

ITV services for all people, a design study.

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ABSTRACT

Is it possible to design easy to use ITV applications for all? Well it should be, but how do we design to achieve this objective?

This study is the first of five aiming at a design for all strategy where focus is to find the most difficult areas in further design activities to concentrate the on.

The ITV service in this design study is intended to bring easy and understandable information to the guests at a municipal elderly care centre and the guest's next of kin. This design should work both on a computer and on set top boxes for TV. The elderly target group has severe difficulties due to the system of care in Sweden, where elderly people live in their own homes as long as possible. Their difficulties can be of both psychiatric and physiological nature.

Individuals with defined difficulties in this UCD study was more effective than other to point out the difficult areas of the design and at the same time give more hints to the designer of how to solve them. The consequence of the results of the study is to start to rethink of how we choose users to participate in the design process. Maybe the design process becomes more effective and at the same time lowers the need of accessibility adaptation after the design when not only choosing representative participants in the process.

Keywords

Design for all, ITV, design methodology, elderly care centre.

1. Introduction

This study is part of a study as one out of five design studies with the same design methodology and aim.

The study has its input in the area of designing ITV-services for broad user groups. The ITV application in this study is a service intended to bring easy and understandable information to the guests of a municipal elderly care center and the guest's next of kin. This service shall work both as an ITV services on set top boxes for TV as well as a platform for Internet based services.

One of the major problems in this design is the variety of the users ability, both physical and intellectual. This means that normally we have to take special considerations to the accessibility of the

design. We consider this as the most exciting problem in designing ITV services that all users can use and at the same time make the need of special adaptation for people that have functional difficulties as small as possible.

2. Background

2.1 Methods in design

We have to define what we mean by "Easy to use". Is it just easy to navigate physically or is it easy to understand and easy to read? Simple and effective navigation systems on ITV application is one of the most important things when making it user-friendly.

We can approach the question in several ways. The one we have chosen is to involve the target users in the design process. This has been successful in UCD and in co-operative design processes [3] Co-operative design was used in the project "KidStory" [17]. The kids were equal partners in the workgroups. The objective of the workgroups was to build low-tech prototypes with an obvious focus on usability issues.

2.2 Users in design

Most of the design approaches in order to make easy to use products for all people is to choose representative participants [1][10] (common users) to participate in the design process.

The group "common users" consists of 'all users'. 'All users' include people with all possible variations of conditions [14].

An individual's function is something that can change over time [5] or be tied to a certain situation, which makes it difficult to create special solutions for all possible situations.

One solution is to hold down the amount of individuals participating in the evaluation as in Nielsen [9] suggesting to use as few as 8 -10 individuals in a "discount" usability test to get hold of up to 80% of the usability problems.

The TED-model(also known as the "Bollnäs model for testing, evaluation and design of information and communication technology services, proposed by Ohlsson, Persson and Östlin [13] advocates that individuals with limitations in their functioning could be valuable to indicate difficult areas of the usability.

2.3 "Usability" and "Quality of use"

What do we mean with "usability" in designing ITV applications?

From the user perspective the application should be easy to use and it is one of the most important factors in the quality of use.

For consumers, the product quality means one thing and for producers it means an entire other thing [4]. For the producer perceived quality is very often connected to usability issues as in

ISO [6] the effectiveness, efficiency and user satisfaction. The effectiveness and efficiency is rather simple for a designer to bring into the design but the user satisfaction is more complicated to achieve in a simple way.

Many producers regard user perceived quality (user satisfaction) as an inaccurate judgment of product quality [1]. According to Shackel [15] usability is not a constant property, because it is depending on the context. Usability is in the discussion by Bevan and Macleod [2] seen as “*a property of the overall system; it is the quality of use in a context*”. The context of use in ITV services can be from a “couch potato” to a social group activity.

Most of the usability methods were developed with working environment in mind. For most ITV applications all users/consumers are the target and the environment is also wide from the use of a mobile-device to a big television screen.

A very important factor in usability is the affordance factor [11][12] to give guidance for the designer.

3. The study

This is for a service intended to bring easy and understandable information to the guests at a municipal elderly care centre and the guest's next of kin. This site should work both on a computer and on set top boxes for TV.

The target group has severe difficulties due to the system of care in Sweden, where elderly people live in their own homes as long as possible. Their difficulties can be of both psychiatric and physiological nature.

The design in this study is based in the tradition of the Co-operative design[16]. The study is inspired of the use of indicator group from the TED-model [13].

In order to obtain an interface “easy to use”, the design approach aims at letting the affordance factor be guiding the design [11].

3.1 Aim

The aim of this study is to determine how people with limitations in their functioning contribute to the design process in conjunction to other groups. The focus is to making the usability issue simpler to deploy in the design process of creating ITV-services.

The main research question in this study was:

- How does the use of an indicator group influence the ITV design process?

The secondary and more precise question is derived from the first question:

- In which way do individuals with development disability enrich the development of easy to use ITV applications?

3.2 Method

3.2.1 The design method

The design method has its base in UCD and to bring in users as early as possible in the process. Prior to the first graphical design a “quick and dirty” ethnographical users study was conducted as a fast and inexpensive method [17].

The study was conducted by using paper-based prototypes. The usability area of this study was mostly in the area of “Ease of understanding”. Real navigation on the design was not possible due to the designing phase, where not all of the information on the application was available during the testing. This was the first step in the development process, to give the designer some input on the layout and how understandable some of the conceivable functions were.

The prototypes were shown as two proposals delivered by the designer. The main media was the TV. The navigation was supposed to be managed by using a certain handheld control device that came with the set-top box. All the participants were individually introduced to the handheld control and to the paper prototypes.

3.2.2 The data collection method

The method used for evaluation in this study is based on “Think aloud” [7][8]. The method’s main purpose is to let a user describe how to do a specific task. The user is also expected to verbally express his/her thoughts.

An objective is to let the participants express themselves as freely as possible and to let them talk as much as possible from their own point of view. Another objective is to use this method to follow the individual's strategy of using the site. The entire test was conducted in two steps;

First, we asked the participants to “Think aloud” while he/she was looking at paper prototypes. The participants were individually asked to describe how they navigate through the system and to describe their thoughts when navigating through the system.

Second, the participants worked in a workshop where they made a simple prototype. At the end of the workshop there were a focus group interview where they were asked to discuss around about both prototypes and which they prefer and why.

3.3 Participants

The study was made with one indicator group [13] with individuals that have a development disability and two control groups. Two control groups, one group with elderly people and another with school employees.

There were six individuals in the indicator group in the ages between 17 and 20 years old with mild to moderate cognitive disabilities. Four of the participants in the indicator group were female. All the participants were familiar with using mobile phones, Internet and chat. None of the participants indicated that they were technical novices.

One control group where recruited with elderly people (E). There were six individuals in ages between 63 and 86 years. In this group, there were 3 female and as many as 2 of the individuals indicated that they were technical novices.

The other control group with three individuals was recruited from adults working in a school (S). One worked as a teacher and the others worked as teacher assistants, who had no academic background. Two individuals in this group indicated that they were technical novices.

3.4 Result

The result of this study is described in two parts. The first part constitutes some examples of the design outcome of the two steps in the study. The second part consists of a comparison of the result from the indicator group with the other control groups of both steps of the study.

3.4.1 Examples of the Design result

All participants in the indicator group could explain how to navigate by pointing at areas in the prototype. Five out of six individuals in the indicator group had a clear view of how to navigate with the handheld control. This differed, unfortunately, with the designer's idea of how to navigate. The participants in the S-control group explained how to navigate, in the prototype, the same way as the participants in the indicator group. Two out of three in the control group explained how to use the handheld control with the prototype in another way than intended by the designer. In the E-control group four out of six had explained how to use the handheld in the same way.

Both the indicator group and the control groups suggested in the workshop part that the navigation with the handheld control should use the same idea as when you navigate on the Internet. To use the arrows up and down to put the marker on the object that is to be changed. The right and left arrow should be used to



Figure 1 ITV layout

change the values and to decide with the “OK” or “enter” button on the control.

The designer's idea of navigating was to use the number buttons, on the handheld control to change the top menu. By using the left or right button it was possible to change the middle menu (activity) and by using the up and down arrows it was possible to make changes in the right menu (activity).



Figure 2 Web layout

At the first step, the individual part, all individuals in the indicator group, one individual in the S-control group and four individuals in the E-control group were unsure what the green tick and the red cross meant. They could not decide if the cross or the tick were the symbol that meant that something had occurred.

The design thought was that the user should recognize the layout on the Internet as the same as on the television. The main difference between TV and the Internet was that all days of a month, as an example from 1 to 31, was shown just below the head menu as shown in Figure 2. No one in the indicator group did recognize what the numbers were and only one in the S-control group and one in the E-control group described what the numbers were.

Another area that also was discussed in all the groups was the logic of the menu system on the prototypes in a usability perspective.

3.5 Study result

The aim of this study was to find out how the use of indicator groups can influence the design process and to describe in what way individuals with development disability can enrich the development of easy to use interface?

The first question about how indicator groups influences the design process can be illustrated by the following:

- The method of using simple paper prototypes and to let the participants individually talk about what they are thinking seems to be very efficient. Especially individuals with development disability were very focused during the “think aloud” activity. The E- and S- control groups did not have the same focus in the individual parts and they seemed to have some form of psychological/social barrier to speak out loud what they were thinking.
- It seems as the group of individuals with development disabilities easily think aloud around the paper prototypes. For the individuals in the S- and E- control groups it takes some time to get started.
- It was noticed that it takes significant longer time per individual in S- and E- control groups than in the indicator group for both the individual part as well as the group activity.
- In the group activity the differences between the three groups are not significant. It seems to depend more on the group members' way of interacting with each other.

The second question outlined in the objective was about in what way individuals with development disabilities could enrich the development of easy to use interfaces?

- The members of the indicator group came up with a wide range of suggestions, mainly through the group activity, to improvements that were of the kind that all individuals, with or without disability, could take advantage of.
- Even smaller areas of difficulty were noticed by the indicator group, but not in the other groups.

4. Discussion

One result that might come as a surprise to designers was the ease of which the indicator group talked about how they perceived the tested prototype sites. This method of “think aloud” around paper prototypes seems to be very effective for the indicator group. The control groups did not seem to have the same immediate ease to talk about what they perceived about the prototype pages.

The comments from individuals in the indicator groups were more homogenous than the individuals in the E- and S- groups. In almost every question, the indicator group was describing the same difficulties. The E-groups had more life experience, which resulted in someone putting forward a unique point of view in the study. Only using the indicator group had come to the same result as the other control groups together in this study. This could be something that makes the UCD-process easier and shorter.

Also in the S-control group the participants varied more in the individual part in their comments and reflection compared to the indicator group. This could depend on the fact that the participants in the former group varied in educational level and in life experiences.

The indicator group’s impact on the usability issues were actually mostly around the area pointed out in advance; the area of understanding the sites. The understanding of the text was one of the areas that the indicator group had a lot of comments about, probably because it is something that is important in their lives.

The method “Think aloud” was probably a very good way of receiving direct indication on the logic of the menu system. The members of the indicator group have a lack of logical thinking within their defined difficulties, which is probably the answer to why they so effectively point out the difficult parts of the menu system. They pointed this out without trying to describe what the menu item should mean. The members of the control groups tried to describe all the menu items even if they knew it was more or less a guess. This could be one of the things that make the use of indicator groups effective.

With a “design for all” perspective in mind the result indicates that, having people with difficulties participating in the test/design groups, problems within the area of accessibility is automatically included in the process without having to include it separately. This was very obvious when a second prototype were presented for the participants built from the result from the design activity.

In the phase of designing the ITV services the approach using the method with people with difficulties in their functioning seems to be very effective.

This is a preliminary result from a design study which is the first out of five studies of how people with difficulties in their functioning can contribute in the design process. The emphasis of the first study is on using people with development disabilities.

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