

WEB on TV: Cross-National User Study for Designing Better User Experience

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ABSTRACT

In this paper we present the user studies conducted as a part of an international project EU SEE TV-WEB, funded by the European Union. The project combines the traditional broadcast world with the dynamic web environment while focusing on the aspects of usability and user experience in order to provide the best possible experience for the elderly people, economically weak people and people living in rural areas who do not usually use personal computers and who have no Internet connection. The results of the user studies about the media literacy, media use and the target users' interest about TV-WEB services, conducted as a part of the project in two different European countries i.e. Austria and Montenegro, are also presented. Additionally, we present the user-centered design process for the service that was conducted as a part of the user study in Slovenia.

Categories and Subject Descriptors

D.2.2 [Design Tools and Techniques]: User interfaces.

H.1.2 [User/Machine Systems]: Human factors.

H.3.4 [Systems and Software]: Performance evaluation (efficiency and effectiveness), Question-answering (fact retrieval) systems, User profiles and alert services.

H.5.2 [User Interfaces]: Evaluation/methodology, Graphical user interfaces (GUI), Interaction styles (e.g., commands, menus, forms, direct manipulation), Screen design (e.g., text, graphics, color), User-centered design

General Terms

Design, Experimentation, Human Factors.

Keywords

TV-WEB, TV, Internet, digital divide, user study, user-centered design, user experience, human-computer interaction, focus groups, user evaluation, AttrakDiff.

1. INTRODUCTION

The gap between those who use computers and the Internet and those who do not is defined as digital divide [1]. One of the

possible ways of reducing the digital divide is building fixed or wireless networks for broadband internet access. However, in the case of rural coverage, fixed networks proved to be an expensive solution [2]. On the other hand, wireless networks depend on the frequency spectrum which is a scarce resource, often occupied by existing mobile services [3]. Therefore, new frequency allocations are expected to be assigned in a part of spectrum which will be released when countries will switch from analogue to digital broadcasting.

An alternative option to offer Internet services could be the usage of Digital Terrestrial Television (DTT) networks. In addition to TV programs, DTT networks can deliver also other services. Frequency spectrum was equally divided among countries by the rule of equitable access to the limited resource. On the other hand, TV markets are rather different from country to country. In small TV markets, such as the most of the South East European countries' markets with low number of television programs and low probability of producing new content for digital terrestrial platform, some frequencies allocated to digital television are not used or some proportion of existing DTT multiplex capacity is not used. It can be argued that those frequencies could be used for Pay TV services, but the size of the market (the economical power of broadcasters and the number of viewers) proved that Pay TV could face economical difficulties. Therefore, the potential for promoting a new approach whereas additional services will be used is evident.

A new approach to this problem is suggested by an international project TV WEB [4] funded by the European Union. The idea of the project is to use the free DTT broadcasting frequency spectrum capacities for transmitting selected Internet content (such as news, e-services etc.), thus ensuring a sort of Internet experience via TV devices. The target groups are certain less advantaged segments of the population, or those in rural areas without broadband access. The goal of the project is to ensure a kind of "push content" experience, which should allow for interactive experience without an existing return channel. This means that users can receive information but can't input or send data. The user should have the same interactive experience as being connected to the internet through bi-directional network,

therefore the complete content of selected web sites should be transferred to the user device. The project pilot setups will be deployed and tested in six European countries.

In this paper we present the user studies about the media literacy, media use and the interest about such services in two different European countries i.e. Austria and Montenegro. Additionally we present the user-centered design process for the service that was conducted as a part of the study in Slovenia.

2. USER STUDY IN AUSTRIA

A user study about the media literacy, the media use and the interest of the service of TV-WEB was conducted in Austria. The focus of this study laid on elderly people who have a low computer literacy. Therefore eight women and four men aged between 52 and 84 were interviewed. Half of the interviewees live near the city and the other half in the countryside. One third of the people are still working and the others are retired.

All of the interviewees use the press, TV and radio for provision of information. Only one third uses the Internet.

80 percent are watching TV two or more hours per day. Primary they are watching news, TV series and sport. Also documentaries and TV shows matter to 50 percent of the interviewees. Most of them don't have any problems using a TV.

40 percent of the interviewed persons read teletext and mostly look up information about the weather, sport results and the TV program.

60 percent of the interviewees have a computer at home and use it about two hours per day. They organize their photos, use the Internet or play computer games like chess. Most of them have problems using the computer because of its complexity or they have too little interest to grapple with this technology.

Only 33 percent have Internet at home and they spend about one hour per day for surfing through the web. Most of them look up general information, plan holidays, search for health related topics or go on local websites.

Half of the interviewees would be interested in the service TV-WEB. The people who are interested hope for an easier Internet use than on the computer and that information will be easier to obtain. The people who are not interested say that there is already a lot of information available or that they cannot imagine how such a service could work. Topics of interest are primary health related topics, general local information, information about the public transport, about travelling, tips for activities and events and sport results.

The user interface should be simple in the first place. Also big sized font is very important for elderly people. They would prefer symbols instead of text for buttons and a lot of colors. A minimalist design is more important than the perfect look. The interviewees would pay nothing up to 7 euros for TV-WEB.

3. USER STUDY IN MONTENEGRO

Similar study like in Austria was conducted also in Podgorica, Montenegro. During a focus group session, participants were answering questions and discussing about their media literacy and use, and their interest about the TV WEB service. The focus group session was consisted of four parts:

- Collection of demographic and media literacy data about the focus group participants.

- Collection of content topics that should be included in the TV-WEB service.
- Collection of ideas about the design of the graphical user interface and interactions between the user and the system.
- Final thoughts on TV-WEB service usage and the business model.

Twelve participants, 10 male and 2 female, took part in the focus group session. The youngest participant was 21 years old, while the oldest one was aged 50. The participants' income ranged between 200 and 1300 euros net per month.

All 12 participants use the TV, 11 of them use the Internet, 9 of them use radio, and 8 of them use the press for provision of information. 70 percent of all participants reported they are watching TV for 3 or more hours per day. Most of the participants reported they don't have any problems using a TV.

Most of the participants are using TV and Internet to get information about the daily news and the sport results. Additionally, 58 percent of the participants are using the Internet to stay connected in the social networks.



Figure 1: Focus group in Montenegro

In the second part of the focus group session, participants were asked about what type of content should be provided by the TV-WEB service. Some of the suggested content topics were: agriculture information, planting calendar, tourism, maps, history, documentary, food (recipes, cheapest offers), business (special offers, sales, advertisement), news, fashion, phone directory, health (opening hours, general info), weather, sports, e-government (opening hours, public laws, taxes, common procedures), traffic information, public transportation timetables, general educational information and list of laureates.

Afterwards, the participants were asked to choose three, in their opinion, most important content topics out of all proposed. According to the participants, TV-WEB service should provide information about: the news (occurred 7 times among the most important), sports (occurred 6 times), weather (occurred 5 times), and tourism (occurred 3 times).

In the next part of the focus group session, participants were asked about the type of interaction and user interface they would prefer for the TV-WEB service. Some of the suggestions were: structured content into layers (max 3 layers), navigation with numbers (like teletext), navigation using remote control arrows (up, down, left, right), as simple as possible design, at any time at most 9 topics on screen at once, resizable fonts - user selectable (max 3 sizes), not a lot of colors, one content screen per click and

screen, Wii like interface with channels for every type of content and max 3-4 clicks to get any topic or content.

In the similar manner as in the previous part, the participants were asked to choose three, in their opinion, most important descriptions of the type of interaction and user interface out of all proposed. According to the participants, it is really important that the user interface of the TV-WEB service is simple to use (occurred 11 times among the most important). Additionally, it is important that the user interface and the fonts are resizable (occurred 3 times) and functional (occurred 3 times).

When asked about their final thoughts on TV WEB service usage, the participants reported they would definitely like to use the service if it is provided at affordable price. They are prepared to spend up to 150 euros starting costs, including HW equipment (i.e. STB). In addition, monthly fee of up to 5 euros max is acceptable for the participants.

4. USER STUDY IN SLOVENIA

The user study in Slovenia was conducted in Ljubljana at the Faculty of Electrical Engineering. Eleven male participants divided into three groups took part in the study. The user study was composed of three parts:

- Development of user profiles, personas and use case scenarios.
- Graphical user-interface and interaction design.
- User experience evaluation, using AttrakDiff.

In the first part of the study, each group created user profiles for the target end-users. Three different user profiles were created. Each of them included information about the user's age, location, language and culture, computer experience, education, intellectual abilities and the skills, the environment of use, users' key activities and tasks, and possible user disabilities.

In the next step, study participants created three different personas representing the target end-users. Besides the name and photo, each persona included brief personal description, such as: age, place of residence, family situation and education, technology profile, need profile and other additional information study participant found useful when they were creating their personas.

Once the personas were created, study participants developed several scenarios of use for the TV-WEB service.

In the second part of the study, each group of participants designed the interactions and the graphical user interface for the most important screens of the TV -WEB service. After that, they presented their TV-WEB service paper prototypes to the other two groups of participants, as shown in Figure 2.

In the last part of the study conducted in Slovenia, study participants completed the AttrakDiff questionnaire for the TV-WEB services presented by the other two groups of participants.

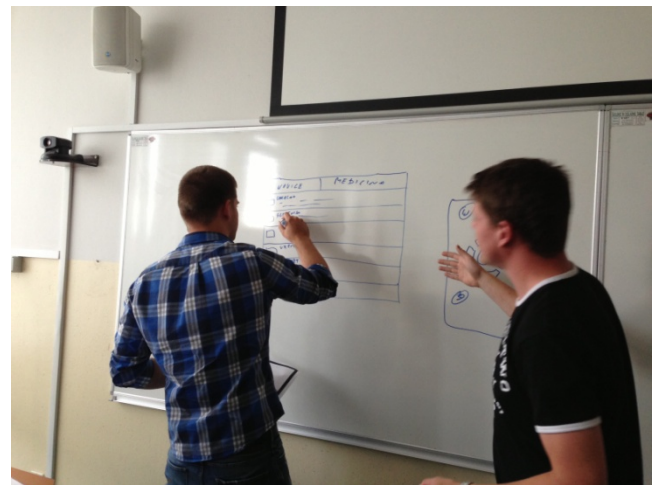


Figure 2: Presentation of the TV-WEB service paper prototypes

5. CONCLUSION

In this paper we present the user studies conducted as a part of an international project, named EU SEE TV-WEB, funded by the European Union. The results of the user studies in Austria and Montenegro revealed the media literacy, media use and the interest about the services that will be provided by the pilot setups. Additionally, the results from the user study in Slovenia gave us insights about how the user interface and interaction should be designed.

6. ACKNOWLEDGMENTS

The work that led to this paper was partially financed by the project SEE TV-WEB "TV-WEB – Tackling the Digital Divide in Southeast Europe by Using the Capacity of DTT Networks" co-funded by South East Europe Transnational Cooperation Program.

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