

Enhancing Library Services with Web 2.0 functionalities

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Abstract. In this paper, a prototype of an Online Public Access Catalog (OPAC) is presented. This new OPAC features new functionalities and utilizes web 2.0 technologies in order to deliver improved search and retrieval services. Some of these new services include social tag annotations, user opinions and ranks and tag-based similarity searches. The prototype is evaluated by a user group through questionnaires, interviews and with the system's integrated logging mechanism. The results are encouraging enough and show that Library 2.0 technologies seem to be acceptable by the majority of the users.

Key-words: Web 2.0, social tagging, subject representation, OPAC, evaluation

1 Introduction

The Online Public Access Catalog (OPAC) is the library's main tool for locating material inside it. Until now, OPAC systems are tied directly to the library's main catalog restricting the user to search/browse only its content. In the last few years, the diffusion of digitization and digital library repositories have urged libraries to digitize part of their content and provide this content directly to their users through the various digital library systems [11]. Furthermore, in order to encourage users to organize and access the existing resources according to their needs, libraries enhance their services using Web 2.0 technologies (social tagging, annotations, etc.) [8].

Web 2.0 technologies are user-centered and recently widely spread providing collaborative, interactive and communicative infrastructures and services for the creation and consumption of content. These technologies change the way the users select and organize available information. In particular information is not created and classified only by experts or creators but also by the users.

According to Michael Casey "*Library 2.0 is a user-centered model for library services that encourages user participation in the creation of both the physical and digital services, supported by the consistently evaluating services*" [4]. The concept of Library 2.0 is the generation of a social network interface, where the users exploiting RSS feeds, wikis, tags can't only search for books and other material, but communicate and share knowledge. Libraries are already moving into Web 2.0, but the move has only just begun [12].

Collaborative tagging is the practice whereby users assign uncontrolled free keywords to the resources. They enrich diverse resources like photos and video to scientific papers and web pages. A recent research reports that the 28% of internet users put tags for several reasons [15]. Mainly they create tags to serve their own needs. But the social aspect of tagging is that it generally makes a participant's tags and resources visible to other participants [17]. The set of the tags introduced for a resource is called *folksonomy*, which it could be presented as a *tag cloud*. Users can click on a particular tag of a tag cloud, to access resources associated with it. Thus the introduction and usage of tags creates clusters of similar resources accessible by user communities.

In this paper we introduce OPACIAL¹, a prototype library information integration system that incorporates Web 2.0 technologies, developed by the Panteion University Library, Athens, Greece. Moreover, a qualitative evaluation framework is presented utilizing the system's logging subsystem, questionnaires, and user interviews in order to explore the system's advantages, weaknesses and its acceptance by the users. OPACIAL functionalities are also compared to other state-of-the-art Library 2.0 systems available worldwide and are presented in section 2. The system requirements are presented along with the system architecture in section 3. The evaluation framework and results are presented in section 4, followed by the paper's main conclusions of the research and our future plans.

2 Related work

During the last few years some libraries allow users to tag catalogue items and Internet resources. For instance the Penntags² project of the University of Pennsylvania has developed a social tagging system which integrates social tags with the OPAC as well as the documents taxonomy. This service provides browsing to the library material using either the thematic hierarchy defined by experts (i.e. information scientists, or social tags which correlate and interlink the material under various contexts).

Additionally, a public library, the Ann Arbor District Library (AADL), has integrated into the library catalogue a social networking system called SOPAC. It offers to the users the ability to rate, review, comment-on and tag the library items [2]. Specifically the users are encouraged to tag titles and write reviews and jot notes on an interface which resembles to an old fashioned catalog card. Eli Neiburger, IT manager for AADL, reports that 6700 individual cards have been saved to personal card catalogs to date and roughly 4000 notes made so far on the cards throughout the catalog at a rate of about 200 comments per month. That high level of reader involvement strongly indicates that readers want, and will take advantage of, similar opportunities to interact [19, 16].

Another pioneer, Hennepin County Library (HCL), MN, forges new Library 2.0 ground with its innovative BookSpace page. There, suggested book lists (like Amazon.com's Listmania) are created by librarians and users. The interaction

¹ <http://library.panteion.gr/opacial>

² <http://tags.library.upenn.edu/>

opportunity has been enthusiastically embraced by the readers: 270 lists were contributed in the first six months of BookSpace's launch, and the library averages about 600 comments per month on items in the catalog [19].

VuFind³ is a freely available library resource portal which combines the functionality of a traditional library catalogue with the features found in modern web applications, and aims to make resources to be easily discovered and requested. Users can browse the library catalogue to retrieve available documents and also can narrow down their search using facets. Moreover the system offers interesting features such as tagging, reviewing, annotating and citing the records they are interested in.

Scriblio⁴, is a free and open source information architecture created by Plymouth State University. It is based on WordPress (<http://wordpress.org/>), which offers rich content management features and among the others provides faceted searching and browsing. Using the newly released book view ability API by Google Book Search, Plymouth State University's Library is one of the first libraries which moved beyond of simply listing their books online and open them up to reading and searching via the web. In Scriblio, catalogue records are posted as blog entries, can be tagged and are enhanced with a variety of alternative search tools increasing the possibilities of finding items, including Google [1,10].

AFI-OPAC 2.0⁵ is open source software designed for public libraries. It sets up a community portal around the library collection. It incorporates Web 2.0 technologies like RSS, social tagging, opinions of readers and also has connected with wikipedia.fr to present the biographies of the authors.

The Powerhouse Museum launched a new catalogue that is inspired by the technologies of Web 2.0. The system, called OPAC 2.0, provides a number of key features like folksonomies (user keywords, tagging) and search recommendations. Chan [5] examined a huge number of query terms posed to Powerhouse and concludes that the combined usage of folksonomies with taxonomies increases the recall of the information seeking process.

Concerning the proprietary Web 2.0 software for OPACs, Aquabrowser and Primo are the most popular packages [3]. Primo offers tagging and faceted browsing functionalities as well as it allows the signed-in users to write and submit reviews on the retrieved items. Aquabrowser appears for each search term a "constellation" of related terms (subjects, thesaurus terms and spelling variations). Terms more closely related appear close to the search term, while terms colours correspond to different kinds of associations.

³ <http://www.vufind.org/>

⁴ <http://about.scriblio.net/>

⁵ <http://afi.opac.2.0.free.fr/>

3 System development

3.1 Requirement analysis

The first step to design an OPAC 2.0 system is requirements analysis. During this process, the user's needs must be gathered, balancing the system complexity (in terms of development and maintenance) and performance.

Initially a comparison of the offered functionalities by the Library 2.0 systems mentioned in section 2, was performed. Table 1 summarizes the results of such a comparison.

Table 1. Social OPAC software evaluation table

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
SOPAC AADL.org	N	Y	N	Y	N	Y	N	N	Y	N	Y
PowerHouse Museum	N	Y	N	Y	Y	N	Y	Y	N	Y	N
AFI OPAC 2.0	Y	N	Y	Y	N	Y	N	N	Y	Y	N
VuFind	N	N	N	Y	Y	Y	N	Y	Y	N	N
Scriblio Plymouth UL	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y

F1: Tag recommendation, **F2:** Tag cloud browsing, **F3:** Refinement of searching using tags incrementally, **F4:** Faceted browsing, **F5:** Search using tags. **F6:** Combined standard./tag search, **F7:** Tag based item retrieval, **F8:** Digital library integration, **F9:** User opinions/rank, **F10:** Similar Check out, **F11:** Reference tools.

Actually, the requirements gathered by the bibliography review are the following:

Information presentation abstraction should be used to split a large amount of information presented to the user into logical groups.

Conventional and customizable search interface should be available to cover basic needs as well as to provide a more focused search. Further, faceted navigation is required.

Tag-based search and browse so that users can input their own tag cloud. Compound words should be used to make the tagging subsystem flexible. The system should be able to retrieve relevant records based on the user's tag cloud. Moreover successive tag selections should operate as faceted information retrieval and narrow down the retrieved records.

Tag-based similar items retrieval. The system should be able to retrieve items supplied with social tags similar to the tags of a particular record.

Tag recommendations. The system should provide the user with recommended tags during the annotation process in order to minimize the polysemy problem [13,14].

Digital repository integration capable to retrieve for each OPAC record similar objects of a digital library.

User annotations and ranking and Use of reference tools. The users should be able to annotate and rank each resource it (on a 1-5 scale) and to export a record to

external social networking sites (like Del.icio.us, CiteULike), by using a social networking site aggregator such as Socializer⁶.

3.2 System architecture

Based on the above requirements analysis, a prototype system would require the following set of resources: (a) a repository that holds the MARC records (the library's main catalog). It should be mentioned that Panteion University Library has developed a rich and coherent subject index based on the Library of Congress Subject Headings translated into the Greek language. (b) a repository that holds the digital library records (the library's DSpace system), (c) a social tag database, (d) a physical location database, which depicts the conventional material to the library building and (e) an annotation database.

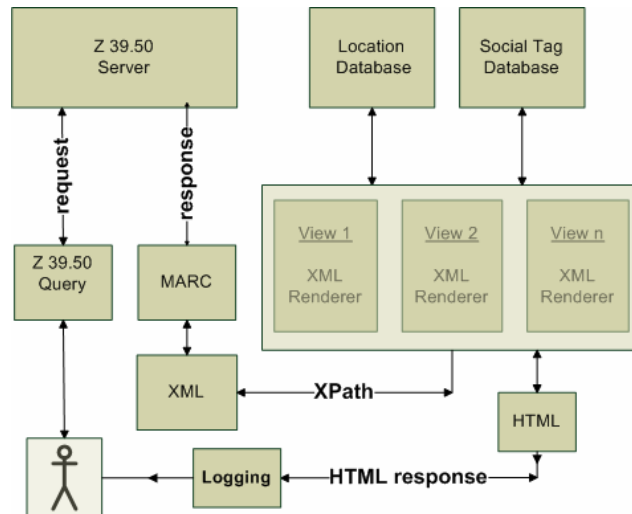


Figure 1. The overall system architecture

Consequently, the described prototype is heterogeneous and able to integrate different technologies. The development framework of the proposed system is shown in Figure 1. The overall system architecture utilizes a Z39.50 server a MySQL relational database and a PostgreSQL database (DSpace repository). The first is required to retrieve the OPAC records, the second to retrieve social tags, reviews and physical location information, while the latter is used to obtain information from the digital library.

The MARC format of the OPAC records are transformed into Unicode and then into XML. In order to increase the system usability an information abstraction layer has been applied in order to break down information into smaller groups and present these information horizontally to the user. As a result, the following records views are

⁶ <http://ekstre.me.com/socializer>

used: (a) general record information, (b) holdings and physical location and (c) social tags and user reviews. Each view is rendered as html format using a view renderer which has been constructed for this specific purpose. The number of views and their contents can be modified through an administration interface. The view renderer, parses the xml record, find the required information regarding each view (elements, subelements and how to present them) and transforms the xml into html just like an xslt processor transforms xml data to html format using an xslt stylesheet. The view renderer uses XPath and XQuery to perform all these functions.

Διεθνείς Σχέσεις Anywhere Search Advanced Search

Found: 11 results (2 pages) Pages: 1 2

Politics among nations : the struggle for power and peace / Hans J. Morganthau ; revised by Kenneth W. Thompson.
 by: **Morganthau, Hans Joachim, 1904-** Thompson, Kenneth W., 1921- (Editor)
 status: Επιστροφή:26/05/08 20:00
 call number: 327.MCR

Man, the state and war : a theoretical analysis / Kenneth H. Waltz ;
 by: **Waltz, Kenneth Neal, 1924-**
 status: Στο ραφι
 call number: 303.66.WAL

Theory of international politics : Kenneth H. Waltz ;
 by: **Waltz, Kenneth H., 1924-**
 status: Στο ραφι
 call number: 327.01.WAL

Neorealism and its critics : Robert O. Keohane, editor ;
 by: Keohane, Robert O., 1941-
 status: Επιστροφή:31/01/08 20:00
 call number: 327.101.NEO

Εργονομία στη μεθοδολογία της πολιτικής επιστήμης : Stephen Van Evera ; μετάφραση Έλλη Σολογίδου
 επιστημονική επιμέλεια Ηλίας Ι. Κοσκινιάδης.
 επιστημονικό σημείωμα Αθανάσιος Πλατιάς.
 επιστημονικό επιτηρητικό όργανο και εκδοτικό Παναγιώτης Ήρσατος.
 by: **Van Evera, Stephen** Σολογίδου, Έλλη (Translator)
 status: Στο ραφι
 status: Στο ραφι
 call number: 320.01.VAN

Διεθνείς σχέσεις και στρατηγική στον Θουκυδίδη : Αθανάσιος Γ. Πλατιάς ;
 by: **Πλατιάς, Αθανάσιος Γ.**
 status: Στο ραφι
 call number: 327.011.ΠΛΑ

Το νέο διεθνές σύστημα : ρεαλιστική προσέγγιση διεθνών σχέσεων / Αθανάσιος Γ. Πλατιάς ;
 by: **Πλατιάς, Αθανάσιος Γ.**
 status: Στο ραφι
 call number: 327.ΠΛΑ

Ελληνική απορροπή από τη στρατηγική : Παναγιώτης Ήρσατος, Αθανάσιος Γ. Πλατιάς ;
 by: **Ήρσατος, Παναγιώτης** Πλατιάς, Αθανάσιος Γ.
 status: Στο βιβλιοδέτη
 call number: 355.0209495.ΗΡΑ

Η τραγωδία της πολιτικής των μεγάλων δυνάμεων : John J. Mearsheimer ; μετάφραση Κωνσταντίνος Κολιτσάκης.
 επιστημονικό σημείωμα Κωνσταντίνος Αρβανιτίδης.
 επιστημονική επιμέλεια Παναγιώτης Ήρσατος. - Ηλίας Κοσκινιάδης.
 by: **Mearsheimer, John J.** Κολιτσάκης, Κωνσταντίνος, 1971- (Translator)
 status: Στο ραφι
 call number: 327.101.MEA

War and change in world politics : Robert Gilpin ;
 by: **Gilpin, Robert**
 status: Στο ραφι
 call number: 327.1072.GIL

Tags
 Deliburck Offensive Realism Status Quo Άμυνα Προσέγγιση Έκταση Προσέγγιση Αθήνα Αλλαγή Αποτροπή Διεθνείς Σχέσεις Διεθνής Ασφάλεια Διεθνής Πολιτική Διεθνείς Σχέσεις Απολυτός Ελληνοαμερικανικός Πόλεμος Επιθετικός Ρεαλισμός Επιστημολογία Ηγεμονική Θεωρία Ηθική στην Διεθνή Πολιτική Θαλάσσια Στρατιά Θεωρία Πόλεμου Θουκυδίδης Ιστορία Πόλεμου Ισχύς Κερσό Μεθοδολογία Πελοποννησιακός Πόλεμος Περιλήψεις Πολιτική Επιστήμη Πολιτικός Ρεαλισμός Ποικιλία Στρατηγική Στρατηγικός Σχεδιασμός Στρατηγική της Ευκαλιπιδέας Στρατηγική της Εξουλιπιδέας Σύστηματικό Ρεαλισμός Ψαράι του Χίτσινγκ Φιλελευθερισμός Χιτσινγκ Ισχύς Ψυχρός Πόλεμος

Item Type
 Books

Year
 1979 , 1981 , 1983 , 1986 , 1992 , 1993 , 1995 , 2000 , 2001 , 2007

Subjects
 Διεθνείς σχέσεις
 Πόλεμος
 Διεθνείς σχέσεις -- Φιλοσοφία
 Κράτος
 Παναγιώτης Πλατιάς -- 1945-
 Πολιτική επιστήμη -- Μεθοδολογία
 Ευρωπαϊκή
 Ελλάδα -- Σχέσεις -- Τουρκία
 Κύπρος -- Διπλωματικές σχέσεις
 Παναγιώτης Πλατιάς -- 1945-
 Παναγιώτης Πλατιάς -- 2006-
 Μεγάλες δυνάμεις
 Διεθνείς σχέσεις -- Ελλάδα

Related Items on Pandemos
 Η Περικλής κληρονομιά προσέγγιση Διεθνούς Συντακτικού και Διεθνούς Σχέσεων
 Η εκδοτική ιστορία Κοσκινιάδης και των Σπανιόλης με τη διεθνή χαρακτήρα της κοινωνικής αυτοκρατορικής εξουσίας. Ιστορ. Π.Δ. Μεσο-Μ.Α., 2000
 Η κοινωνία του κειμένου παλιού: εξουσία και επιρροή υπηρεσιών, εκδόσεις - εφόδια
 "Πόλεμος και τα έθνη: μια γνώση και ελεγμένη". Ο Δ. Σπανιόλης σε διεθνή συνέλευση στην εναποκαταμένη Ελλάδα

Figure 2. A search results page.

A simple case scenario is as follows: the user types the query in the appropriate search box, selects the scope of the search and after clicking the Search button, is presented with the search results (Figure 2). The tag cloud that describes the results, is displayed on the top right corner. Below this box, two more boxes are appeared helping the faceted navigation by item type (book, journal, etc.) or publication date. Next, a subject facet box is presented that contains all the subjects of the results

shown. Below the subject facet box, a box that contains the related items of the digital library is presented.

When the user clicks on a record, three views of the record's information are presented. The first view (Figure 3a) contains the record's main information (title, author, subjects, publisher, etc.). The second view (Figure 3b) contains the social tag information and the users' opinions and ranks of the record. The third view (Figure 3c) presents the holdings of the record and its physical location on the library map. In all views there are two boxes on the right that display the record's related tags and the related records that were retrieved based on their tags. OPACIAL will be demonstrated during the conference and is available for download from SourceForge (<http://opacial.sourceforge.net>).

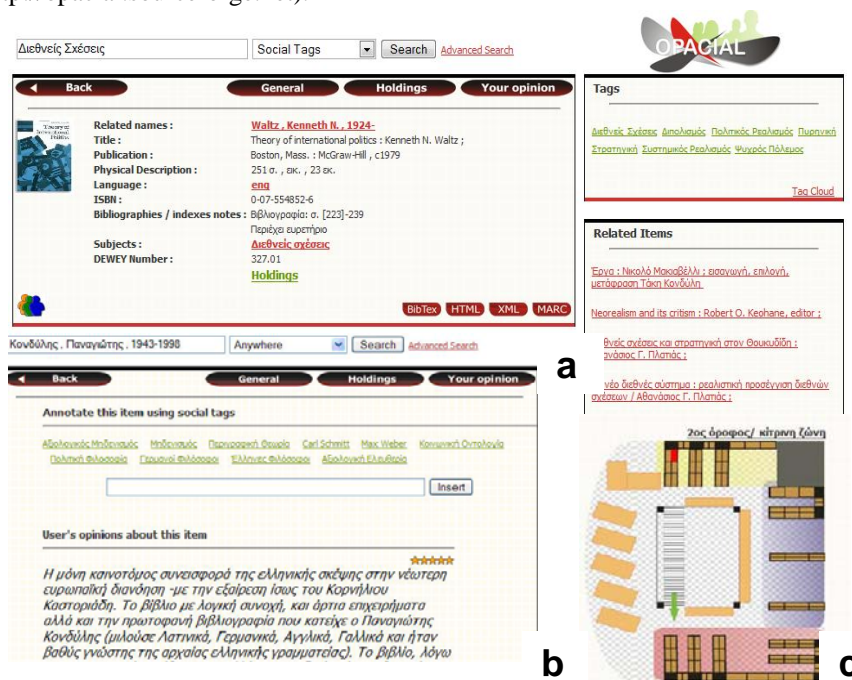


Figure 3: Three views of a record. (a) General information (b) Record tagging screen (c) Physical location

A critical system module is the logging subsystem. Through logging it is possible to monitor user activity, system usefulness and identify bottlenecks in the user interface architecture. Furthermore, through logging it is possible to evaluate the proposed system. All the information required to track all user activity is encoded into the URL of each request. Thus, the logging subsystem is called within the view renderer in order to enrich all the system's URLs with logging information.

4 Evaluation

In summary, OPACIAL provides the user with tag recommendations in order to maximize consistency and minimize the synonym/polysemy words. Moreover it provides the tag cloud referring to a list of items, while the users can use tag names to search and retrieve items. Actually a user when clicks on tag1 and then on tag2, the results of the expression (tag1 AND tag2) are returned. Additionally, the system displays related items stored either in OPAC or the digital library, based on tag similarity. Finally, OPACIAL allows the users to comment on an item and/or rank it as well as to store the retrieved records to other social networking sites through Socializer (Delicious, CiteUlike) and in Bibtex format. Finally it supports faceted browsing by displaying the items various views such as publication date, language and material type (book, journal, etc.). However OPACIAL currently does not support combined search mechanism allowing the users to search using simultaneously tags and subject terms and do recommend items based on other users loans.

The investigation of OPACIAL acceptance by its users prerequisites an evaluation model tailored especially for its functionalities, based on a set of research hypotheses, as well as a specification of an experimental procedure to verify or not the posed hypotheses.

4.1. Experimental setup

Several researchers agree that usefulness and usability are the most significant concepts for the user-centred evaluation of information services [6,7,17,18]. Thus the OPACIAL evaluation aims to investigate how useful and easy are the new library services. In particular the posed research hypotheses are: (H1) how important is the social tagging for the users information seeking process, (H2) what is the difference in information search success between the usage of tags and the subject terms recorded in the library catalog and (H3) how easily users can access the new services. Consequently the evaluation criteria are:

- Relevance: how relevant items to the user needs returns the tagging functionality
- Reliability: could the tags guide the users queries
- Format: is the integration of OPAC records with object from the digital library helpful
- Timeliness: by examining the tags awareness
- Learnability: how easy to learn is the navigation using the tag cloud as well as the service interface
- Navigation: how easy is the navigation using the tag cloud as well as the service interface
- Information architecture: how usable is the information frames in the users desktop
- Aesthetics: which is the user opinion concerning the interface design.

The first four criteria correspond to the usefulness concept, while the rest correspond to usability.

OPACIAL was presented to nineteen (19) students and faculty members chosen under the criteria of the frequent library and Internet services usage. Firstly, a profile was created for each user based on its demographic information and educational level, its satisfaction of the outcomes of their queries using the subject authorities provided by the library OPAC, its familiarity with the Web 2.0 technologies, its interest in tagging items and reading annotations of other users. Afterwards a usage scenario was given to the participants consisted of the following tasks: OPACIAL navigation, search for items using the existed library subject headings, examination and usage of relevant subject headings appeared in a separate frame on the desktop, examination of the retrieved relevant objects by the digital library, introduction of tags to records of their interest (the scenario required them to introduce at least ten tags to records of their interest), annotation of a record and finally search and browse by tags. Each participant took five days to learn the system functionalities and then was interviewed. Interviews aimed to give the users the opportunity to express their opinion freely, without losing control of the discussion. Therefore, semi-structured interviews were conducted based on both open-ended and closed questions to compensate for the drawbacks of each form. The open-ended questions aimed at gaining a better insight to the interviewee's perspective towards the new service. On the other hand, closed questions were used to get a clear understanding of the interviewee's attitude towards the usability, usefulness and satisfaction rates for OPACIAL. These attitudes were assessed using 7-point Likert scale, with 1 being in the negative side and 7 being on the positive side of the scale. Each interview had an average duration of 30 minutes.

4.2. Results

Regarding the users' profile 37% are women, 37% PhD students, 16% MSc students, 10% undergraduates and 37% faculty. In addition, the participants belong to almost all the departments of Panteion University, the most of them are heavy users of Internet and all of them are aware of Web 2.0 technologies. The 50% of the participants search information by subject, 18% search using the title or author indexes, while the 32% search information by name and title and the rest combine search terms either from the subject, or title, or author indexes. According to table 2, users are not very satisfied by the old catalog offered information searching functionalities, although the high level quality of the Subject Headings authority files of Panteion University. The average grade of their satisfaction is around 5 in the 7-point Likert scale (1 corresponds to negative satisfaction, while 7 to positive).

Table 2. User satisfaction when retrieve information by subject

Role	Mean	Std. Deviation
MSc students	5.33	0.577
Phd students	4.43	1.134
Professors	4.86	1.464

In general users find both the old and new search interfaces very easy to use (average value 6.0, in both interfaces). However the OPACIAL interface, which

presents on the desktop the similar subject headings, increases the search success rate (average using OPACIAL 5.11, std deviation = 0.809, average using the existing OPAC 4.74, std deviation = 1.147).

The most important finding of the interviews is that the users find the tagging functionalities useful as well as usable and therefore the tagging service satisfaction is highly rated (see table 3). During the experiment time period 442 tags have been inserted in the system. It is worth mentioning that the participants before using OPACIAL, rated the usefulness of the tag introduction and the searching using tags functionalities by an average grade of 5.47. After experimenting with OPACIAL, the users rated the reliability of searching using tags with the average grade 6.37. Moreover users prefer to search the library catalogue by using in parallel the tags with the existing subject headings. Specifically the users' view is that the tags play a complementary role to the existent subject index. Some of them use tags either to describe more precisely the OPAC records, or to correct a wrong subject term. The majority of them (89.5%) agree that the presence of both subject heading and social tags in their desktops is very assistive. Finally the usability criteria (navigation and aesthetics) are highly rated.

Table 3. Tagging Functionalities results

Criteria	Mean	Std. Deviation
Timeliness	6.21	1.134
Relevance	5.37	1.257
Reliability	6.37	0.597
Format	6.68	0.478
Total Usability of tags	5.84	1.119
Satisfaction by the tagging functionality	6.37	0.761
Overall satisfaction	6.63	0.446

Besides social tagging, users are also satisfied by the other OPACIAL functionalities. Table 4 presents the average ratings of the perceived usefulness and usability as well as the users' satisfaction by the system. Users would like to access simultaneously relevant OPAC records and digital objects stored in the University digital library. Therefore the presence of related objects from the digital library is characterized very useful by all the participants. However the usefulness of the annotations functionality is reduced especially for faculty members. Overall, approximately ninety percent of the participants declared satisfied with the new service and they described it as innovative, interesting and interactive. All of them intended to reuse the new service and recommend it to a friend.

Resuming this preliminary study, we found that our first research assumption (H1) holds true, i.e. social tagging is important in the information seeking process. Referring to the second hypothesis (H2) users prefer to use both tags and the library subject index. Therefore they rated highly the usefulness and usability of the subject headings recommendation functionality. Additionally they are sceptical to browse the tag cloud and they are afraid of its size, which is expanding. Based on this remark a social tag searching functionality was added to the system.

Concerning the tag introduction functionality the users suggested that domain experts should be allowed to add tags in order to create folksonomies and suggested bibliography lists for user communities. Finally, referring the usability hypothesis (H3) the users found OPACIAL quite satisfactory.

Table 4. Usefulness, Usability and Satisfaction average rates

	Usefulness			Usability			Satisfaction		
	Msc	Phd	Prof	Msc	Phd	Prof	Msc	Phd	Prof
Recommend digital objects	6.33	6.71	6.71	7.00	6.63	6.57	6.67	5.86	6.14
Recommend subject headings	6.67	6.57	6.86	7.00	6.29	6.71	6.67	5.86	6.57
Annotate	5.33	5.71	4.14	6.67	6.43	6.14	6.67	6.14	5.86
Tag cloud	5.67	5.00	5.57	6.00	5.57	5.86	6.67	5.71	5.86
Total	6.67	6.43	6.57	6.33	5.57	6.00	6.67	6.57	6.71

5 Conclusions

In this paper an innovative library social software was presented able to integrate OPAC records with digital library objects. The presented system is comparable with the next generation OPAC software. Moreover a user-centered qualitative evaluation methodology was introduced and particular criteria were defined to assess the impact of the proposed software to the users of an academic environment. In general we could assume that the Library 2.0 technologies would be acceptable by the academic community as a complementary information seeking tool. Social tagging hide a core problem in information science: subject analysis and subject representation [9]. Users seek information based on their own conceptual structures and subject perceptions. Therefore social tags seem to be a significant feedback in the subject indexing process carried out by librarians.

According to the experimental results OPACIAL needs to be improved. Our research effort will focus on the development of semantic correlation mechanisms between the tags and subject headings. Moreover tag analysis is needed for understanding in depth the needs of user communities and to provide particular services. Finally extended experiments should be performed made in order to define accurately a set of criteria able to evaluate Library 2.0 services.

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