Usability Evaluation of a Multimedia Archive: B@bele

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Abstract. In institutional repositories, simple discovery and submission interfaces help increase documents deposit as scholars have very little time to self-archive. So far, however, usability evaluation of such interfaces has been limited. In this paper, we present the usability evaluation of a repository interface, i.e., the interface of B@bele, the DSpace installation of the Multimedia Production Centre (CPM) of the University Milano-Bicocca. The results of this evaluation point out the most important shortcomings of the present DSpace interface: difficulties with browsing within communities and collections; problems with the submission interface due to scarcely familiar terminology (metadata) or terms that are not relevant in the specific academic context (community); problems in the submission process due to some ambiguous buttons, to the lack of authority files, and to the lack of clearly marked compulsory fields. In this way, this study will help improve not only B@bele, but also all other installations of DSpace currently available.

Keywords: User interfaces, institutional repositories, DSpace, usability evaluation.

1 Introduction

Institutional repositories (IRs) are one of the most innovative and creative components of digital libraries nowadays. Their function is to "manage, preserve and promote access to the knowledge base produced within an institution" [5].

Institutional repositories are a powerful and complex mean to disseminate academic knowledge. Their complexity is reflected in the wide spectrum of aspects that institutional repositories cover: technological developments, management issues, the need to analyze their adoption and use by the different scientific communities, case studies and best practices in the use of repositories, studies on the state of the art in local contexts, the marketing of repositories [1], [2], [4], [5], [10], [11], [13], [16], [17]. There is however still an aspect in the literature on institutional repositories that

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has remained rather unexplored: it is the usability of their applications which may prevent an increased use of institutional repositories.

With the release of DSpace 1.5, based on the new Manakin interface, the need to evaluate DSpace usability has become more urgent. In this paper, we present the usability evaluation both of the discovery and of the submission interfaces of B@bele, the DSpace-based repository of the Multimedia Production Centre (CPM) of the University Milano-Bicocca.

2 Literature Review

The literature on usability in repositories [3], [6], [8], [9], [12], [14], [15] comprises a couple of comparative studies on the usability of EPrints and DSpace [8], [12] and a few studies on the usability of DSpace alone [3], [6], [15]. Kim Jihyun [12], for instance, reports the results of a usability evaluation on the interface of both the EPrints and DSpace applications in use at the Australian National University (ANU). His tests were performed by18 students, equally divided between EPrints and DSpace. The tasks they had to perform mainly covered simple and advanced search activities. The submission interface was not evaluated in this study.

A study by Cunningham et al. [8] involved librarians and university researchers testing both the search and the submission interfaces.

Micheal Boock's [6] evaluated the submission interface of the DSpace repository for electronic theses/dissertations with 6 users from the Oregon State University (OSU). He reported some difficulties from the users to register in the repository and emphasizes the importance to follow documents submission with clear messages and an adequate feedback from the system itself.

Finally, Ottaviani [15] carried on a much deeper analysis of Deep Blue, the DSpace application at the University of Michigan. Its submission interface was tested by a group of lecturers, while graduate and undergraduate students evaluated the usability of the search interface. His conclusions on the search interface are rather different from those reported by Jihyun [12]: Ottaviani's experiments point out some problems relative to the advanced search interface, to the reporting in DSpace as well as problems in the submission interface, for what concerns the terminology adopted, the license agreement and the absence of any feedback from the system.

Another aspect that has been evaluated with DSpace was its information retrieval capabilities [3], both in its simple and advanced search functionality and the reporting to the end users. Both functionalities are experienced as inadequate for an electronic archive of Master's and Ph.D. dissertations.

3 A Case Study: B@bele

With the release of DSpace 1.5, based on the new Manakin interface, the need to evaluate its usability has become urgent. B@bele is an application of DSpace 1.5 in use at the Multimedia Production Centre (CPM) of the University of Milano-Bicocca. B@bele is not an institutional repository in the strict sense of the term, but it is

employed within CPM as a digital archive for mainly multimedia material by individual researchers and administrative personnel. At present, it hosts six communities, each with a personalized layout.

A number of modifications had to be introduced on the original Manakin interface. These include the full translation of the terminology into Italian along with the name of the repository itself which refers to the multimedia character of B@bele collections. The translation tried to adhere to the original English terminology as much as possible. Significant differences between the Italian and the English versions will be signaled throughout this paper when they apply.

It has been reported [7], [9] that the success or failure of digital repositories is proportional to the simplicity, the easiness and the velocity of the operations that are necessary to submit documents into the archive. Since these systems rely on self-archiving, the documents submission process and their connected metadata become a critical element in determining the usability of such platforms. To evaluate them, we analyzed:

1. The functionality of the search interface both in its simple and advanced version and navigation within each community and collection.
2. The functionality of the submission interface, i.e., the process of inserting items and documents with reference to the main options during workflow.
3. Metadata management, both in their submission phase and in their modification phase.

For all the examined activities, we intended to evaluate users' familiarity with the terminology adopted (for instance, metadata, Open Access), the degree of difficulty in the execution of the predefined tasks and the level of users' satisfaction while interacting with B@bele. In order to test B@bele on different user categories, we selected 15 end users, subdivided into three homogeneous typologies. They were: administrative personnel, faculty and Ph.D. students. They were all not familiar with the use of B@bele.

The methodology we followed was a participant observation combined with a thinking aloud protocol, consisting in a series of predefined tasks that each user had to perform separately and sequentially. The complete test has been recorded using CAMTASIA. A pre-test questionnaire and a post-test one were also submitted to the selected users.

4 Discussion of the Results

In this section, we highlight the most important results drawn from this study. We group our findings into four categories and indicate for each of them the problems that were experienced by the test users. Some problems are very much B@bele-centered (for instance terminology), the others actually pertain the DSpace 1.5 version and can therefore be generalized to all other instances of it. In the last section, we will present the guidelines to improve the usability of DSpace 1.5.

Terminology. Problems with the terminology were related to the inadequate adherence of the DSpace phrasing into Italian, which was causing some inconsistencies due to bad translations. The button "save and exit" at the bottom of the submission page, for instance, has been translated as "salva e annulla", literally from the previous Manakin interface version, causing a lot of confusion in many users who did not know what to choose between the button "next", to continue with the submission, and the button "save and exit", that would have caused their submission to be ended. The use of the term "save" did indeed induce many users to think that the saved item was published as well and submission was over. What was also missing was a clear and unambiguous nomenclature for each navigation button that could reflect its real function (for instance, a "continue submission" button instead of "continue" alone) and an exhaustive explanation of the more complex processes, like the workflow process, for example (see further).

Browsing in communities and collections. Our subjects had difficulties in distinguishing the concepts of "community" and "collection", in identifying the dependencies between them (i.e., from community to sub-community and collection) and in understanding the exact meaning ascribed to these two terms in this context since they are normally associated with social network research. An additional problem was the difficulty most test subjects showed in finding the link to the communities and the collections on the Home page.

Finally, once a community is selected, it is not intuitive for users to understand how many documents are included in a community and which, among those, are really downloadable in full-text.[1]

Upload. The problem with submitting a new document depends on the layout of the upload page. Finding the upload link on that page is not simple since it is not visually recognizable as the link is inserted in the middle of the page. This task becomes especially difficult if other processes are not yet concluded and are therefore still active.

Workflow. Our test pointed out the need to systematically revise the workflow process which is now fragmented, redundant and not very intuitive.

5 Guidelines to Improve the Usability of DSpace 1.5

On the basis of the empirical analysis discussed in the previous section, the following guidelines to improve the usability of DSpace 1.5 can be drawn. Although some refer directly to the specificity of B@ele (see points 1 and 2), the majority of the following guidelines are meant to improve the usability of the DSpace 1.5 interface itself.

1. Adapt the DSpace/B@bele terminology to the context of use, so that users with familiarity within a specific domain can recognize the terms adopted and assign a meaning to them.

[1] Some documents as a matter of fact may be embargoed and therefore are not downloadable.

2. Although the need for a help function is normally considered a sign of bad design, some form of help and user's support (that is missing in the present version of B@bele) should be included, for instance in the form of a glossary accessible with a hyperlink to clarify the meaning of specific DSpace terms.

Terminology

3. Replace the phrase "save and exit" with a more appropriate and intuitive phrase, for instance, "save and continue later", since the former induced many users to think that saving would automatically determine the document publication and terminate the task.
4. Rename the ADD button that is currently used to add multiple elements, for instance authors' names, as "add co-authors" or make its function more explicit in the text. The ADD button was indeed found mainly ambiguous: many subjects thought it had to be used to confirm the submission of the inserted information, with the results that they continued to add the same information.
5. Specify the meaning of technical or librarian-like jargon terms like "series" or "reports".

Navigation

6. Include back and forth buttons to make navigation more user-friendly.
7. Make the community page more comprehensible by:
    a. Compressing the list of communities into a drop down menu, so as to visualize each sub-level only when the higher level is selected. This would reduce the list length and give a clearer hierarchical structure although at the loss of some visibility and of the general overview.
    b. Indicating for each collection the number of documents there included, and their status, as public or not, using, for instance, a lock icon. In this way, users could get an immediate and intuitive idea over the archive consistency and over the accessibility of its content.
8. Distinguish visually between active and disabled breadcrumbs.
9. Include an author authority system to speed up the process of inserting personal data and to prevent typing mistakes.

Submission

10. Mark clearly all compulsory fields in order to speed up data submission and to allow users to insert only the really necessary metadata.
11. Make the link to a new submission more visible, in a position where it can be easily found by the users.

Workflow

12. Insert a separate section for the tasks the reviewer should perform, since this function is at the moment by far intuitive and clear.
13. Restructure the insertion page in order to reflect a more logical sequence from the point of view of a user executing a task.

6 Conclusion

In this paper, we have presented the usability evaluation of B@bele, an archive for the publication of multimedia material. This evaluation was not only intended to improve B@bele, but was also intended to provide the missing link in the usability evaluation of discovery and of submission interfaces, whose analysis has so far has been rather limited.

Our next step is to improve its usability in the way indicated in this paper. This will surely help the diffusion of digital archives in general and of open archives like DSpace in particular.

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