturers

PHILIPS



SONY

TOSHIBA



in alphabetical order

1.4 Methods of the Test

- Eyetracking (A)
- Post-Test Questionnaire (A,H)
- Retrospective Think Aloud (A)
- Video Observation (A,H)
- RC Puzzle (H)
 - A = Applications Test H = Hardware Test









APPLICATIONS TEST

8 applications on 1 device

Results and the recommendations for action derived



2.2 Switching between applications

2.3 Navigation within applications











Rating (post-test survey) of interfaces according to:

- clarity
- ease of use
- operating options
- suitability for search of video content
- suitability for browsing video content
- orientation





SEGMENTED FULL FRAME



COLUMNS

LIST





Two-Axes	List	Tiles	Segmented Full Frame	Columns
2.1	2.3	1.7	2.0	1.6

Rating on a five-point scale: 1 = best, 5 = worst



The results shows that **all navigation models tested worked very well**.



Columns are particularly suitable for applications with a great navigational depth (many hierarchy levels).



2.2 Switching between applications



"heat map" with the accumulated data from subjects 3, 4, 5, and 6 Task: "Please switch to the Electronic Program Guide (EPG) of Das Erste."



2.2 Switching between applications



Video 2: Gaze plot subject 3

Task: "Please switch to the Electronic Program Guide (EPG) of Das Erste."



2.2 Switching between applications Recommendations for Action



Direct links between different applications should be offered whenever possible (e.g. as a shortcut).



Internal plurality (inconsistent use of the keys within one channel) should be avoided especially in the color allocation.



If two applications already offer contentual connections, direct links should be set (e.g. program preview and VoD offers).



2.3 Navigation within applications



Problems also occurred when **subjects "lost" their cursor** and were unable to identify their current position or which elements they could select next.



It should be ensured that the **user can identify the current position of the cursor at all times** and know which elements they may select next.



The return key should be available to the user on all navigational levels of the application.



2.3 Navigation within applications

Das Erste	ZDF	Pro Sieben	RTL	ARTE	RTL2	QVC	Sonnen- klar.TV
1.7	2.2	2.3	2.1	3.0	2.3	1.8	1.6

Rating on a five-point scale: 1 = best, 5 = worst

criteria: simplicity, clarity, information content, intuitive operation, visual presentation, comfort of use



The navigational structure of **Sonnenklar.TV** in particular was praised by the subjects for its **simplicity and clarity**.



"Very simple, and it is easy to find one's way around." *subject 10* "Very 'simple' design. Very good overview." *subject 4*



The navigational structure of **DasErste** was also well received by the subjects. **Complex yet structured.**



2.3 Navigation within applications Recommendations for Action



The navigational structures should be kept **as complex as necessary** but **as clear and simple as possible**. The subjects preferred few menu items and simple graphics.



HARDWARE TEST

1 application on 4 devices

Results and the recommendations for action derived



3.1 Basics

- 3.2 Ideal Remote Control
- 3.3 Directional Pad
- 3.4 Media and Color Keys
- 3.5 Performance and Feedback



3.1 Basics

All subjects were able to familiarize themselves quickly with the various RC units and solve their tasks.

A effectiveness of the usability is given.





3.2 Ideal Remote Control

RC Puzzle



After the subjects had completed all their tasks, they were asked to assemble their **ideal remote control** from the control elements in the figure above and to explain their choices of individual components.



3.2 Ideal Remote Control



Ideal RC, as assembled from the individual preferred elements



Vertical segmentation into a TV segment and a media segment



The remote control should be clearly segmented and structured.

2 ABC DEF 3 5 JKL MNO 6 4 GHI 8 TUV WXYZ 9 TV-SUBTITLE **Section** Media-Section OPTION 1



3.2 Ideal Remote Control

The aggregated ratings for all remote controls resulted in a very condensed field. The overall rating covers the following aspects:

- Feel
- Positioning of keys
- Clarity

- Legibility of labels
- Imagery used

Samsung (keys)	Samsung (touch)	Toshiba	Philips	Sony
2.3	2.6	2.4	2.2	2.7

Average rating of all quantitative questions in the Post-Test Survey [rating on a five-point scale: 1 = best, 5 = worst]



3.3 Directional Pad



The D-pad on the right was the one most frequently used by the subjects for their ideal remote.



The subjects placed the D-pad in a central position.

Explained by:

• "good feel"



- "easy-to-understand key arrangement"
- "generally uncluttered keypad"





3.3 Directional Pad

Learning Effects

Average Task 2.1	Average Task 3.1	Average (touch) Task 2.1	Average (touch) Task 3.1
1:33 (n=34)	1:36 (n=31)	3:55 (n=5)	1:35 (n=4)

Task 2.1: Run video (either directly from the video library or via EPG). Mean value across n operations (in minutes)

Task 3.1: Run video via the alternative method (EPG or video library, depending on method chosen in Task 2). Mean value across n operations (in minutes)



Learning effect with the touch-pad remote control





3.3 Directional Pad

Recommendations for Action



The D-pad should be located in a central position on the remote control.



The D-pad should feel different than the surrounding keys.



It is advisable not to place too many other keys in the immediate vicinity of the D-pad.



Innovative remote control may be added as an alternative.



3.4 Media and Color Keys



Nearly all subjects preferred the remote controls' media keys over the on-screen control elements to navigate within the videos.

(Task 2.2: Fast-forward to 20:00; Task 2.3: Pause video playback; Task 2.4: Re-start video playback)



13 of the 14 subjects integrated media keys into their ideal remote.



3.4 Media and Color Keys

In some cases, the color keys had been assigned additional functions specific to the device. They were activated before the HbbTV app had loaded completely.



A dual assignment of the keys should be avoided.

The "home" key led to unexpected device menus (not HbbTV)





subject 7, 36:50 - 37:50 (hardware test)



3.5 Performance and Feedback



A good performance played a major role for the subjects. When loading delays occurred, however, the subjects found it useful when they were visualized clearly.









Example: Feedback device



3.5 Performance and Feedback

Recommendations for Action



Loading and waiting times should always be indicated clearly.



Loading times should be kept as short as possible.



RECOMMENDATIONS FOR ACTION



4.1 Recommendations for TV Broadcasters

User Interfaces





rating on a five-point scale: 1 = best, 5 = worst

4.1 Recommendations for TV Broadcasters



Use color keys for application switching. Keep Key consistency



Columns are particularly suitable for applications with a great navigational depth (many hierarchy levels).



If two applications already imply contentual connections, direct links should be set (e.g. program preview and VoD offers).



Return key availablity should be ubiquitous on all navigational levels.



Loading and waiting times should always be indicated clearly.



4.2 Recommendations for Device Manufacturers



D-pad location should be central and haptically set off



A second, innovative remote control may be added as an alternative.



A dual assignment of the color keys should be avoided.



The remote control should be clearly segmented and structured.



Loading and waiting times should always be indicated clearly.



Next Steps

• International version of the study

• EU funding proposal

 We are looking for international partners. Please feel free to contact us <u>sven.pagel@hs-mainz.de</u>



THANK YOU!

Feel free to download the complete report:

http://www.tv-plattform.de/images/stories/pdf/studie-usability-hbbtv-smarttv-2014-en.pdf



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