

# Testing Silver Surfers

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## Abstract

Silver Surfers show constant growth rates in the usage of the internet and touristic internet services. This paper investigates specific user behaviour of senior people while being tested in a Usability Lab. The methodology of "Thinking Aloud" and "Retrospective Review" are compared with each other in terms of acceptance, utility and specific outcomes. In order to optimize web based booking platforms, Silver Surfers – who show constant growth rates in the usage of the internet and touristic internet services – should be tested in an adequate way. To be able to optimize web based booking platforms in the future, first recommendations for Usability Test Settings are formulated.

**Keywords:** Silver Surfer, Web-Usability, Think(ing) Aloud, Retrospective Review.

## 1 Introduction

According to socio-demographic studies, our society is constantly growing older in the next four decades. The Generation 50+ can be described as a very sophisticated but wealthy target group with high expectations, also towards usage of internet services (Pompe, 2007). Recognizing the "Digital Divide" – the unequal access to computers and the Internet caused by such social and economic factors as gender, income, race and geography - as an underlying concept (Wicks, 2003), internet usage has grown rapidly among this generation over the last few years. From 2004 to 2009 the amount of Internet Users above 60 grew considerably from 14,5% to 26,4% in Germany. The largest growth rate in the age group 60 to 79 could be recognized from 2007 to 2008 with 11%. The main reasons for this are: improved and more usable internet and software applications going along with affordable broadband flat-rates and a more technology-interested generation (van Eimeren & Frees, 2008). Although these numbers have been promising, this fast pace has not been proved stable according to a relatively small increase to 27,1% from 2008 to 2009 (Gerhards & Mende, 2009).

Silver Surfers tend to be newcomers to the internet. Being a first-time visitor, the importance of a usable web interface seems obvious. Studies show, that the Usability of hotel sites by first-time visitors significantly affects their purchase intentions and overall online quality perceptions (Kim & Kim, 2004; Oh, Jeong & Gregoire, 2003).

Older people are inclined to be portrayed as hesitant to adopt new technologies and in general feel uncomfortable using them (Vuori & Holmlund-Rytkönen, 2005). Analysis asserts that their openness towards new technical development is closely related to whether they can perceive advantages by adopting them, and whether or not these advantages can be perceived as meaningful (Menchin, 1989).

In terms of information quality, providing the visitor with false or contradictory information is the main reason behind abandoning the purchase of online hotel products (Matzler & Waiguny, 2005). Defining Usability as: “[...] how well and how easily a user, without formal training, can interact with an information system or a website” (Jordan, 1996), retrieving information or even finishing a booking process should be accomplished with the least time and cognitive efforts possible (Krug & Dubau, 2006). According to international studies, the user-friendly implementation of web-based offers like for example eShops or eCommerce solutions, positively influences customer satisfaction as well as sales (Nielsen, 2008). Recognizing the importance of Usability and therefore Usability Tests for touristic websites, conducting them in a very customized and adapted setting, seeing Silver Surfers as a target group of growing importance, the question arises: Are Standard Usability Test Methods actually appropriate to test Silver Surfers?

## **2 Theoretical Background**

As the Internet develops and plays a critical role for the competitiveness of tourism organisations and destinations in attracting their customers (UNWTO, 2001) tourism organizations can target prospective travellers more consistently via the web. This development has changed tourism consumer behaviour dramatically, giving a potential tourist direct access to information provided by tourist organizations and increasingly by other travellers / customers (Mills & Law, 2005). Consistent use of ICT in tourism can be helpful in improving service quality and overall customer satisfaction and placing the user in the centre of a touristic product’s functionalities and product delivery (Buhalis & Law, 2008). Users already search for travel-related information before the trip, book their air-ticket online, reserve their room online, and purchase other related services and products themselves instead of relying on travel agencies to undertake this process for them (Morrison, Jing, O’Leary & Lipping, 2001). Already flight information and accommodations range among the most searched topics by Silver Surfers (Vuori & Holmlund-Rytkönen, 2005; Gervy & Lin, 2000), with most of them not interested in packaged holidays (Graeupl, 2006).

### **2.1 Silver Surfers**

Internet users above 60 have to be seen as a unique target group with a special online behaviour. According to surveys half of the targeted group over 65 stated, that they do none of the top four activities on the net (i.e. shopping, sending/receiving non-work related emails, visiting general interesting sites, looking up local information) (Leisure Intelligence/Mintel, 2000). According to a study by the EIAA among a wide array of websites and topics, travel and holiday sites are particularly popular with this

group – travel sites 60%, holiday sites 55%. This can be seen as an indicator of this group's increased leisure time and disposable income for enjoyment purposes (EIAA - European Interactive Advertising Association, 2007). These results are still corresponding with a survey by Vuori, stating that two products or service categories had most responses: making hotel reservations followed by buying tickets, with a total of 50% who tried or used such kind of online service. Older adults who shop online even consider it unfair, that many services are available on the internet for free, but are charged for at a physical service counter (Vuori & Holmlund-Rytkönen, 2005).

Silver Surfers prefer buying products online over surfing for information online (Szmigin & Carrigan, 2000). Although making an online purchase is problematic and difficult as they lack experience of computers or the internet, they prefer functionalities that make online-navigation easier and more convenient (Clever, 1999) and prefer websites that make it easy for them to use and be successful (Coyne & Nielsen, 2005). "Usability for seniors is important; it lets them perform tasks, which increases their satisfaction and the likelihood that they'll return and form a long-term relationship with a site." (Coyne & Nielsen, 2005, p. 16)

Age in itself is clearly not a barrier for being active on the internet. Many older people can be regarded not only as users of digital technologies, but as fully "digitally engaged". (Olphert, Damodaran & May, 2005). Silver Surfers can be positively described as remaining active and independent, trying to keep mentally alert, challenged, useful and feeling „younger“ (Loges & Joo-Young, 2002; Trocchia & Janda, 2000). On the contrary lack of experience and support are relatively more likely to produce negative experiences, posing a significant factor in computer anxiety (Todman & Drysdale, 2004). Anxieties range from simple feeling "too old" for new technologies (Selwyn, 2004), perceiving the internet as a threat, being insecure and dangerous, resulting in shorter online times and more cautious surfing behaviour (Olphert et al., 2005) to worries "about what to press". As a result many users prefer to ask for help rather than solve the problem themselves (Bailey, Barrett & Guilford, 2005). In addition Bailey et. al. found that contrary to popular belief eyesight and motor control do not pose too many problems for older adults at all. The main areas of difficulty appear to be conceptual, not having internalized any tool to support understanding or to make informed guesses about progress through a website. Nevertheless older consumers do not want to be constantly reminded about their deficiencies by internet sites that sell themselves on their ease of use (McLuhan, 2000). Considering adults over 60 as an important target group for further scientific research, experimental HCI research rarely reflects demographic reality to successfully and precisely design ebooking platforms and etourism initiatives,. Mainly student participants are tested, deducting usability guidelines and implications for all age groups who access a website (Dickinson, Arnott & Prior, 2007).

## **2.2 Usability Methods**

Coyne & Nielsen (2005) and Dickinson, Arnott & Prior (2007) outlined obstacles concerning usability inspection with seniors, though not in the context of etourism. Nevertheless, beyond doubt abilities like visual and auditory perception and fine

motor control decrease with age. Furthermore this specific user group also shows a significant decline of concentration, perception, interpretation, and memory retention (Schulte, 2005). Whereas Coyne & Nielsen (2005) solely focus on designing Usability for seniors, Dickinson, Arnott & Prior (2007) indeed question the methods used for testing Usability with seniors considering (or: against the background of) above mentioned obstacles. However, the perspective study does not include an entire Usability Test Setting – as described in the following - for seniors. They were merely asked to do a Retrospective Review after looking at a website for 20 seconds.

### 2.3 Usability Inspection

Usability Inspection comprises methodologies for measuring usability aspects and identifying specific problems. In general two different approaches can be distinguished: (1) expert based inspection, and (2) user based testing methods (Jaspers, Steen, van Bos & Geenen, 2004). Table 1 shows a quick overview of the most widely adopted methods. Other existing methods – including for example Programmable User Models or Facial Expression Analysis – are not very common due to their complexity. According to Nielsen (2005) the most effective way to measure Usability is the Formal Usability Inspection. The Formal Usability Inspection is – following the Mixed-Methods-Approach - a combination of both qualitative and quantitative methods as well as Expert Based and User Based methods to examine a website's Usability in a clearly structured Test Setting.

**Table 1.** Usability Method Overview

<b>Method Type</b>	<b>Description</b>
<i>Expert Based Inspection Methods</i>	
<b>Guideline Review</b>	Expert checks guideline conformance.
<b>Heuristic Evaluation</b>	Expert inspects heuristics.
<b>Consistency Inspection</b>	Expert checks consistency across products.
<b>Cognitive Walkthrough</b>	Expert simulates being a user.
<i>User Based Testing Methods</i>	
<b>Performance Measurement</b>	Usage data is recorded during test.
<b>Log File Analysis</b>	Usage data is analyzed.
<b>Interviews</b>	User participates in a discussion.
<b>Questionnaires</b>	User answers specific questions.
<b>Participatory Evaluation</b>	User works through task scenarios and explains the actions.

(Jaspers et al., 2004; Ivory & Hearst, 2001; Maguire, 2001)

In the present study all methods mentioned in Table 1 were used. Nevertheless only the User Based Testing Methods are being put into question concerning Usability Testing with Silver Surfers. Expert Based Inspection methods have already been proved suitable in previous examinations (Mirski, Groth & Schlögl, 2006; Bernsteiner, Mirski & Schlögl, 2006) and are not subject to change in the context of testing with seniors.

Therefore this special context requires slight adaptations regarding the age-related decline of abilities for the first four methods (Performance Measurement, Log File Analysis, Interviews, and Questionnaires). The main challenge though lies within adapting the Participatory Evaluation in a way that is suitable for seniors. For the Participatory Evaluation the user has to work through task scenarios and explain the actions performed – either by “Thinking Aloud” or “Retrospective Review”.

### **Thinking Aloud**

For the method of “Thinking Aloud” test-subjects are urged to speak their thoughts out loud (Frommann, 2005), which allows for insights into the personal thoughts of a person, and therefore insights into their thinking processes. This can lead to a better understanding of the subjective perception. The task of the test conductor is to repeatedly remind the test-subjects to Think Aloud in case they fall silent. The resulting data pool is usually highly valid, since not only the actions of the participants are shown, but also the reasoning behind those actions (Harms & Schweibenz, 2000). Restrictions also have to be made regarding the cognitive system. It is assumed that a person is only able to express thoughts processing in the short term memory (Jaspers, Steen, van Bos & Geenen, 2004). Due to those reasons, the method of “Thinking Aloud” only qualifies for certain tasks. For example: those having to do with the order of information requested in accordance with the order of the task to be completed, or those only dealing with information directly concerning completion of the task (Jaspers et al., 2004). Furthermore thought processes proceed faster than people are able to talk. Due to that, the actual thoughts can only be enunciated at a fraction (Eger, Ball, Stevens & Dodd, 2007). Since this seniors tend to show a significant decline of concentration, perception, interpretation, and memory retention (Schulte, 2005), the method of “Thinking Aloud” has to consider these possible limitations in analyzing the data. These limitations could also be perceived as additional stress factors.

### **Retrospective Review**

The “Retrospective Review” or “Retrospective Think Aloud” is a method that collects the thoughts on the task of the user after this task is over (Guan, Lee, Cuddihy & Ramey, 2006). Participants perform the given tasks silently and are afterwards asked to verbalize their cognition and emotions. The main advantage of this approach is that the double challenge resulting from thinking and acting in a parallel way is avoided (Gediga & Hamborg, 2002). Ohnemus and Biers (1993) compared “Thinking Aloud” and “Retrospective Review” regarding effectiveness and efficiency and came to the conclusion that the data acquired through a retrospective interview generates information of higher qualitative value. A conclusion also supported by Dickinson (Dickinson et al., 2007). Although in most studies a difference between the two methods could not be detected (Bowers & Snyder, 1990; Eger et al., 2007; Guan et al., 2006). Concerning the method of “Retrospective Review”, better results can be generated when the interview takes place right after the completion of the task, because most of the relevant information is still available at that time and thus can be verbalized directly. Still, the method’s main problem is the reliability of memory. The

processes of encoding, storage and recall are affected by generalization, manipulation and forgetfulness. Also spontaneous thoughts emerging during the performance of the task are also very likely to be lost (Eger et al., 2007).

### **3 Methodology**

A Web-Usability-Test focusing on searching and booking behaviour on touristic websites was conducted. The goal of this study was to observe obstacles for older people while booking on an etourism website. Therefore a Formal Usability Test Setting was applied. Initially an Expert Review including Guideline Review, Heuristic Evaluation and Cognitive Walkthrough was conducted. Subsequently a User Based Test was performed, where Performance Measurement, Interviews, Questionnaires (e.g. demographic data, computer skills and the System Usability Scale/SUS Brooke) and the Participatory Evaluation came into operation. The tested user-group consisted of ten Silver Surfers (average age 65,4 years) and a control group of ten Tween Surfers (average age 26,3 years). All subjects were asked to search for a holiday on the TUI.at website in a specific time of the year and were given a budget of 1200€ to book a holiday according to their likings. The task was counted complete, when the subject reached the page to fill in all the necessary data (credit card information etc.) for completing the booking process. For the evaluation each test subject was situated in a Usability-Lab, in front of a Computer, and an Eye-Tracker and was thereby monitored, and at times helped by the test conductor. During this process the screen content and the Gaze Plot were recorded. With this method it was possible to define Hot Spots – certain areas of very high interest and thereby get an overview of the test- subject's handling of the website (Stoessel, 2002). Five participants of the user-group and five participants of the control group were asked to Think Aloud while searching for their holiday and were observed by the test conductor sitting next to them. The remaining participants were asked to give a Retrospective Review after the completion of the task.

### **4 Results**

Expected results have shown that Silver Surfers stayed almost three times longer on the starting page to search for information than the younger generation. As the TUI.at web page contains all kinds of travel and booking information in various colours and forms to support visitors taking a holiday, it took them 220 seconds in average to scan the front page of TUI.at for any helpful information. The younger control group only needed 79 seconds in average to scan the front page and continue their search. In addition Silver Surfers needed 348 seconds in average to display an overview of possible hotels, they wanted to stay in - three times longer than the younger user group (123 seconds). SUS values have shown 48/100 (not acceptable according to Bangor - Bangor et al., 2008) for Silver Surfers and 65/100 (just acceptable) for the younger generation. The distraction rate was high, requiring the test conductor to give hints and helpful tips when reaching a dead end. Communication difficulties have been noted, as older test subjects were confused interpreting terms like "Going Back". Task completion rate for Silver Surfers resulted in 70%, mainly due to heavy support

by the test conductor - without whose help no Silver Surfer could have completed the task.

Silver Surfers took an extensive time to read through all the information, possibly due to their inexperience with tourism website design and information structure. According to our observations, older test subjects had difficulties in comprehending all the information on the screen, understanding the underlying concept of searching, browsing and booking, accurately moving the mouse to click on smaller formatted links and form fields. By contrast the younger control group did not show demonstrative conspicuities. Difficulties for Silver Surfers were also shown concerning the Participatory Evaluation. The participants of the Thinking Aloud group had major problems completing the given task, and at the same time verbalize their thoughts, which could be explained due to age-related decline in the ability to concentrate. Also the senior participants of the Retrospective Review did not seem to be free of troubles. After completing their task, test subjects had difficulties reproducing the steps they had to take to reach their goal, as already noted by Dickinson (Dickinson et al., 2007). However, the data gathered during the evaluation was less distorted and therefore of higher quality for analysis with the method of Retrospective Think Aloud.

While performing the Usability Test, other indicators have been noted unexpectedly. Silver Surfers needed all kinds of repeated intervention to Think Aloud again, as they had to concentrate very hard on their current task and fell silent quite often, compared to the younger control group, almost having no trouble in solving the given task and thinking aloud while surfing. At times the Silver Surfers reacted aggressively towards the computer itself, insulting the machine, for not doing what they actually wanted it to do. In addition test subjects started talking loudly to themselves, obviously not intending to "Think Aloud" as instructed.

## **5 Conclusions and Further Research**

While conducting the experiment with Silver Surfers using the method "Thinking Aloud" irregularities and possible obstacles have been noticed. A strong connection between the test method used and the tested user group may be suspected since older people tend to have natural difficulties in engaging in various activities at the same time. A similar assumption may be suggested for this special user group, when focusing their concentration on a task they are not familiar with, and at the same time verbalizing their thoughts. The test method "Thinking Aloud" may be in question as an adequate testing method for Silver Surfers. The method of "Retrospective Review" may provide a useful alternative for testing this very special and characteristic user group. Following this method participants are allowed to concentrate solely on solving the given task and their problem solving strategies are allowed to flow freely. Still, senior users have trouble in remembering every single step while booking, nevertheless verbalizing satisfaction with the site and the used functionalities.

Standard qualitative research methods may not be appropriate to yield all the important information and identify key success factors to help Silver Surfers in completing necessary tasks successfully. Additional methods for analyzing the retrospective protocol and the focused interview after the test will be developed in order to improve website design of tourism websites. GABEK (Zelger, 2008), as an advanced qualitative research method is proposed, providing a number of analysis steps in order to collect unordered knowledge and systematize it. This data is provided by normal language utterances, notes, quotations, texts, which are processed and presented systematically. Recognizing the constant increase of senior computer users endeavouring to use the Internet and being especially interested in travel and leisure information websites, testing this user group may prove very necessary for future touristic webpage design. As literature shows, improving satisfaction within this user group, especially in the context of tourism platforms and successful booking experiences, is vital in building a loyal customer clientele.

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