

# Usability Testing of Services offered through the Internet – Results of a Preliminary Study with Internet Banking

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## Abstract

The commercial purposes of the Internet have been increasing due to the delivery of services to customers by several organizations. Therefore, special attention should be paid to ease of use, attractiveness and minimal training needs of the systems.

This paper addresses the problem of usability testing for Internet based service channels. It also describes a preliminary experiment that was carried out with students at FEUP – Faculdade de Engenharia da Universidade do Porto. This experiment and the lessons that were learnt will be the basis for proposing a more complete usability test for a prototype of a new Internet Banking System with real customers – users and non-users – of a Portuguese Bank.

The experimental work has highlighted several key issues for conducting usability tests as well as some problems regarding the tested system.

## Keywords

Usability testing, Web interaction

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## 1. INTRODUCTION

According to [Goldsborough01], the development of the World Wide Web is being driven by technology and not by the improvement of the existing solutions, making them easier to use. The number of available multimedia technologies for web site development, and the interest of designers and engineers in using them, is relegating the importance of making the user experience satisfying for a second priority. This perspective has been changing but a lot has still to be done [Moeller02].

Organizations that currently sell product and services increasingly offer their clients the possibility of access through the Web. Internet users must be offered consistent access through all contact channels, and cannot be expected to take specific training on how to use the organizations' Web interfaces.

Usability testing plays a crucial role in the interaction design process [Preece02, Kuniavsky03], and must take into account that Web based business-to-consumer (B2C) systems are targeted to the general public.

This paper addresses the problem of usability testing for Web interaction. It describes a preliminary experiment that was carried out with students at FEUP – Faculdade de Engenharia da Universidade do Porto, with the Internet services of a Portuguese Bank. Such experiment aimed at preparing a more complete test for a prototype of a new Internet Banking system with the real customers

– Internet users and non-users of a Portuguese Bank ([Patrício03]).

This preliminary experiment included a pilot test ([Nielsen93]) and a final short test. In the end it became evident that improvements should be introduced in order to make the tests more effective.

## 2. PREPARATION OF A USABILITY TEST

According to [Kuniavsky03] the preparation of a usability test is divided in the following parts: profiling the audience and define their goals, elaboration of tasks that address those goals and finding the right people.

One of the most important steps is finding the right people, using randomly distributed questionnaires for example. Meaningful results can only be obtained from the test when the users that test the system are close enough to the profile by which they were chosen. Nevertheless, [Rubin94] states that some least competent users should also be used.

Usability tests for web systems also face the challenge of finding adequate users from the overall population of customers (and eventually non-customers).

## 3. OBSERVING THE USER

After having a group of users to test and the tasks, the next step is observing them performing those tasks. The user is asked to comment the product alongside the interaction, pointing out the problems of the interface and making suggestions. Even when asked to do so, users

normally do not talk when left by themselves in an empty room. It is therefore advisable to have a monitor during the evaluation process of the system to induce the user to talk ([Rubin94]).

Because external interference should be minimized, the role of the monitor should be restricted to trying to understand the user's behaviour and thinking through the *thinking aloud* technique. Due to the difficulty of this, it is sometimes desirable not to use a monitor unless a highly trained one is available. For this usability test, it was decided to analyze the influence of a monitor in the user's behaviour. One of the tests was done with a monitor and the other one without him.

Although this experimental test involved only two users, it was evident that the monitoring behaviour has a strong impact on the results of the usability test, and careful attention should be paid to the monitor's training as well as the planning of the interaction process with users.

#### 4. PREPARATION OF THE INTERNET BANKING USABILITY TEST

The goal of this test was to evaluate the procedure of usability testing using an Internet Banking (IB) system.

The population for this test was first year students of Information Science: an undergraduate course jointly organized by the Faculty of Humanities and Engineering. From this group some students were selected using the criteria presented later on.

In order to be selected for the test, the user should meet the following criteria: be a first year student, use the Internet frequently and should not know any detail about the system being tested. Therefore, the candidates should not be technology oriented and should not be users of the IB system. The goal of the test was to identify potential problems regarding the procedure.

A questionnaire was given to the target population (about twenty students) to determine their technological readiness [Parasuraman00], their use of new technologies like Internet and IB, and detailed demographic information. The next step was determining the Technological Readiness Index (TRI) for each student. TRI is a measure of a person's motivation to use new technologies. It was used in this study to determine the users' familiarity with technology. This is an important selection criterion because it will assure that both technology ready and non-technology ready participants will test the system. After having the users sorted by their TRI it was decided to discard outliers and to segment the population in three groups: low, average and high TRI users. Another condition that was checked was if the users with low TRI had low Internet usage, and if users with high TRI had high Internet usage. This additional condition was used to choose *consistent* users.

After selecting the users, the tasks they would carry out during the pilot test were defined. Due to time and scope restrictions it was decided to design tasks whose goal was only to obtain information about the bank, its products

and services. More complex interaction would require, for instance, the use of real or simulated bank accounts.

After the pilot test was done it was found that some of the tasks were open ended. Three new tasks were defined:

- Determining the variation of a stock price in the stock market.
- Determining the cost of transferring money between two accounts of the same bank.
- Simulating a loan for a car.

Although the selection of bank customers should include other variables of interest, such as socio-demographics, using the TRI measure on a selection of customers could be useful in determining candidates for testing the new IB prototype in order to make sure that technological and non-technological ready customers participate. As TRI measures customer's readiness to use technology, selecting customers with different TRI levels would allow the identification of usability problems specific to technology laggards and to technology experts.

#### 5. DOCUMENTS FOR THE USER

The user testing the system was asked to sign some documents before starting.

The first document was a standard non-disclosure agreement by which the participant concurred with the non-disclosure of the information obtained through this test. The document was adapted from [Aveiro01]. The second document was a consent form by which the participant declared agreement regarding his rights, the tasks to be done, the recording of the interaction with the system and the confidentiality of all the information gathered. This document was adapted from several sources [Duffy01, Fisk97, InfoDesign03, Lazar03]. Both documents were reviewed by the legal department of FEUP.

Obviously, in the case of actually testing the new IB prototype, the legal department of the bank would also revise the documents.

#### 6. EVALUATING SATISFACTION

After concluding the test, the user was asked to fill a satisfaction questionnaire regarding the system [Chin88]. The user was also asked some questions regarding his behaviour when interacting with the system. Finally the monitor asked the user about suggestions regarding the test or the evaluation process.

#### 7. PHYSICAL ENVIRONMENT

The user should test the system in a situation that is as close as possible to the real one. Although not being the best scenario, it was decided to use a normal classroom as the observation room and a small room near it as the test room.

Each observer – final year students of an HCI course – had a form to be filled in with relevant information regarding the behaviour of the user.

## 8. IMPROVEMENTS REQUIRED

After finishing the test, several improvements were identified that could have made the testing procedure more effective:

1. Making sure selected candidates show up. Several people did not show up; it is essential to improve success at this stage.
2. Providing some kind of entertainment for the candidates would be an option.
3. Rewarding adequately participants in such a lengthy test.
4. There should be a larger number of candidates to start with.
5. Making sure the resolution of the video signal is good enough to show high resolution images coming from the computer screen.
6. Making sure that the microphone used captures only the voice of the user and not the ambient noise.
7. Testing the technological setup the day before the test.

The experiment showed that making the test room and the monitor's script more informal is important because they make the participant more comfortable. It also showed that the task definition should be more clear regarding the goal of the task, in particular making it easier for the user to recognize the end of the task. Finally, the monitor should be able to get feedback from the observers during the user's interview.

## 9. RESULTS

It is evident that usability testing is better than no testing at all. Even with limited resources, doing a small test returned valuable input from the users that could otherwise go unnoticed.

In this small test several problems related to the system were identified:

1. The participants changed the values of some combo boxes in the loan simulator and did not become aware of that fact.
2. The loan simulator did not show the assumptions for the calculations. Some participants gave, by mistake, incorrect information to the simulator and were unable to identify the error, because the system did not show the parameters used for the calculation.
3. Some of the instructions were difficult to interpret by the participants.

## 10. CONCLUSIONS

Regarding the experience from a pedagogical point of view, it can be considered a success since the observers (students) were able to notice the problems that might appear in usability tests with a practical example. It should be pointed out that the improvements presented above were also identified by the observers. This obviously shows their understanding of the process and the

implications of every little detail. This means that the overall setup is important as well as details.

This experiment also allowed the identification of major improvements for future tests with bank customers, in terms of the user recruiting and selection process, the physical space of the test, the interaction with the users and the technological setup.

The recruitment process and personal interaction with bank customers, users and non-users of the Internet services of the Bank, deserves special attention, as customers' willingness to participate is crucial for the study's success. From the Bank point of view, the customers finally selected for the usability test must also find it to be an overall enjoyable experience.

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