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Usability evaluation of the digital archive of the Hellenic Broadcasting Corporation (ERT)

Emmanouel Garoufallou, Fotis Mystakopoulos, Rania Siatri, Panos Balatsoukas, and Georgia Zafeiriou

Department of Library Science and Information Systems, Alexander Technological Educational Institute of Thessaloniki, Greece

Abstract: The Digital Archive of the Hellenic Broadcasting Corporation (ERT) is one of the most important attempts to preserve and disseminate the most valuable audio-visual archive of the Hellenic history and culture as seen and recorded throughout the years by the National Broadcasting Corporation. A usability survey was undertaken in order to evaluate the aforementioned digital archive using Jeng's usability evaluation model. The model aims to evaluate Effectiveness, Efficiency Satisfaction and Learnability. The data collection instrument consisted of a questionnaire containing a series of scavenger hunt tasks, in conjunction with a series of evaluation questions. The study was carried out among undergraduate students of the Library Science and Information systems Department of the Technological Institute of Thessaloniki.

Keywords: Evaluation of Digital Library, Usability study, Usability evaluation models, digital archive, Hellenic Broadcasting Corporation, Evaluation models, Accessibility, Effectiveness, Efficiency, Satisfaction, Learnability.

Introduction

Digital libraries have come a long way and we witness their phenomenal growth. As research in the formative years of DLs was oriented towards technological advancements and digitisation of material, discussion on the issue of evaluation was ignored. As Saracevic (2000, p.351) so sharply points out at that time "…evaluation is more conspicuous by its absence (or just minimal presence) in the vast majority of published work… So far, (it) has not been even specified as to what it means and how to do it." However in the last few years an increased interest in evaluation of digital libraries and its techniques is noticeable. Many researchers have acknowledged the inherent difficulties laying

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in the evaluation of digital libraries (Dobreva et al., 2011, Borgman, 2000, Saracevic 2000, Saracevic, 2004) such as the richness of their content, complexity of their systems, diversity of users and limited funding. Most researchers in Digital Library evaluation research have been focused on two main areas: usability and impact studies (Chowdhury, Landoni & Gibb, 2006) with the former being more widely researchers than the later. For example, there are many studies concerning the usability evaluation of various types of digital library systems and technologies, such as repositories (Hammil 2003, Ferreira & Pitham 2005, Veiga & Silva 2006), websites (Pearrow 2000, Campell 2001, Oulanov & Pajarillo 2002) and information retrieval systems (Kelly, 2009).

According to the International Organisation for Standardization (1994) usability is defined as "...the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." Landauer as quoted be Jeng (2005, p.97), incorporates the notion of "ease of operation" in usability. Furtado et al. (2003) also consider usability and "ease of use" to be closely related notions and ideas but he also suggests that learnability of a system should be accounted for. Chowdhury and Chowdhury (2003) on the other hand view usability as a more relative concept that it judgment can be shaped according to the aim and objectives of each digital library.

Researchers attempted to identify the core elements in an attempt to "breakdown" the notion of usability, thus rendering the process of evaluation more manageable and "measurable" for researchers. A few examples follow in order to illustrate the point. The MIT Information Services comprised a list of 10 elements that should be taken under consideration. These are: navigation, functionality, user control, language and content, online help &and user guides, user and system feedback, consistency, error prevention and correction, artificial and visual clarity. Nielsen (1993) identified 5 elements in order to evaluate usability: learnability, efficiency, memorability, easy error recovery and satisfaction. Oulanov & Pajarillo (2002) have also included helpfulness and adaptability. Jeng (2005) proposed a holistic model for the evaluation of the usability of Digital Libraries. The proposed model incorporated the elements of Effectiveness, Efficiency, Satisfaction and Learnability. Moreover, the Satisfaction element in Jeng's model was further decomposed into six elements. These were: Ease of use; Organisation of Information; Labeling; Visual Appearance; Content; and Error Correction.

Unfortunately researchers continue to examine a plethora of elements and attributes in an attempt to evaluate usability although it has to be acknowledged that efforts are being made towards a common evaluation framework.

Methodology

The research was designed, based on Jeng's model of usability evaluation, which served as the theoretical basis as well as a compass for the development of the research tools. The four axis around which the evaluation tool was developed aimed to evaluate *Effectiveness, Efficiency Satisfaction* and *Learnability.* A questionnaire containing a series of scavenger hunt tasks was employed, and in conjunction with a series of evaluation questions, served as a data collection tool. The questionnaire consisted of 3 parts. The first part aimed to collect demographics. The second included 11 tasks, varying from locating specific pieces documentaries, to locating advanced help options and general information regarding the digitization project. The selected tasks reflected typical functions of the system under evaluation. Finally, the third section prompted users to evaluate different aspects of the digital archive and provide comments of their overall impression. In particular, questions in the the third part of the satisfaction questionnaire were organised into five satisfaction components following Jeng's (2005) model of digital library evaluation. These were: Easy of use, Organisation of Information , Labeling (or Terminology), Visual Appearance (or Attractiveness) and Error correction. The sixth element, i.e. the Content, was not part of the present questionnaire.

The questionnaire was administered to undergraduate students of the Department of Library Science and Information Systems of the Alexander Technological Educational Institution (ATEI) of Thessaloniki. More specifically the questionnaire was completed by 64 students attending a module on Digital libraries and Metadata. The research was conducted during June 2011, in the classroom in which the module takes place each week. Users were able to use any browser and search engine they liked. Participants had about 70 minutes to complete the full questionnaire. Each task was allocated a specific amount of time for its completion. The allocated time varied according to the level of difficulty (3 min, 5 min, 7 min), which was determined by the researchers. For example location of general information within the site was allocated a 3-minute time slot as it was considered an easy task, while tasks that asked users to find and locate a specific piece of audio-visual material were allocated 7 minutes.

Results

Demographics & Computer use

Out of the 64 participants 7 were men and 57 women. It has to be acknowledged at this point that the Department of Library Science and Information Systems is dominated largely by female students and the great variance in the sample, it does indeed depicts the great difference in the population. The module on Digital libraries and metadata is taught in the 6th semester so the great majority of the participants were students on the 6th semester or above where as only 3.1% were students attending the unit from lower semesters.

14% of the participants indicated that they were familiar and had already used the digital archive in question, before. Due to the small percentage of

participants, who were familiar with the archive, the creation of two distinctive groups of beginners and advanced users of the archive, was considered to be ineffective.

Students were asked to estimate the average time spend on computers on a daily basis. Cumulatively 75% of the respondents indicated that they spend more than 3 hours. Table 1 provides a detailed brake up of the responds on a daily basis.

Table 1: Daily use of computers

Hours	Percentage
1-2	20.3%
3-5	42.2%
6-8	28.1%
Over 8 hours	4.7%

Finally students were asked to indicate whether or not they had prior knowledge of the archive. 14.1% indicated that they had used the archive before where as for the 85.9% of the participants was the first time of use.

Evaluation of tasks

Tasks were designed in such a way in order to enable researchers to evaluate effectiveness efficiency, satisfaction as well as learnability. Satisfaction was evaluated as a whole through the completion of the predetermined tasks as well as through the ease of use, organisation of information, attractiveness of the archive, ease of recovery from mistakes. In order to measure overall user satisfaction regarding the usability of the digital archive, the Likert scale was used. With the completion of each task each participant was prompted to evaluate the ease of each task from 1 to 5, with 1 indicating most easy in use and 5 most difficult in use. Table 2 provides a detailed brake down of the evaluation mean value of each task. The overall mean value of satisfaction, reached 2.8, which is interpreted as satisfactory.

Table 2: Tasks & Satisfaction

Type of task	**Degree of satisfaction**
1. Locate current news report	2.53
2. Locate old news report	2.14
3. Locate specific link	2.85
4. Retrieve specific piece of information	3.33
5. Find specific help information	2.55
6. Locate a documentary	3.08
7. Locate specific navigational link	2.8
8 & 8.1 Locate a specific video & watch a given timeframe	3.08 & 3.27
9. Locate a music file	2.87
10. Locate information and printed	2.64
11. Collection of photos and provide information	2.5
Overall mean value of satisfaction	2.8

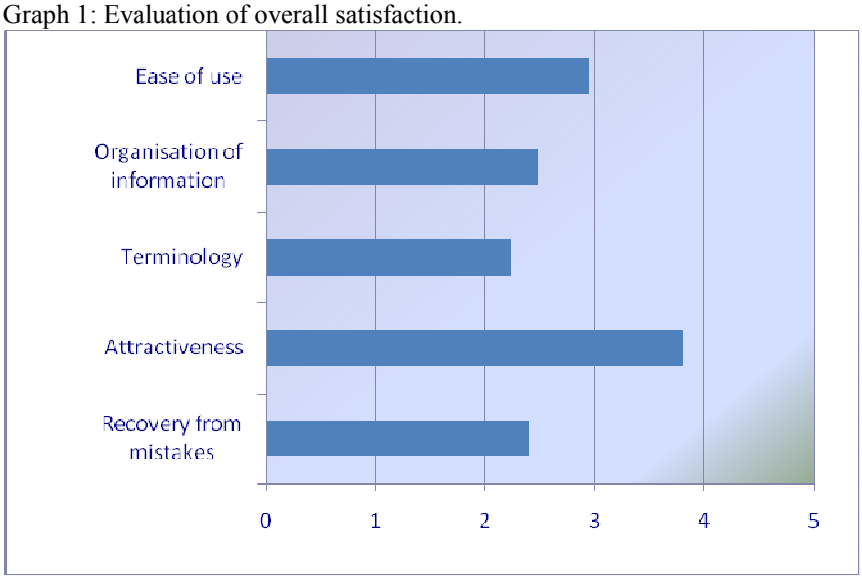
Users did not express a strong opinion on the issue of usability satisfaction. However they did indicate their inclination or disinclination towards specific features of the archive. Arrangement of types of material as well as chronological order of it, the aesthetically pleasing environment, and the ease and efficiency of searching in specific aspects, were among the best appreciated features of the digital archive. To illustrate the point, users indicated that "the choice of material categories was well placed in the webpage", "bright colours and ease of search" "pleasing environment and ease of use" "it contains material that nowhere else can be found" "the richness of the material is a very strong feature". With regards to the negative aspects of the archive users identified the lack of help guidance with the search capabilities of the site. They noted that the search engine of site with such amount of information is the most important tool for the efficient use of the site. Although generally they were satisfied with certain aspect of the search tools, the lack of Help information / guidance with the capabilities and search options was considered a great omission. They noted that an experienced user could find its way around, however for an inexperienced user of technology, or, search engines can be rather confusing. More specifically they indicated that "if someone does not have knowledge of search tactics he could be lost" "no guidance is offered for searching the archive" "no help for searching one could be lost in this amount of information".

Overall satisfaction

In the 3rd part of the questionnaire, users were asked to evaluate a series of elements through their experience. The elements that they would have to focus in were: Ease of use, Terminology, Organization of information, Attractiveness and Error recovery. The questions combined Likert scale 1 to 5 as an indication

of satisfaction, which was followed by open ended questions where they could note any type of comment or extra information they would like to provide. The following graph provides analytical information on each element.

Graph 1: Evaluation of overall satisfaction.



The remainder of this section presents the results of participants' responses across the theoretical constructs of the third part of the satisfaction questionnaire. These were: Ease of use; Organisation of Information; Terminology / Labeling; Attractiveness / Visual Appearance and finally, Error Recovery.

Ease of use

Ease of use of the digital archive achieved a mean value of 2.95 on the Likert scale (1=easy to 5=difficult). This value also reaches the overall mean value of satisfaction which was indicated as 2.80 as users have completed all 11 predetermined tasks that had to accomplish. With regards to the comments provided by users they indicated that "there were many things that I could not locate them", "although categories were easily identifiable and accessible many times I could not locate that which I seek" "It looked very easy". Others indicated that in some instances the system "was inadequate" "with regards to the documentaries I found it rather difficult to locate the appropriate information"

Organisation of information

The mean value regarding the organisation of information reached 2.48 on the Likert scale, with 1 being clear and 5 represent vague. Participants indicated that the organisation of information was adequately clear although a significant number of users disagreed. In terms of positive notes students indicated that "information has been categorized in very clear manner", "I find the organisation sufficiently comprehensible" structure is "logical clear plain user-friendly and pleasing». On the other hand many users felt that the information "was not well organised" some felt that "the organisation was really bad [resulting in creating] navigational difficulties. Others indicated that although in general organisation was rather clear when it came to documentaries the layout and organisation was rather. With regards to the issue of documentaries there is indeed an issue with the labeling as well as with the organisation. Although a category exists labeled as Documentary however it is misleading as it contains only one documentary, concerning the undertaking and the stages of the actual digitization project. In the advanced search where a type of film can be specified there is no choice for Documentary either. As a result locating documentaries when unsure of the title can be a rather confusing task as for browsing the documentaries this is impossible.

Terminology / Labeling

In terms of terminology the mean value on the Likert scale was 2.24 (1=clear 5=vague) which, is just below average. The opinions expressed by students were in most cases on the positive side, indicating that they believed "categories were clearly labeled", "terminology was simple with no confusing terms". Some said although categories were not very clear however "with a bit of searching you can find what you are looking for". For once more documentaries proved to be the Achille's heel of the archive, as users indicated that "categories were clear but I could not locate a category labeled documentaries".

Attractiveness / Visual Appearance

Design and attractiveness of the site was the feature that gained the highest mean value of 3.81 at Likert scale (1=not at all 5= a lot). The appearance of the site seems to be its strongest point as the stimulating working environment and the combination of colours creates a pleasant overall feeling when using the archive. Users commented on the "beautiful and vibrant colours, user friendly interface", "I particularly appreciated the vibrant colours which create a positive feeling", "use of particular colours make it attractive to use"

Error recovery

In many cases throughout the completion of the tasks users may "have taken a wrong turn" on their searching process either due to unclear labeling or due to confusing organisation of information. Users when asked whether or not recovery from error was easy their answers provided a mean value of 2.41 on the Likert scale with 1 being easy and 5 being difficult to recover from errors.

The evaluation was followed up by neutral comments in most cases such as “so and so”, “I go straight to the home page”, “It is rather easy as you can go to the home page”, and in some cases a simple no or yes served as a comment.

Conclusion

The archive of the Hellenic Broadcasting Corporation is one of the most recent and impressive efforts in the Greek domain of digital archives and libraries. It was selected as it provides access to a most valuable source of historical and cultural heritage of Greece. The research aimed to provide evidence of a first evaluation effort, regarding the level of its usability. The research utilised Jeng’s model of usability evaluation as it was described in methodology section. The participants were undergraduate students attending the unit “Digital Libraries & Metadata” at the Dept. of Library and Information systems at T.E.I. of Thessaloniki. The Hellenic Broadcasting Corporation has been evaluated as an attractive digital space that, however, in many instances have proved to be ineffective or frustrating in terms of searching capabilities and mechanism.

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