Tablets for Seniors – An Evaluation of a Current Model (iPad)

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Abstract. Internet usage in Austria varies between age groups in a way that only about 30% of older users above 60 have access to Internet services compared to nearly 100% in the age group between 14 and 30. This digital divide exists because of technical, social and economical barriers that affect especially older users. Weather or not current tablets have the potential to minimize these barriers was the central question behind the usability study described in this paper. The study undertaken involved 11 seniors (60+) and targeted to evaluate the general usability and acceptance of a selected tablet. The results of the study show high acceptance and satisfaction rates among the user group and hence suggest a future focus on the development of tablet based applications for seniors as well as initiatives to conquer the information demand of the target group.

Keywords. tablet, digital divide, older people, e-inclusion, iPad usability

1 Introduction

Web-based services have become an essential part in everyday work and private life. Nearly 100% of the Austrian population aged between 14 and 30 years is making use of web services, but for those aged 60 years and above, Internet access is still very limited. According to recent studies by GfK Austria [1] and the Initiative D21 in Germany [2] only one third of the population above 60 years uses the Internet.

The resulting „digital gap“ excludes elderly people from parts of public life. High entry thresholds are among the main reasons that keep older people from using the Internet. Those thresholds include high respect of new technology caused by a lack of experience and the fear of depending on technically more experienced people in case of possibly occurring problems. Technical hurdles like highly complex user interfaces, high acquisition and maintenance costs are further major barriers for Internet newcomers. [3,4,5]

1.1 The Project MyTablet

The main target of the project “myTablet”, funded by the Internet Foundation Austria, was to evaluate if the current generation of tablet PCs like Samsungs “GalaxyTab” or the Apple “iPad” could lower the barriers to access the Internet. Therefore the hy-

pothesis was introduced that people aged 60+ without previous experience with personal computers and Internet profit from using tablets because of their less complex user interface when compared to a PC.

To validate this hypothesis a usability study has been conducted together with eleven (n=11) elderly people within the "Living Lab Schwechat". The following chapters describe the methodology used and results gained during this study.

2 Usability Study

The study was based upon the following research questions:

1. How do the test users rate the usability of the device in general and the user interface in particular?
2. Is it possible for the users to use the most common Internet applications such as information research and communication via e-mail on the tablet independently after only getting a short introduction to these features?
3. How extensive does this introduction have to be to enable Internet newcomers to use these basic functions independently?
4. What are the perceived advantages and disadvantages of the tested technology / the device?

2.1 Description of the Trial Participants

Inclusion criteria of the target group were people above 60 years (age > 60) without previous Internet or PC experience, but a general interest to start "getting online".

A group of seniors at the same age who were already using the Internet have been included into the study as well to be able to draw comparisons between experienced Internet users and newcomers and to gain feedback about the differences in using a personal computer and a tablet.

In total 11 persons (n=11) with an average age of 71 years have been involved in the study, four of them male, seven female. Five participants already gained at least basic experience in using the Internet via a PC, six did not have neither experience with a PC nor the internet.

2.2 Methodology

Single user interviews were conducted to evaluate the scientific hypotheses. During the interviews the users were asked to complete concise predefined tasks by using functions of the tablet. The tests were recorded by video and notes were taken by the test supervisor during the task completion for retrospective performance analysis.

2.3 Test Setting

The Apple iPad 1 was used as an example of a tablet since it is leading the market and user studies with a broader target group are already available as reference [9,15]. **Fig. 1** shows the test object and the test setting during the single user study.

Fig. 1. Test setting during the single user interviews

Prior to the test the tablet was customized to meet the needs and interests of seniors based on a previously conducted requirements analysis. Appropriate applications were selected, system applications that could confuse the participant were hidden and system settings were preconfigured as far as possible.

The following applications were considered as central and chosen for the test:

- Safari – web browser
- Mail – email client
- Karten – Google Maps application
- Youtube – video sharing portal
- Billa – online portal of a well known supermarket chain in Austria
- Fotos – picture viewer
- Quick-links to: weather, news and Google search.

The following **Fig. 2** shows a screen shot of the user interface used for the test including the installed applications

Fig. 2. Screenshot of the main user interface

2.4 Test flow

The test was split into three parts; an introductory part, the main part including the execution of test tasks and a final part including also a final survey.

During the introduction the project and the tablet were explained to the test user. The explanation of the tablet followed a predefined workflow including all necessary information to conduct the following user tasks.

Directly after the introductory part the users were asked to perform predefined tasks while verbalizing their thoughts according to the "thinking aloud"-method [6,7]. For more complex tasks, scenarios were used to further visualize the goal of the tasks to the user. One example of the used scenarios:

- „Imagine that it's flu season and you are not sure whether you should get a vaccination or not."

The purpose of using such scenarios was to create a situation where the user could make use of the device during his / her daily life so that the assigned tasks make more sense to him / her. One task for the above-mentioned scenario has been:

- „Please search for information about flu vaccinations in the internet."

Every task consisted of several certain steps that needed to be done in the correct order to fulfil the task correctly. Each step has been observed and logged for evaluation by the researchers conducting the study. The researchers did not influence the test participant while performing the task, but in case of problems the user could not overcome, a small hint was given following the „obtrusive observation" approach [10] so that the person could continue with the task.

To be able to set a relation between the objective observation of the researcher and the subjective feeling of the test participant, the user was asked after each task about his / her personal impression on performing the task:

- „Did you have the feeling that this task was difficult?“ / „Did you experience some ambiguities while conducting the task?“

Each participant has performed the following tasks:

1. Turning on the tablet and looking for the weather forecast using a quick-link on the home-screen
2. Retrieve the latest news (via a quick-link on the home-screen)
3. Searching for information on selected predefined topics using Google-search
4. Finding an address on a map (using the Google-maps application)
5. Reading an e-mail
6. Writing an e-mail to a predefined recipient
7. Searching for a predefined video on YouTube

Subsequent to the tasks a qualitative interview [8,9] has been conducted to discuss central usability aspects like readability of the elements on the screen, ease of use of the gesture control and the virtual keyboard and to get general feedback about the device and its features.

2.5 Results

In the following paragraphs the knowledge gained by the general course of the trial, the conduction of the tasks, the final interviews and the user comments during the whole test procedure is summarized.

Test flow. Depending on the previous knowledge the introduction to the tablet and its features took between 15 and 40 minutes per test participant. Surprisingly the amount of time needed to perform a certain task did not vary much between experienced Internet users and newcomers. The average time to conduct all tasks was about 60 minutes including the interrogation after each task and further explanations. This means that every participant has been using the device for about 1,5 hours before answering the questions of the final interview.

Performance results. Both experienced and novice users have been able to understand and independently conduct the assigned tasks after a short introduction. As expected it showed that Internet newcomers made more mistakes than the experienced user group. For more complex activities like web browsing and writing e-mails a more detailed introduction would be essential. The following circumstances highlighted this fact:

- The representation of web links can vary largely between different websites (they might look like a button, like a picture, have different text styles) therefore they are not always perceived and recognized correctly. Especially selecting the right link in Google-search results has been very difficult for novice users.

- Simpler applications and features such as gesture control were quickly learnable and useable by the target group. Especially the intuitive usage of the so called „pincer gesture“ – a gesture using index finger and thumb to enlarge areas on the screen - has been astounding. Some participants even used this gesture as a solution to enlarge small web links on the screen without being told that it could be used for this purpose.
- Unfortunately anglicizes cannot be avoided completely when using the World Wide Web. This became a hurdle for some users lacking knowledge about the English language. For example some users had problems associating „YouTube“ with watching videos.

The following difficulties are caused by misunderstandings of the tablet's user interface, which can be applied in a similar way also to Android based devices:

- For some users it was hard to distinguish between „back to the main screen“ and „back within the web browser“.
- The way input fields work is not easy to understand for novice users. (Tapping into the input field to activate the virtual keyboard and then press „enter“ to start a certain process)
- While writing an e-mail worked quite well for all participants, some complained that the feedback given by the tablet when an e-mail has been sent was not clear enough.

In case a problem occurred during a task, the correct solution was explained once more to the participant to avoid an influence on the test results by repeating the same mistake more often. In fact most of the mistakes did not occur in later tasks anymore.

General Usability of the Device. All users stated that the tablet in general was very easy to use, although most novice users added that it takes a little time to get used to the handling of the device, but it was easier and faster than they expected because of the logical workflow and manageable functional range. „When you've exercised a bit, it's easy – you just have to learn what happens when you press on a certain item.“ „You just try and hope that it's right and most of the time it's right.“
It was highlighted as a positive attribute that the device is not intimidating as it does not look like a complex machine.
Although all experienced Internet users said that the tablet was very easy to use, only half of these users would prefer to use a tablet instead of a common personal computer. It was stated that some tasks are more complicated to perform using a touch screen and that the integrated e-mail-client was not as intuitively usable as the one they are used to. It was emphasized, as a positive aspect that starting an application works very easy and faster than on a PC. „You tap on it and the application launches immediately.“

Central Aspects of Use. The participants were asked to rate the following aspects in the use of the tablet according to the scholar system i.e. from „very good“ to „fail“: (the value in brackets shows the rating)

- Readability (very good)

Being able to enlarge the screen content as required in an easy way resulted in the highest mark („very good“) for readability. „Reading is magnificent, because you can enlarge anything you want.“ The easy to use magnifying feature thus became an important additional benefit in comparison to a conventional PC for this user group.

- Writing (good)

It was highlighted positively that the letters on the onscreen keyboard were quite big, but writing itself was not that easy for many users – especially when they were not used to typing on a typewriter. Although writing took quite long for those participants they were positive that it would improve after some time of practice.

- Gesture control (good – very good)

Some participants had slight problems when tapping on the screen. Remaining too long at the same screen position automatically triggers secondary functions such as „copy / paste text“; swiping slightly with the finger when tapping often makes the gesture unrecognizable for the tablet which can be a problem for people with tremor.

Enlarging and minimizing screen content using the pincer gesture worked out very well for all participants and has been rated as very easy and intuitive (those who had motor disabilities in one hand just used both hands to perform this gesture) as well as scrolling and turning pages by swiping with a finger.

3 Conclusion & Discussion

The results of the usability study showed that tablet PCs really can lower some of the initially mentioned hurdles to access the internet and therefore make it easier to use online services and „make a step into the digital world“ independently for people who are inexperienced in using a PC, in using the internet or both. Due to the limited number of participants (n=11) only qualitative conclusions could be drawn.

An essential advantage to conventional PCs proved to be the non-complex, less technical and less daunting look and easy handling of the device, which are both primary reasons for the high respect this user group has for technical devices.

Additionally the touch screen interface and the lower amount of features enabled even Internet newcomers with low technical interest to use the device.

All participants reported that they had a very positive impression of the tablet. The possibility to autonomously learn new features furthermore made some people state that they now feel more confident in technical solutions in general.

Some general hurdles could not be overcome by using the device alone. The device had to be set up especially for the study and the participants got an initial introduction, which would usually not be the case after buying the device in a shop. Hence support is still necessary in a real life scenario and could be given by a friend, a relative, a carer or an institution.

4 Outlook

At the time of the study (1st quarter 2011) there have already been numerous applications for the test device in German, which can typically be found in AAL research projects like cognitive training games to prevent dementia. Tablets thus could soon contribute to bring research projects in the field of AAL to market in an easier way and in this way lower the gap between market and research. In future projects of the research institute CEIT RALTEC this approach will be intensified.

Special tablet PC courses targeting elderly people similar to those already offered for laptop and PC would facilitate the access for this user group. According to the study described in this paper telecommunication provider could benefit from offering a tablet especially designed for elderly people.

Acknowledgements. Special thanks go to our test users for their active participation. The work done in the project "myTablet" has been funded partly by the „Internet Foundation Austria (IPA)". CEIT RALTEC is a non profit research institute partially funded by the municipality of the city of Schwechat.

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