

USABILITY EVALUATION: A METHOD FOR A SPESIFIC FIELD

Canan Akoglu
Research Assistant,
Yildiz Technical University, Istanbul, Turkey
Faculty of Art and Design,
Department of Communication Design

Abstract

In this paper a case-study held on usability evaluation method for architectural web sites is introduced.

Target user groups of the case-study are architects and students from department of architecture. It is possible to talk about other users except from target user groups such as designers of web sites and another group of which members visit architectural web sites with or without any reason. Starting out from this point of view, target users were determined to be students from Istanbul, Yildiz Technical University(YTU), Faculty of Architecture, Department of Architecture and architects working as professionals. It was also determined to have another group who are supposed to be designers of web sites from Istanbul, Yildiz Technical University, Faculty of Art and Design, Department of Communication Design. In addition to these two groups a general user group was constituted. Usability tests were conducted to 13 architects and 16 students from YTU Department of Architecture as being the target user group, 17 students from YTU Department of Communication Design as being designers of web sites, and 6 people representing the general user group with a total number of 52 (Figure 1).

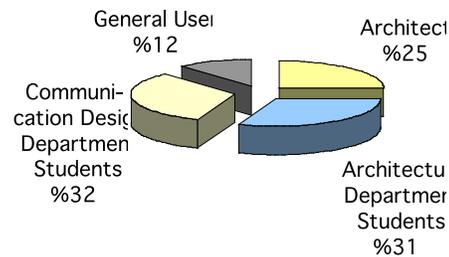


Figure 1. Percentage of users involved usability evaluation of architectural web sites

1. An Overview of Usability Test Environments

In usability evaluation there are 2 main environments for usability tests:

1. traditional laboratory environment(where usability tests are conducted)
2. Internet (where usability tests are held remotely)

These two usability test environments both have disadvantages and advantages in terms of users who will participate in usability evaluation. In the first situation, the user is in an artificial environment with many devices such as video captures, recorders, and other people observing and evaluating him/her interaction with the product. There are resolutions in order

to make the user feel as if he/she is in his/her natural environment (work, home), i.e. the observers and evaluators can be located in one-way mirrored room next to the test environment to be able to see the user.

In the second environment, because the user and the evaluator, observer are separated from each other by means of time and space usability evaluation can be conducted asynchronously. In this situation user is in his/her natural environment such as office or home. Naturally, she/he can feel more comfortable when participating the evaluation. As a result, the network itself and the remote work setting have become intrinsic parts of usage patterns, difficult to reproduce in a laboratory setting, and developers often have limited access to representative users for usability testing in the laboratory.

To gain the advantages of traditional usability lab environment, devices should be developed in order to record and understand the users' behaviours/reactions. The system to be developed should be able to capture and record user reactions during the evaluation. This system should be designed to record mouse clicks, to measure the time spent on interfaces.

However, the systems, which will simultaneously record the user reactions, answers of the questions asked to the users, should be developed for remote usability tests. This system should have extra abilities such as recording of mouse clicks, measuring of the time spent on interfaces to be able to get more effective results in a correct way. It is necessary for the tool, developed for the remote usability test to have an advanced technological structure for the achievement of the evaluation.

The usability test which is held via the Internet environment classified in 6 topics in general (Castillo, 1999; Castillo vd, 1997):

- What do the users think of when using the product?
- Is the basic functionality of the product valuable for the user?
- Are the performances and the navigations of the user intuitive or is direct manipulation allowed?
- What do the old users of the same product think of the new GUI (Graphical User Interface)?
- What kind of preliminaries are needed for the user when using the product?

For the case-study, at the first step, several softwares for evaluation and testing were examined. Although most have many advantages, because visual attraction is very important in architectural web sites, a tool which have advanced qualities such as being able to record the time spent on each visited pages, URLs of the pages visited, the mouse clicks on the user interface, in order to obtain the navigation route of the user. Determination of this method constitutes an important criteria for the interface design of the tool.

2. Special Tool Developed for Remote Usability Evaluation

As it is determined that the usability evaluation tool should be on-line, besides testing the pilot architectural web sites, also management of the tool and evaluation method should be available. Starting out from this point of view, the tool was developed to consist of 2 parts. The first part can be accessed by users where they visit and answer questions about the pilot

web sites. On the other hand, the second part is constructed for only the use of administrator where he/she can manage the content of the usability evaluation on-line such as

changing the questions,
recording the changes he/she made,
cancelling the questions,
forming a new question group,
deleting a question group,
changing the font colours used in questions,
arranging the way the answers and questions are to be seen (radio button, pop-up menu, text box, tick-box and etc.)

2.1. Sections of the On-line Usability Evaluation Tool Accessed by the Users

A **registration database** is opened automatically for **every user**, when users are connected to the **URL** of the **tool**. The user can **access with his/her name** by registering, if he/she wants. If the user doesn't want to register for the site, the tool takes the **computer's IP address**; it leaves down a cookie to the user's computer. If the user connects to this website again, the tool can recognize the computer. The following information is in the database opened for each user:

- **what were the user's answers to the questions?**
- **how long has the user stayed in which pages?**
- **from which page has the user passed to another one**

Additionally, the user can adjust some characteristics according to himself/herself, in other words, the interface can be customized. There are choices such as customizing the font colours or background colour of the tool's interface among this characteristics. The users can only reach the GUI for the pilot architectural web sites, the section for the questionnaires, news related to the site.

The interface, which appears, when it is reached to the URL of the tool, is shown in figure 1. The names and URL links of pilot test web sites and are provided within this interface.



Figure 2. Main page of the tool which is developed for the case-study

After the first interface shown above, the user reaches the registration part. The user is allowed to evaluate the pilot architectural web sites without registration, but it is preferred because demographic structures of users can be provided only by registration method.

When the user accesses to the registration interface, different forms under the different titles such as identity, password, contact, education, personal, preferences are appeared. The user fills out these forms respectively.

When the user accesses the first part of the registration named as “identity” which is one of sections mentioned above, the information mentioned below appears in the form. These are as follows:

- Title,
- First Name,
- Last Name,
- The user can write his/her e-mail address in the e-mail part, if the user wants to learn news related to this web site or the reaction test he/she participated,
- A user name determined by him/her accessing to the web site,
- A password determined by him/her accessing to the web site,
- A retype password part to confirm this password,
- Password hint question part,
- Password hint answer part should be filled.

The user passes to the education part, after he/she completes the contact part. The user should fill out the followings (Figure 3):

- name of the university and graduation year,
- name of the department in which the user studied at the university,
- if the user has a master or PhD degree or if the user is a master student or PhD candidate, there are blanks on master and PhD and related boxes of year

The image shows a screenshot of a web application interface for 'UTOI USABILITY TESTING OVER INTERNET'. The page has a dark blue background with white text. At the top left, the logo 'UTOI' is displayed in large white letters, with 'USABILITY TESTING OVER INTERNET' underneath. Below the logo, there is a navigation menu with links: 'Adminstrators', 'Register', 'My Account', 'Test Sites', 'Personalize', 'Questionnaire', 'Bulletin Board', 'News', 'Help', 'Contact', and 'Subscriber'. A breadcrumb trail reads 'Identity > Password > Contact > Education > Personal > Preferences > Logout'. The 'Education' section is active, showing four rows of input fields: 'High School' with a 'Year' dropdown, 'University' with a 'Year' dropdown, 'Department' with a text input field, and 'MASTER' with a 'Year' dropdown. Below these is a 'PHD' section with a text input field and a 'Year' dropdown. A 'Go' button is located at the bottom of the form.

Figure 3. The Interface in which users fill out their education information

The user fills the required data in the personal section, after he/she fills the education title. The user should fill the followings in the related boxes:

- gender,

- date of birth,
- nationality,
- work industry,
- work position

The user fills the required data in the preferences section, after he/she filled the personal part. The user should fill the followings in the related boxes:

- how can the user be informed about the results of the reaction test?
- how often does the user want to be informed about the news?
- how did the user hear about this web site address?

The user finally has been registered, when he/she has fills out the required data mentioned above. Afterwards, the logout title has been appeared on the screen, which gives the registration message.

The user can surf through the pilot architectural web sites now. Therefore, the user clicks “Test Sites” title which is on the left side of the interface.

The user accesses to the web page in which there are questions related to the pilot websites, after he/she has visited the pilot web sites. There are different types of question groups prepared for three different types of users who are architects, graphic designers, students of Architecture Department, students of Communication Design Department (Figure 4).



Figure 4 . The Interface where questions related to the target user groups is displayed

The user answers to the questions by choosing the appropriate questionnaire for himself/herself. The figure mentioned below should be shown as an example for the questionnaires (Figure 5).

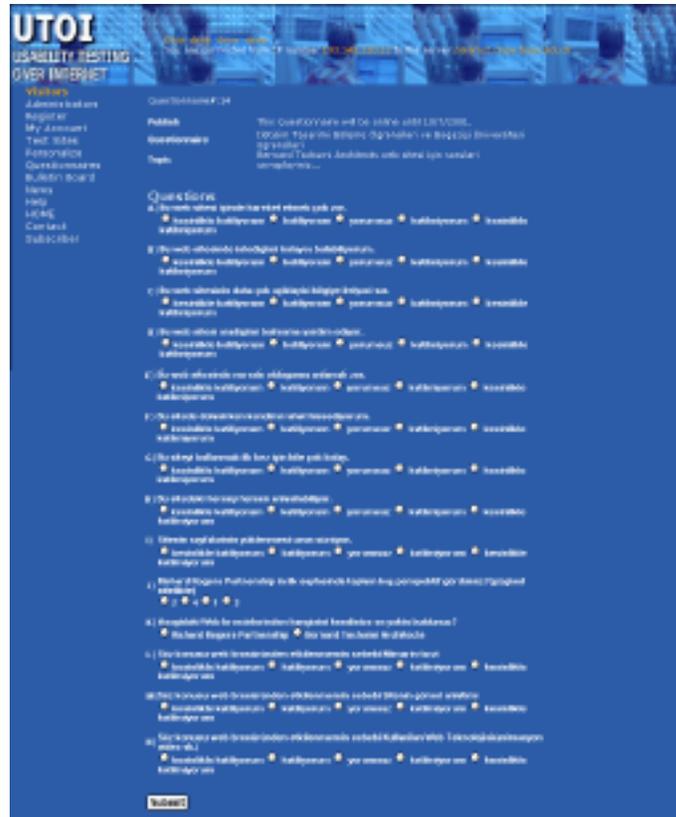


Figure 5. A Sample Interface for the questionnaires

2.2. The Section that can be accessed by the Administrator

In this part of the tool, different parts of the site can be reached in the same interface; the possibility such as downloading of prepared questions, questionnaire addition and removal, question changing, addition, removal are provided.

The use order of this tool for the admin of the usability evaluation is as follows:

When the admin connects to the web site, the first appeared interface the same as the visitors' user first interface. After logging in, the admin has the ability to make any changes about the content structure of the tool.

After the administrator accesses to any of the questionnaires, the following parts will be appeared. These are:

- Publishing date data of the questionnaire from...to...
- Questionnaire part on which the name of the questionnaire will be written,
- Topic part on which the topic of the questionnaire will be written,
- Numbering part on which the numbering style of the questionnaire's is selected

After entering these data, changing of question, new question addition or removal on the same page will be done again. If the evaluator wants to make changes in any question, the following parts will be appeared when she/he clicks on that question.

The evaluator/administrator will be able to get the usability test results in summary with graphical expressions. She/he will reach the following data via internet in this tool. These are:

- which pages are used at most?
- how many people have used these pages?
- with which IP numbers do they reach to this tool?
- which browsers are used while using the pilot architectural web sites?
- which operating system is used while connecting to the pilot architectural web sites?



Figure 6. The Interface about General Statistics

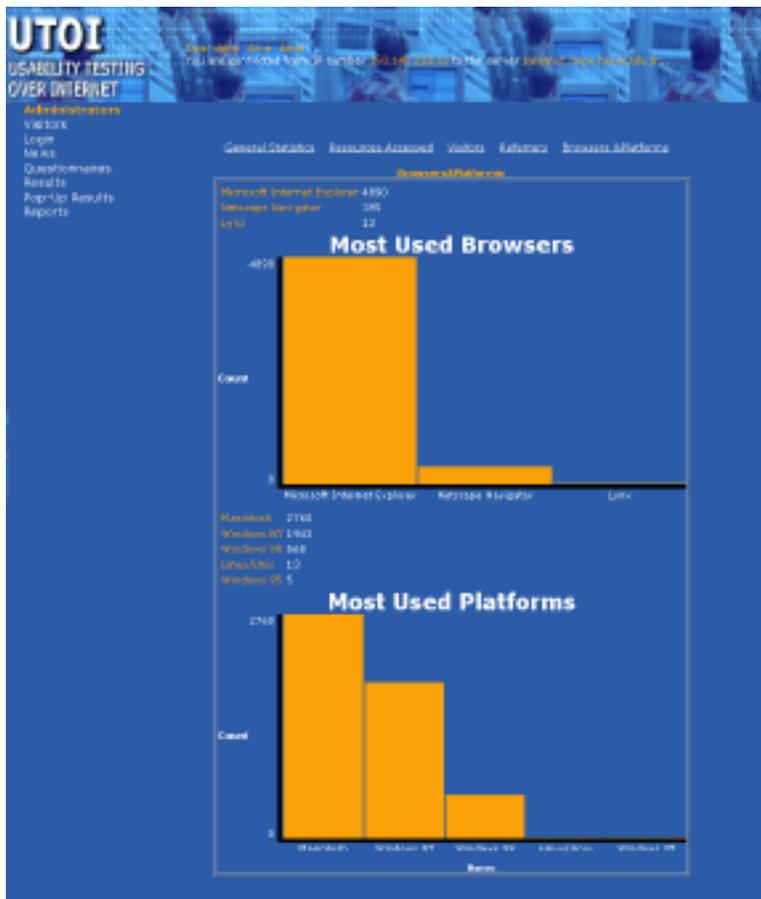


Figure 7. The Interface which shows the operating system and the browser when connected to this tool

2.3. Technical Specifications of the Tool

Usability Testing Over Internet Program serves as a web site that is programmed by using ASP (Active Server Pages) and Javascript programming languages. HTML and CSS (Cascading Style Sheet) languages / technologies are used in the design of the user interface and Microsoft Access is also used as a database (The program supports any type of database).

The software runs as a web site by the Internet Information Server (IIS4, IIS5) web server that works on Windows NT and Windows 2000 servers. The pilot web sites which are wanted to be tested by this tool, is copied to the local server for the users to visit these copied web sites.

The reports about the more detailed behaviours of the users in the pilot web sites and the data obtained to analyze these data more detailed can be downloaded from the web site with file formats of the statistical softwares such as MS Access, FileMaker or SPSS. The statistical software used here actively is MS Access .

The mentioned tool is prepared in the framework of the thesis in the subject of UTOI (Usability Testing Over Internet) by Mehmet Ali Orhan under the advisory of Assoc.Prof. Lele Akman, Bosphorus University, Computer Engineering Department.

Operating System: Windows NT 4.0 / Windows 2000 [IIS4 / IIS5]
Web Server: Microsoft Internet Information Server
Database Server: Microsoft SQL-Server, Access, ODBC (Open Database Connection)
Application: Java, HTML, JavaScript, VB Script, and ASP
Content Preparation: Microsoft Internet Explorer (IE) versiyon 5.0 veya
Netscape Navigator 4.5 or higher (for data transfer FTP and HTTP)
Programming Languages: C++, Visual Basic, Java

3. Questionnaires

Users were asked to answer 2 groups of questionnaires for each pilot architectural web sites. As mentioned above, users firstly fill out the required data about their demographic qualifications and then visit the pilot architectural web sites. After completing the visit, they turn back to the on-line tool and answer the questions about the sites. 13 questions were asked for each pilot web site which means a user should have answered 26 questions totally. The questionnaires had 3 main structures: questions about the interface design, questions about the interface design and its compatibility with the manner of the related architectural office, questions about the navigation structures of the sites, questions about how users were careful when visiting the web sites. The last group of questions were also prepared considering that people pay more attention to what attracts themselves.

4. Conclusion

The on-line tool and the whole usability evaluation method which was developed for our usability evaluation, had both advantages and disadvantages. During the usability evaluation, we received outputs from the users. Although we examined that the optimum number of questions might be 12 and as possible as short in order not to bore users and cause ignorance, users stated that the questions were long. Such kind of comments mostly came from users who are supposed to be web designers. On the other hand, people who constitute target user groups did not have such comments. The method was, as stated above, the user first goes through the pilot architectural web sites and then answers questions for each of the 2 sites. As a result, people who are non-target users, usually forgot a few qualifications about the web sites. So, they could not answer 2-3 of the questions.

The on-line tool and the whole usability evaluation method was very effective in terms of gathering and examination of the results. The administrator could access the database of the users and all their answers about the pilot architectural web sites wherever he/she wanted. The admin could open the databases both in MS Excel and Access format. It was rather easy to classify the answers and prepare macros for gathering specific results.

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Figure References

- Figure 2 <http://palamut.cmpe.boun.edu.tr/utoi/>
- Figure 3 <http://palamut.cmpe.boun.edu.tr/utoi/Users/education.asp>
- Figure 4 <http://palamut.cmpe.boun.edu.tr/utoi/Questionnaires/questionnaireslist.asp>
- Figure 5 <http://palamut.cmpe.boun.edu.tr/utoi/Questionnaires/questionnaire.asp?id=4>
- Figure 6 <http://palamut.cmpe.boun.edu.tr/utoi/Administration/Questionnaires/Generalresults.asp?id=4>
- Figure 7 <http://palamut.cmpe.boun.edu.tr/utoi/Reports/reports.asp?statistics=browsers>