User Experience of Social Bookmarking Tools

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Abstract. Information and knowledge society brings a new context where technology enhanced tools are key elements for being able to find, evaluate, use and communicate information effectively and efficiently [1]. Bookmarking tools could be the essential tools for supporting information behaviour, specifically information managing and communication. This paper analyses the user experience of existing bookmarking and social bookmarking tools in an e-learning environment. The educational setting provides the required environment to truly study these tools, since their success is not only in the ease of storing, tagging and sharing resources at a given moment in time but in how these resources will be retrieved when needed in the future. In this paper we present a functional analysis and the usability inspection of the tools that support the management and usage of information resources both during short and long terms.

Keywords: Information society, information skills, information management, bookmarking tools, usability evaluation, e-learning.

1 Introduction

In a networked society, most people have the need to search, find and store information over the Internet. Users browse the web in search of content and services of their interest. Search engines like Google or directories like Yahoo! help them find what they are looking for. Using these services people locate interesting resources and access them, but when surfing the web, people also have to deal with things such as URL names, addresses, links and other things more related with the organization and infrastructure of the web than with their needs as users. All these issues are not easy to remember and, sometimes, make the browsing experience stressing.

Social networks and tools like Facebook or Twitter provide people with a way to interact with each other and share comments, images and experiences. In addition to that, these tools are an easy way to share links to web pages, articles, videos or other types of resources and, at the end of the day, each user has a great amount of references of resources to look, watch, read or listen. It is not an easy thing for the users to deal with all these resources, remember the ones they find interesting or store the URL they want to read or access later.

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Some years ago, bookmarking tools promised a solution to deal with this situation and presented themselves as key tools for users to achieve their information needs. The success and experience provided by these tools should be evaluated taking into account the long term period, that is, not only the ease of use of bookmarking resources but how these can be retrieved when needed again.

In the education area, information needs are even more important. Internet resources are part of the contents that students and teachers use to learn and teach. There are subjects – such as those related to or affected by information technology - that require a continuous update of their learning contents. As a result, the use of a closed format for these learning materials is not optimal in these type of courses, since in a very short period of time the material would be outdated. The information and knowledge society has introduced technology enhanced learning tools that students have to learn and, therefore, require to develop information competencies in order to do so. On the other hand, teachers also face new challenges and they must change the role from knowledge dispenser to knowledge facilitator. This change in the educational model is also changing the channels for transmitting knowledge, mainly textbooks. All these aspects promote a direct use of resources available in the real world, especially on the Internet. This is intended to encourage students to select the networked resources directly, use them, reuse them and share them with the rest of the educational and learning community. Given this new educational model in which the exchange of content is encouraged, some challenges and shortcomings must be solved.

In this educational context, not only technology enhanced learning tools are used but also existing Internet tools that can be used for teaching and learning. Good examples of this are the bookmarking and social bookmarking tools, like Delicious, Evernote or Diigo. These kind of tools are very good to tag and store links and even to share the links and build common folksonomies based on used tags. Nevertheless, most of the times, the experience to retrieve stored resources is not as good. From an information competencies point of view, the discovery, evaluation, storage and retrieval of resources are the key elements. Users (students) are becoming good in discovering and evaluating Internet resources. Tools are good and provide a good experience to store and use such resources but they should provide better ways to retrieve and use the resources later on.

The use of bookmarking tools and the features they offer is an essential element in the paradigm shift in education. They offer a set of advantages and drawbacks not only intrinsically because of their design and usability but also in relation to people information skills. Following sections present a deeper insight on these aspects. Section 2 presents the necessary information skills in the information society and their relation with bookmarking tools, Section 3 presents the study and evaluation of bookmarking tools. Section 4 shows the current situation regarding information needs and uses, and finally, Section 5 presents the conclusions of this work.

2 Information Needs and Bookmarking Tools

Information society is a networked society where the development mode is having a rapid process of change. It is different because the generation, process, and transmission of information have become sources of productivity and power of this society [2].

In order to educate qualified people for the information society, it is essential to rethink teaching and learning, make it student-centered, thus building upon the

acquisition and development of skills rather than content acquisition [3]. Information literacy is seen as essential for evolving the dominant paradigm of preprocessed information to a new learning paradigm in which students take over the capabilities to self-manage their learning throughout life. In addition, textbooks, lectures, exercises and other resources should aim to rely the learning process on resources available in real life and real work situations [4].

Therefore individuals with information skills should be able to [5]: classify, store and manipulate the generated or retrieved information retrieved and, recognize information literacy as a prerequisite for learning throughout life. More concretely, students with information skills should be able to 1) determine the nature of their information needs, 2) access to information needs effectively and efficiently, 3) evaluate information and its sources critically, 4) incorporate selected information into their knowledge base, 5) use information effectively to achieve the aim, 6) understand the economic framework, legal and social information usage, access and use of legal and ethical manner.

It is important for people to have tools to deal with information needs and how to find information, but, what is more, tools for managing information and evaluation. Bookmarking tools are specific tools for reference and link management. These tools can be part of the solution for managing and evaluation. Bookmarking and social bookmarking tools are appropriate applications to reference and share the knowledge available on the net. These tools are mainly characterized by: 1) save and retrieve links to online resources, 2) tag and comment on resources, 3) rating of resources, 4) online storage. Normally there is an associated storage service and all information is stored in the cloud and, thus, a user can access the same information, at any time, from different computers or devices and further information is safe from possible malfunction of the computer.

In addition to that, bookmarking tools can provide a layer for social interaction, thus encouraging exchange of resources and knowledge and the interaction and with others. The social layer is very useful in different aspects: sharing of resources with people who have similar needs and interests, knowledge about the "popularity" of a resource and construction of folksonomies.

Currently there are many bookmarking tools, most of them online through a web interface and free of charge. Some of the most interesting tools are:

Table 1. Main bookmarking and social bookmarking tools

Tool	URL
Delicious	www.delicious.com
Blogmarks	www.blogmarks.net
Blinklist	www.blinklist.com
Mister Wong	www.mister-wong.com
Evernote	www.evernote.com
Furl	www.furl.net
Diigo	www.diigo.com
Google Bookmarks	www.google.com/bookmarks/
Xmarks	www.xmarks.com
Historious	www.historio.us
Evri	www.evri.com

It is also interesting to note that there are tools that were originally created as bibliographic references managers and now also provide link and URL management. Some of these tools are: CiteULike (www.citeulike.org), Connotea (www.connotea.org), BibSonomy (www.bibsonomy.org) or Zotero (www.zotero.org).

3 Tool Evaluation

The current situation in which more educational content is in a digital format and distributed through the net, leads to the need of useful and usable tools to manage electronic resources. The management of these resources is mainly based on saving the web address of the resource and, on the other hand, retrieving resources previously stored. The user experience of the bookmarking tools is an important part of their success and, for this reason; their usability evaluation is of great importance. In this work, the main goal of the evaluation of bookmarking tools was to detect their strengths and weaknesses, both in terms of ease of use and utility, and thus diagnose their best use in an educational context.

The evaluation of tools in this work was carried out using a heuristic evaluation, a classic method for usability evaluation. This method was chosen because it is a reliable method for discovering usability issues and provides information about the shortcomings and strengths of the tools studied. Heuristic evaluation is an usability inspection method that is used to identify usability problems of interfaces [6]. This type of evaluation is usually carried out by one or more experts. The evaluators study the interface and confront it with a set of heuristics or rules previously established. Heuristic evaluation was defined by Nielsen and Molich in 1990 to study and analyze the compliance of an interface with usability principles. The heuristic principles are usually structured in the form of checklists, thereby facilitating the evaluation. For each heuristic, indicators are formulated as questions, where an affirmative answer indicates the absence of a usability problem.

To evaluate the bookmarking tools we involved three expert evaluators. They decided to use the heuristics defined by J. Nielsen [7] as they cover the main aspects to evaluate and they provide sufficient flexibility to adapt and define the indicators of each principle to evaluate the characteristics of the tools in educational contexts. The evaluators also selected the tools to analyze and each expert assessed all the selected tools. The indicators for each principle were measured in terms of 0 = never meets the requirement, 1 = sometimes, 2 = meets the requirement.

From the available bookmarking tools, experts selected four tools: Delicious, Google Bookmarks, Evernote and Diigo. The main features of bookmarking tools are storing and retrieving found links to Internet resources. The selected tools provide these basic options, and also other features that are considered important, such as: remote storage of information, sharing resources with other users, post links to resources and the capacity to import and export the stored data. With these capabilities, these tools are suitable for educational contexts in general.

4 Evaluation Findings and Discussion

In the visibility of system status principle, all tools got similar results. Evernote gets a higher score because provides more feedback to the user. From the visibility point of

view the four tools are adequate for the management of information in educational contexts. In the second principle, match between system and the real world, all tools get good score in the evaluation. Experts highlight Diigo feature about annotations on web pages being a clear metaphor of the real world. The interface and interaction design show an effort to make things intuitive and provide a good experience to the final user. This is an important aspect in educational settings because the user's goal is to read and learn the bookmarks and not the management of the URL. The less time devoted to learning and using the tool the more time for learning they will have. Related to the user control and freedom principle, all the analyzed tools provide effective solutions to go back and to return to previous state. The four tools are rated similarly but Evernote got a better result thanks to the software options it provides both for browsers, mobile devices and desktop operating systems. This software enhances the bookmarking tool and provides great versatility in its use and this is a key aspect of tools in an educational context. Students and teachers can use the tool according to their requirements, device of preference and features needed. In the consistency and standards heuristic, Delicious and Diigo obtained a highest score because its visual design and the carefully elaboration of details. Consistency and standards reduce cognitive load in the interaction with systems and this is an important aspect in educational contexts where the intellectual effort should be devoted to the topic or subject of learning itself. Related to error prevention, all evaluated tools receive the same score. Each one is simple enough not to allow the user to carry out errors and, at the same time, offer complete and sometimes complex features and options. Nevertheless, users cannot be completely controlled and always can carry out unwanted actions. The results obtained in the evaluation of the recognition rather than recall principle place Google Bookmarks in an inferior position to the other tools. This is because the tool makes primary use of a textual design against a design that uses images and icons. The main drawback is that Google Bookmarks does not make clearly visible the major options needed in a bookmarking tool. The heuristic principle about flexibility and efficiency of use is related with the ease of use of the tool. The tools need to be useful and easy to use for novel users as well as for experienced users. In this evaluation, Evernote has the highest punctuation as it offers a set of functionalities richer than the rest of the tools. Both Evernote, Delicious and Diigo are tools that offer a great flexibility. The principle about aesthetic and minimalist design means that bookmarking tools should have the needed information and elements not essential produce interferences in the user. Evernote tool has the lowest punctuation as its interface has a lot of elements, but this can also be as it is the tool with more functionalities. Google Bookmarks gets very good results on this principle but offers fewer options and features. In the principle about help users recognize, diagnose, and recover from errors, all tools show errors if occur and provide explanations for users to recover from this situation. The design of the tools is made in a way that users choose options that usually do not lead to mistakes. Anyway, the most common errors are related with the erasing of data without intention. Google Bookmarks do offers the possibility of recovering immediately and Evernote keeps in the trash the deleted elements offering the possibility to save the needed data. The help and documentation principle evaluates how easy can be finding information about the software functionalities when needed, if the user can search among the help information and how well structured and organized is the training information. Evernote, is the tool with highest

score in this evaluation aspect mainly thanks to the excellent help and documentation section it offers. Delicious also provides a good help section but it is not that well organized and clear. The help and training offered by these kind of tools is very important in educational contexts where additional support is very important for students.

The main finding of the evaluation was that although there are tools better scored than others, all analyzed tools are suitable for use in educational contexts and, nevertheless all of them have advantages and disadvantages. It is very easy to add resources and links on all the tools and almost all of them provide additional software to do so. On the other hand, the recovery of stored resources is a complex task in all tools. Search interfaces are good but users must remember the keywords of the resource and, sometimes, these are very generic. Navigation interfaces are also good and well designed, but the tools provide little support for browsing and finding resources because navigation depends mainly on the classification and labels the user defined when he / she saved them and, therefore, rely almost solely on the methodology used by the users, that is, in their information skills.

The top rated tools are Evernote and Delicious. These tools have interesting features when used to store and manage learning resources. Evernote provides additional functionality and allows to store files, both text and multimedia, and also easily retrieve information from these files. This is an important aspect in an educational setting where not only it is necessary to manage references and links to resources but also to manage content itself. However this should not be the only aspect to consider when selecting a tool. Delicious, in turn, offers two important comparative advantages: its large number of users and the API that allows building a specific software application to access the stored information. Thanks to its number of users, Delicious builds a folksonomy based on the tags and keywords that users have used to label resources. At the same time, other users can take advantage of that when storing and accessing their own resources because the tool suggests the most appropriate labels for each link. Diigo offers to annotate and comment on web pages and resources, a useful functionality in education. Students and teachers can annotate, comment, edit and discuss content on web pages without having to modify or edit the content itself.

5 Conclusions

One important aspect of the bookmarking tools is that although the basic tasks to perform (save, retrieve and search links) are seemingly simple, they hide some complexity. With the current available tools is very easy to store information and, at the same time, it can be a very difficult to find and retrieve this stored information. Consequently, it can be stated that the design of current bookmarking tools favors information behaviors more focused on saving resources for later than using them right later on. As a main consequence, users need to acquire information competences in order to manage in our current society and overcome the shortcomings of available tools.

In an educational context, the user information goals and tasks have a different dimension that may affect the design and usage of these tools. In these settings, students and teachers have specific goals and tasks which are different from other kind of

users. Moreover, the social aspects of social bookmarking tools arise as a very good element that allows interaction among students and teachers.

Therefore, the inclusion of social bookmarking tools in these settings require further research and elements to consider such as the specific learning and teaching needs of users – as it has been mentioned –, the characteristics of the learning virtual environment; and the information skills of users related to maintaining the ease of storing resources, prioritizing and promoting their later retrieval using search tools or navigating through taxonomies or folksonomies.

To pursue the initial research presented in this paper, we plan to 1) study of information management behavior of our students and 2) run an initial pilot with a bookmarking tool integrated in our learning environment in order to evaluate its usage. This analysis of the user experience of social bookmarking tools in a specific environment such as e-learning will also help advance in the design of these tools.

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References

1. American Library Association: A Progress Report on Information Literacy: An Update on the American Library Association Presidential Committee on Information Literacy: Final Report. American Library Association, Chicago (1998)
2. Castells, M.: The Information Age: Economy, Society and Culture, vol. 1. The Rise of the Network Society, Blackwell Publishers, Oxford (1996)
3. Geser, G.: Open educational practices and resources - OLCOS Roadmap 2012. Open eLearning Content Observatory Services (2007)
4. Bruce, C.S.: Information literacy as a catalyst for educational change: a background paper. White Paper prepared for UNESCO, the U.S. National Commission on Libraries and Information Science, and the National Forum on Information Literacy, for use at the Information Literacy Meeting of Experts. Prague (2002)
5. SCONUL: Information Support for eLearning: principals and practices (2003), `http://www.sconul.ac.uk/publications/pubs/info_support_elearning.pdf`
6. Nielsen, J., Molich, R.: Heuristic evaluation of user interfaces. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems: Empowering People, pp. 249–256. ACM Press, New York (1990)
7. Nielsen, J.: Usability Engineering. Morgan Kaufmann, San Francisco (1993)