Usability of the Submission Process in a Journal System

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Abstract. Electronic open access journals are adopted by many Brazilian institutions, with over 1600 journals developed with the Open Journal System (OJS) at various universities. In this scenario, the submission process of article's documents in this system becomes focal point for usability analysis, because it is the step that constitutes the initial stage of interaction of various users profiles. Thus, this study aims to measure the level of satisfaction of the authors who submit manuscripts to OJS, with the aim of contributing to studies of this system. Therefore, a survey is presented using the System Usability Scale questionnaire. Satisfaction criteria are evaluated with the submission process by authors of a university journal portal. Results show that OJS appears intuitive, however some difficulties can be identifying in the process, even if the overall evaluation of the system is good. The study contributes to the discussion on the usability of OJS, aimed at improving this system that is widely used in Brazil.

Keywords: System usability survey · Open Journal Systems

1 Usability Analysis of Scientific Publication Systems

Scientific journals with access on the internet require online tools that guarantee performance and satisfaction to its users, especially in tasks associated with publishing scientific papers, as author submission, peer review and publication of digital documents. Some intermediate tasks, restricted to users with defined roles, sometimes present difficulties in implementation.

The submission tasks consist of filling out forms with metadata about the submitted document, sending the file of the paper and any other files with data underlying the conclusions or that were obtained during the research that will be published. However, the author submission task, in some magazines, include steps related to the journal's policies, issues that ensure ethical points and other items that can be misleading.

Large part of current software for automating the publishing process perform in a similar way, especially in the peer review procedures, but can be differentiated into more specific aspects. Given the variety of systems for the publication of scientific journals, this study is restricted to the analysis of the submission process in the Open Journal Systems (OJS) software, due to its wide use in open access journals, as pointed by [1], who considers it as the main software for the implementation of open access journals.

The continuous analysis of processes automated by computerized tools supports software's improvement, even being widely used, this system still can provide better interaction between the author and the article submission task. Usability analysis contributes to developments more contextualized with user's needs.

2   Methods

The study has quantitative and qualitative aspects, and is applied to verify the usability of OJS document submission process. We used the survey technique with a System Usability Scale (SUS) questionnaire, contextualized to the paper submission task. The questionnaire was developed in Google-docs and sent to 350 authors of the University of Brasilia (UNB) journals portal.

The Software Usability Measurement Inventory (SUMI) questionnaire [2] evaluates five aspects of user satisfaction in relation to a system:

- Efficiency: indicates whether the software enables the task to be done quickly, effectively and economically;
- Affection: is the psychological dimension that arises during the interaction, indicating whether the user feel mentally stimulated to use the system.
- Utility: refers to the perception of the user and the system utility;
- Control: indicates how much the user is who controls the system operation flow, not being controlled by the system but controlling the system;
- Learning: the ease with which one can learn to use the system features.

This questionnaire is applied in the analysis of an educational website [3], however, due to the amount of questions (50), we chose to use the SUS with only 10 questions in a likert scale [4]. The SUS survey was developed as part of a usability engineering program of Digital Equipment Co. Ltd, UK. It is recommended that the questionnaire to be applied right after the user interaction with the system, but in this case the questionnaire was sent at a period later of the interaction. At the end of questionnaire a text field was added to allow considerations, bringing wider samples of user's opinions.

3   Results

The SUS questionnaire was answered by 179 OJS authors, returning a score 68, in a 0 to 100 numerical scale. This score, in an adjectival scale, can be analyzed as between OK and good, where values below 25 are 'worst imaginable' and above 85 is excellent [5]. Thus, presents evidence of a good adaption of the OJS submission process and intuitiveness of the steps for users.

The distribution shown in Fig. 1 histogram highlights two user groups, one presenting good interaction (65 to 71.5) and one with less ease of operation (45.5 to 52). However, confirming the general indicator, most authors consider the software easy to use, inasmuch as there is a certain concentration above 65.

Analyzing the responses by applying the Expectation Maximization clustering algorithm over the scores obtained, one can identify two main groups of users: a group
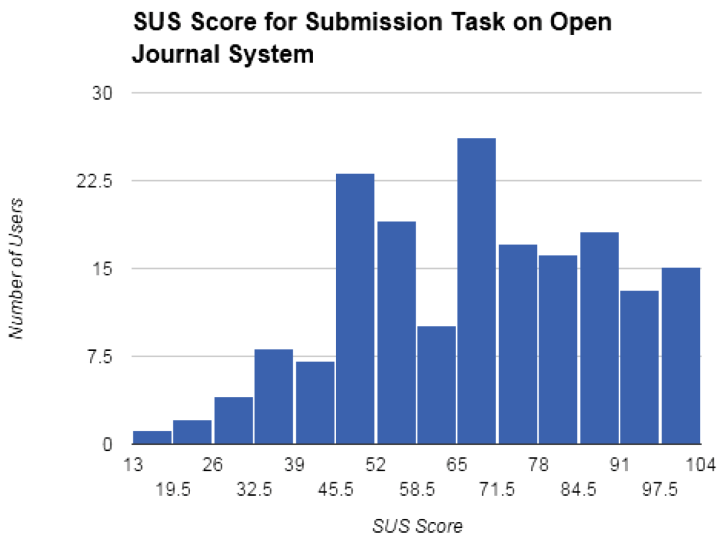
Fig. 1. SUS score histogram

of 142 users, with an average score of 94 and standard deviation of 5, and the other with 37 users with an average of 62 and a standard deviation of 17. This do not indicate consensus among users, but do not have significant evidence to suggest low ratings, only medium and high satisfaction.

Grouping users through k-means algorithm, in turn, led to two groups: a group of 100 users with median score in 53 (good) and another group of 79 users with median score of 87 (best imaginable). it was confirmed the scenario in which most users consider very intuitive OJS of the submission process, but with the possibility of improvement.

The analysis, under more qualitative approach, by the comments obtained presents other perceptions of OJS. This analysis allows to note aspects that quantitative data do not reveal. Initially it was noted that the computing environment in which OJS is made available influences on the system's satisfaction. The same way, some users suggests improvement in the submission process with respect to the interaction between the author and editor, by means of automatic mails.

4   Final Remarks

Journal systems can be analyzed for ergonomic criteria, from which are listed elements that can be improved in new versions of the system [6]. The score hit by OJS and the lack of consensus among users demonstrates that there are elements to be improved in the system through the application of ergonomic criteria to better driving user in the submission task.

For future studies, we suggest analyzing OJS usability according to disciplines categorization of users. It is supposed that more technical disciplines scholars have

closer relationship with the technology, while students of humanities use less technology in their research, thus presenting less familiarity.

The current challenge for the OJS is to meet the diversity of users of this system, with users from all disciplines, with more or less affinity with technology. The same way you need to break with the behavioral traces related to the printed publication, adjusting the submission process with possibilities that current technology can offer.

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