Tagging for libraries: a review of the effectiveness of tagging systems for library catalogues[1]

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Abstract

Early literature on tagging has been enthusiastic about the potential that it holds for libraries. Theorists have thoroughly analyzed the nature of tags, as well as the benefits and the problems for libraries: the positives and the negatives of tags compared to subject headings, how tagging can help libraries increase the findability of documents, what the benefits from user-created vocabulary are and so on. However, there is a gap in the knowledge of how tags actually work within the professional context of libraries. More evidence is needed if the library community is to understand whether tags present an exciting opportunity for libraries. The purpose of this paper is to review the literature regarding the implementation of the tagging process in libraries. The aim is to document evidence regarding this particular service within the range of library services provided to users.

1. Introduction

The popularity of tags grew with the advent of social media and networking web sites and brought an innovative element to what can generally be referred to as document description: users describing their own or someone else's documents or resources for personal (most of the time) purposes. Photographs, songs and URLs are a few of the

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resources that users enjoy assigning tags to as part of their daily activities within the World Wide Web. Today, tags are a dominant force that makes the long and difficult task of searching for information, especially "personal information." within the Web easier.

As a result of this popular trend, tags have, also, become a service that many libraries provide to users, or, actually, a service that users provide to libraries. Since users have become a part of the process known as subject description, users now have the potential to be more than searchers or browsers of information. They can in fact become contributors to professional experts that assign subject headings to documents and resources. This, however, is an ambitious goal; one that may not be that easy to achieve. Although tagging has been available to library users for several years, there is still no hard evidence of the success or the failure of library efforts to upgrade users to something more than patrons.

An important element of the tagging process on the Web is that the implementation of tagging as a process was necessary for several web sites, such as Delicious (www.delicious.com) and Flickr (www.flickr.com) that first introduced them. Their very existence relied, and still does, on user participation in order for those sites to provide services, become popular, and finally become "easy" for everyone to use and find information, since there were no experts to describe the available resources. In the case of libraries, however, there is a factor that must be considered or reconsidered; catalogues already exist and will continue to exist and function even without the help of the masses.

2. Literature review

A general comment regarding the literature on tags in document description is that many studies, especially during the early period that tags first emerged, have investigated social media web sites, like Delicious, to define and study the use of tags (for example, Golder and Huberman, 2006; Lin et al., 2006; Suchaneket et al., 2008). Although this was, to a point, logical, the library community needed more studies that focused on the investigation of user tags on library online catalogues per se. In the last couple of years, several studies have emerged whose focus has shifted from commercial web sites to library catalogues (Steele, 2009; McFadden and Weidenbenner, 2010; Anfinnsen et al., 2011). But even in this case, these studies center mostly around a social media web site called LibraryThing (www.librarything.com) (Smith, 2007; Rolla, 2009), while there are a few studies that investigate the tag systems of Online Computer Library Center, Inc. (OCLC) WorldCat database (www.worldcat.org) (Lawson, 2009) or other library catalogues (McFadden and Weidenbenner, 2010).

In order, however, to establish a clear view and understating of how exactly tags work for libraries, a shift from studying the use of tags of single library OPACs (Online Public Access Catalogues) is needed, specifically in online catalogues where the individual user for each library is willing to add tag(s) into the record(s) that he or she finds while searching or browsing the contents of the catalogue. Although the tagging systems of LibraryThing and OCLC WorldCat provide a solid context for studying and comparing subject headings with user tags – most notably the Library of Congress Subject Headings (LCSH) (Thomas et al., 2009) and the Medical Subject Headings (MeSH) (Lin et al., 2006) – and for determining the dynamics that tags have on

information retrieval, the library community should process data from libraries in order to evaluate the success and the effectiveness of the tagging systems, rather than from commercial web sites or cooperatives. One should also consider that although OPACs are web tools, users do not use them the way they utilize other web services.

Lu et al. (2010, pp. 764-5) have argued that the tag system's systemic nature incorporates a better system to locate documents than other indexing and metadata creation systems, because there is a higher possibility that indexers and searchers will "meet" each other on their way to describing or searching for a source through various subjects. This argument, however, should be tested in order to find out how exactly one user's tag(s) can effectively help another prospective user.

Mann (2008) noted in his interesting paper the disconnects between the theory that has prevailed in the last decade regarding the use of keywords and tags in document retrieval and the practice of providing information and education to library patrons when conducting research. He pointed out the attitude held by many researchers and professionals that the online catalogue should seamlessly cover "everything" and that there is a "knee-jerk dismissal of enduring cataloging principles only because they originated in times of earlier technologies" (p. 55). Other issues he suggested considering are the disdain for controlled vocabulary and cross-referencing because they include intellectual effort, the dismissal of the importance of LC class numbers for accessing the physical collection and the disregard of pre-coordinated subject strings and their importance in catalogue browsing.

Schwartz (2008, pp. 832-3, 837) pointed out the interdisciplinary and intercommunity nature of today's subject searching various resources on the Web and the lack of physical connection between the patron and the librarian when the former uses the online catalogue, which affects training in the use of controlled indexing languages, a development that has led to so-called guided navigation. On the other hand, Mann (2008, p. 70) suggested that the intellectual effort included in the cataloguing process, in particular regarding subject indexing of documents, helps librarians and users alike during the stage of document retrieval.

Spiteri (2006, 2007) argued about the value of folksonomies for public library catalogues and reported several elements that could help library patrons exploit the contents of OPACs, like the creation of personal information space, the supplement of controlled vocabularies and, a rather ambitious goal for libraries, the creation of online communities of common interests (2006, p. 76). Bischoff et al. (2008, p. 206) wrote about the use of tags on the Web and created a typology of tag contents: topic, time, location, type, author/owner, opinions/qualities, usage context and self-reference. Lee et al. (2009) noted that users must become familiar with the tagging process in order to provide quality keywords to be shared. Wang et al. (2010**)** emphasized the importance of personalization of any tagging system to users' preferences in order for the system to be successful.

Gardner (2008) presented the challenges and changes that cataloguing in libraries have faced over the last decades, such as access vs. ownership, the changing publishing landscape and the need for online catalogues in the age of full-text access. Matheson and Davidson (2007) pointed out that although users can follow links to selected

electronic resources, the catalogue itself has experienced few changes. In addition, Trant (2008) reviewed the literature on tagging and folksonomies and concluded that the early studies were mostly descriptive with a focus on the theory behind tags, while West (2007) reported on the similarities among various tagging systems.

Mann (2008) focused his arguments on the context that libraries primarily aim to satisfy the information needs that derive from "scholarship" and not from the process that most users are familiar with in their everyday web lives -- fast information seeking via one word entry in Web search engines. He also argued about the differences between "scholarship" and "information seeking," which can assist in the debate regarding the use and usefulness of tags in libraries:

> Scholarship requires linkages, connections, contexts, and overviews of relationships; quick information seeking is largely satisfied by discrete information or facts without the need to also establish the contexts and relationships surrounding them. Scholarship is judged by the range, extent, and depth of elements it integrates into a whole; quick information seeking is largely judged by whether it provides a "right" answer or puts out an immediate informational "brush fire" (p. 57).

One should also realize that the early use of tagging systems for libraries lacked the technology of today; especially the new "breed" of Integrated Library Systems (ILS) have on a large scale included new features that, to say the least, helped users and librarians implement and use the tagging system in an easier way. Tags co-exist with subject headings, tag assignments immediately appear in the record, folksonomies

provide a very basic hierarchical structure that help users link tags to each other and users can browse through tags, to name but a few.

2.1 Tags, tagging, folksonomy, tag cloud and their purpose

The meaning of the word *tag*, the process of *tagging*, which often leads to *folksonomy*, and the visual representation of tags, most commonly referred to as *tag cloud* are analyzed in several papers.

A *tag* is a meaningful word, phrase, code, URL, string of numbers or any other form of characters assigned by humans with the purpose of describing the content of a physical document or an online resource within the personal information space of each individual user. Commonly, those who tag a resource with keywords or *metadata keywords* are users of that environment, usually a web site, that the resource exists in; an understanding that might help the library community realize the reason behind the success of tagging in several social media websites. Furthermore, the documents or resources that the prospective user may choose to assign tags to include, but are not limited to, books or any other form of physical documents, buildings or any other type of human infrastructures, images, videos, songs, blog posts, web pages, websites, library records, databases, portals or any form of collective collections of the above, combined or not (Macgregor and McCulloch, 2006; Furner, 2007; Kim et al., 2010; Rolla, 2009; Kim and Choi, 2010).

In addition, the process of assigning tags to documents or resources is called *tagging* – or in several papers can be found as *collaborative tagging*, *social tagging*, *community cataloguing*, *democratic indexing*, *social annotation* or *cataloguing by crowd* –

which refers to the assignment of one or more tags to a specific resource, commonly within some kind of collection (e.g. a collection of photographs, URLs, books, etc.). Perhaps the most notable characteristic of this process is that not only do these indexing terms, the tags, not originate from any kind of controlled indexing language or authority controlled procedure but that they represent the thoughts, experiences and expectations of the common user. Usually, one must register on a particular website to be able to assign tags. Another characteristic of the tagging process is that often a user can assign only one word for every tag entry, which results in bizarre, at least from a librarian's perspective, subject descriptors such as "toread," "knowledge+management" or "the" (Golder and Huberman, 2006; Macgregor and McCulloch, 2006; Notess, 2006; Trant, 2008; Lu et al., 2010; Mai, 2011).

Within the library world, the creation of a controlled vocabulary of indexing terms, most commonly known as taxonomy, is vital for the daily operations of any catalogue and most notably for the success of the "search" and "retrieval" functions. Accordingly, the aggregation of all the tags assigned to the resources within a database or website by the users of that particular website or database results in the creation of a *folksonomy*, i.e. a taxonomy created by the subject terms assigned by users. It is also commonly known as *social classification*, *ethnoclassification*, *folk classification*, *distributed classification*, *open tagging*, *free tagging* and *social bookmarking*. This process allows users to organize the information they find, while browsing the contents of a system within a broader organization of shared knowledge that represents itself in the form of user assigned tags. The main goal of a folksonomy is to allow a community of users, who share the same interests in the present or in the future, to search and retrieve information within the defined borders of operation and scope of the website

that the folksonomy was created in (Notess, 2006; Schwartz, 2008; Trant, 2008; Rolla, 2009; Kim and Abbas, 2010).Vander Wal (2005) classified folksonomies in two typologies: broad and narrow. "Broad" folksonomies mostly refers to popular websites where many users assign popular tags to the same document or resource, while in a "narrow" folksonomy few users tag few documents or resources.

Furthermore, the term *tag cloud* refers to the visual display of tags using different text sizes, colors and connecting lines with the purpose of indicating the popularity of the terms or their relations to each other – sometimes referred to as *collaborative browsing*. The way a tag cloud works is that it emphasizes the popularity of certain tag words by making them larger and bolder in text and brighter in color, thus, making it easier for the eye to "catch" a tag within a "cloud" of many. Although a tag cloud's primary function is to pinpoint the popular terms within a particular folksonomy, thus making browsing through the contents of a website somehow easier, it has another purpose--to imply the relation that tags might have as broader, narrow or related terms. Tag clouds are probably the most popular visual interface for displaying the contents of a folksonomy within a website (Macgregor and McCulloch, 2006; Notess, 2006; Hayman, 2007; Wang et al., 2010).

Furner (2007) identified three different goals and purposes of tagging systems: a) to provide motivation for the individual user to assist him or her or others, b) to enhance the usability of the service itself by making content creation, searching and retrieval simpler and c) to reach an ultimate goal, which translates to the wider context of what led him or her to use the service in the first place (for example, write a thesis, enjoy a hobby, interact with the collection and so on). He goes on to categorize the implemen-

tation of user tagging within libraries in several different dimensions: the type of parent institution, the type of users that the tagging systems will be used by, the type of resources that will be tagged and the type of access that users will have in order to assign tags.

Moulaison (2008) wrote a review of tag services on the Web with an emphasis on how tags work and the community aspect of tag creation. According to Moulaison, tags will be assigned differently by each community of users, depending on the purpose that creates them. These purposes may be: a) a community of users to aid in the retrieval of information within the personal information space of individual users (exo-tagging) and b) to advertise the creation to other users, most likely on the Web (endo-tagging) (for example a covered song on YouTube) (p. 102). Another aspect regarding the nature and purpose of the tagging service is expressed by Zollers (2007) who argued that there are three emerging social motivations that enable and amplify the use of tags: opinion expression, performance and activism. Furthermore, according to Guy and Tonkin (2006), it is likely that the chaotic nature of tags is not the biggest problem that defines this process but the fact that tags try to serve two masters at the same time; the personal collection and the collection of documents as a whole.

On the other hand, a "traditional" library catalogue serves one master (its prospective user) and has one housekeeper (the librarian) who tries to serve his or her master in the best possible way. Although one might say that there are ongoing problems that define and re-shape this relationship, it might be wise not to disturb or interfere with it.

2.2 Controlled and un-controlled indexing languages

The purpose of this paper is not to define the natures of the controlled and un-controlled indexing languages. However, their natures are closely interwoven with the nature and the purpose of all tagging systems. For a short but well documented analysis of the various terms and concepts regarding the classification process, such as classification, taxonomy, typology, cluster analysis, etc., see Bailey (1994, pp. 3-10). He also points out the advantages of classification schemes, such as the reduction of complexity, the identification of similarities and differences, as well as the disadvantages inherent in those schemes, like their static natures and their unmanageability with large scales of data.

Kim and Choi (2010) compared folksonomies and taxonomies pointing out their differences, advantages and disadvantages. Steele (2009) also argued about the positives and negatives of controlled indexing languages in document description and information discovery, while Macgregor and McCulloch (2006), besides their reference to the positives and negatives of controlled indexing languages, analyzed several of their characteristics and functions.

Mann (2008, p. 85) reckoned that searching within multiple databases, using different search software and different kinds of vocabularies (controlled or uncontrolled) dumbs down all the features of this kind of searching to the level of common keywords. This is, he argued, an effective way to quickly find information, but it is inadequate if one wants to promote research among scholars. Buckland (1999) wrote about the five vocabularies that exist and expand within every information system, like the OPAC: authors, indexers, syndetic structure, searchers and formulated que-

ries. He emphasized the importance of vocabulary in Library and Information Science (LIS), especially in the creation and effectiveness of digital information systems. In addition, he stated that mapping terms between different vocabularies, i.e. authors, indexers and users, is increasingly needed in order to facilitate access to information for users who are less familiar with "formal" subject headings and metadata.

Mann (2008, p. 60) described how he found the solution to a difficult search query and argued about the advantages that the LCSH presented in that particular search versus the keyword search within the Web: a) the manageable size of retrieved documents, b) the library was in possession of the retrieved documents and c) the subject of the documents retrieved were actually what the user was searching for and not documents that happened to include some of the keywords somewhere within their texts. Also, he suggested that the lack of knowledge of how to perform subject searches via LCSH can be overcome with systematic basic instruction and not with the rejection of vocabulary control.

2.3 Comparison of subject headings to tags

Subject headings have had primacy in document subject description within the library world for decades. There is no evidence that there will be a change in orientation and the standards that libraries use in order to provide users with the ability to search the contents of their catalogues via a subject search. There is, however, a challenge at hand presented by the changes available to "traditional" retrieval systems, like the OPAC, within the range of new technologies and their progress. Such innovations, like the tagging systems, gives virtually anyone who is willing to devote some time to assigning subject terms (keywords, better known as tags) to a document or a resource

that he or she finds while browsing a website the opportunity to participate in document subject description.

There are, however, several issues to be considered before implementing a tag system and, even more, before discarding the importance of subject headings for libraries. Those issues or elements originate from the most basic scope that every library should serve; to provide information in an organized way. Therefore, it would be difficult for anyone to imagine a library that could serve its purpose based solely on the experiences and ideas of its patrons. Every discussion regarding the use of tags should be based on the self-evident admission that tags should co-exist with subject headings and their role should be to assist in document retrieval and not to replace them. Mann (2008, p. 77) suggested that folksonomies could be considered as desirable supplements to the formal indexing process but are terrible substitutes for the controlled vocabularies.

Schwartz (2008) compared the usefulness of subject headings in thesauri and tags, while Bianco (2009, p. 138) found that social tagging web sites are not largely utilized by medical librarians. Lin et al. (2006) concluded that there are more similarities among tags and automatic indexing than tags and controlled vocabulary indexing. In addition, Mai (2011, p. 118) pointed out a difference between subject headings and tags: in every tagging process there is no professional to assign the terms or to create classes of subjects, thus, the system has no external warrant. Kim et al. (2012, p. 62) argued that tagging facilitates the search process but also poses some considerable limitations regarding quality evaluation; a problem exacerbated by the fact that users

usually exploit a small proportion of the tags that are available to them and it is most likely that they rely on personal and self-referential tags.

Lin et al. (2006) stated that tags can be categorized into groups that have a specific and meaningful content and Ding et al. (2009, p. 2397) found that users often assign tags to objects for the current year or month. Other preferences that users have when tagging are geographical names, scientific domains, religions, computer programming languages and topics related to Information Technology. Other interesting findings in Ding et al.'s study included the use of both plural and singular forms for the same word and the use of acronyms and abbreviations. They also found that users use conjunctions, prepositions and articles to assign tags to objects.

2.3.1 Positives of subject headings

Rolla (2009) compared the tags assigned to the records of LibraryThing with the LSCH records of WorldCat and found that users incorporate more terms than cataloguers do (42,78 to 3,80 respectively), which may decrease search precision (p. 177). He also enumerated several of the positives that subject headings offer for information retrieval when conducting a search on library catalogues compared to user tags (p. 180):

- LCSH refer to classes of persons, while tags to abstract concepts.
- Free floating subdivisions allow cataloguers to expand or highlight special aspects of the topics at hand.
- Tags do not offer any chronological order of time periods, while LCSH have established chronological divisions for all countries and regions.

- Tags usually do not follow any grammatical or syntactical rules, nor do they control synonyms.

Lu et al. (2010, p. 766) found that the chronological subdivision of LCSH is the least covered by social tags and Gross and Taylor (2005, p. 223) concluded that discarding subject headings from library catalogues would result in a loss of about one third of the hits by users when conducting a keyword search.

Gardner (2008, p. 86) acknowledged that libraries ought to connect their collections to the physical community they exist in and listed the advantages that library records have over the full text of electronic documents (p. 88):

- Classification numbers
- Subject headings via authority control
- Names (personal, corporate, conference and geographical) as well as title (uniform and series) via authority control
- Other/alternate title information

She also considered classification and subject terms as a form of consistently used tags that group resources under the same topic and where the combination of subject headings, free text and user supplied tags is likely to augment the searching capabilities of library catalogues (p. 90).

2.4 From taxonomies to folksonomies, or not

There are several papers that address the issue of the differences that exist between folksonomies and taxonomies. Trant (2008) suggested that folksonomies should be explored in relation to other taxonomies in order to identify the value of tagging. No-

ruzi (2007) argued that the most notable characteristic of folksonomies is that those that assign tags are the primary users of the resources that are being labeled. She also stated that there are at least two vocabularies in every folksonomy system: a) users and b) searchers.

Quintarelli (2005), in her widely cited paper, outlined most of the differences that exist between traditional classification schemes and folksonomies.

On the negative side of folksonomies:

- There is a lack of precision and lack of synonym control.
- Tags have no hierarchy.
- Folksonomies do not favor findability but rather serendipity and browsing; their focus is not on searching.
- Finding specific content is not their purpose.

On the positive side of folksonomies:

- Folksonomies' weaknesses can become their strengths once seen as choices, a result of its open and adaptive nature.
- Folksonomies better represent a specific target's group understanding of the world and organization of relevant information.
- They manage to combine real user needs with their use of the language.
- The lack of authority control defines its inclusive nature. Everyone's thoughts, ideas and ultimately words are included.
- Through folksonomies, small ideas that do not follow the mainstream may emerge, a direct outcome of its inclusive nature.

- Folksonomies, although lacking in hierarchy and findabilty, enhances investigation and random discovery, which is also important in today's overwhelming amount of available information.
- Folksonomies follow a popular trend on the Web, where the masses have taken matters in their hands. Since it cannot be avoided, should libraries choose to utilize tags, it would help the cataloguing of resources in general.
- Controlled vocabularies are expensive and time-consuming. Folksonomies present the best next option especially where there is no "authority figure" to control the indexing process.
- Folksonomies are also a viable solution to classification even when faceted classification is available since they have less cognitive cost.

2.5 Positives and negatives of tagging and folksonomies for libraries

Realizing the possibilities, the successes and the potential failures when implementing a tagging system is crucial. Some of the successes could be enhanced and several of the disavantages could be anticipated if libraries had a solid understanding of what to expect from a tagging system, what should be avoided and what realistic goals should be set.

2.5.1 Advantages for libraries

On the positive side of tagging for libraries, Maggio et al. (2009, p. 82) reported that the use of tags helped students have a better understanding of MeSH. Rolla (2009, p. 178) argued that personal tags (i.e. tags that users assign for personal use, e.g. "mustread" and which do not describe the content of the resource) could contribute to an online library catalogue. For example, reserve collections could circulate among

students more easily if a professor tagged the appropriate content with tags containing the title of the course.

Sinclair and Cardew-Hall (2008, p. 18) found that tag clouds can help those who search information through a folksonomy's dataset, while Kipp and Campbell (2010) stated that users make the use of tags while searching for information. Pera et al. (2009, p. 1393) eagerly dismissed the importance of the "traditional" library catalogue; they argued about its ineffectiveness (e.g. a time-consuming process, difficulty in formulating search queries and irrelevant searches) in supporting the need to implement a tagging system. They proposed a system that correlates keyword searches by users with tags in LibraryThing which, according to their findings, could increase the effectiveness of library catalogue searches (p. 1405).

Another positive side of tags for libraries reported in the literature is that they support personal discovery and retrieval, while maintaining a low entry barrier at minimum cost (Schwartz, 2008, p. 837). In addition, tags can help improve access to library collection through subject search, the collective nature of folksonomies can correct the possible erroneous judgment of individuals and users usually describe a resource that has already been read or used (Rolla, 2009, pp. 181-2). Also, tags can adapt faster to the changing needs of users and vocabulary (Spiteri, 2006, p. 79; Lu et al., 2010, p. 765), they support social connection and serendipitous discovery (Schwartz, 2008, p. 837) and they are a fast way to add "dirty metadata" to digital content (West, 2007, p. 58).

Antel and Huang (2008, p. 73) found that library users rarely utilize the search tools and help available to them and that they experience a significant difficulty when using subject headings to conduct research, which results in low rates of success in document and information retrieval. This provides a fertile ground for tags to assist in document retrieval since tags are easier, at least in theory, for patrons to use as many already possess a level of familiarity with how to use them. Peters and Stock (2010) wrote on the exploitation of "power" tags (i.e. popular terms assigned by users) and suggested ways to identify them and use them to enhance document retrieval in library catalogues.

2.5.2 Disadvantages for libraries

On the negative side of tagging for libraries, Kim and Choi (2010) reported that the results of tagging do not support discovery of tagging data. Notess (2006) and Thomas et al. (2010, p. 231) have argued that a tagging system will always include messy tags due to the lack of any authority control, which is the very nature of tagging. Thomas et al. (2010, p. 225) have also proposed that libraries should first become aware of how "messy" tags can be before allowing their use in their catalogues. Mendes et al.'s (2009) study pointed out a low usage of the LibraryThing service in libraries, i.e., to implement LibraryThing tags, recommendation and links to other document editions.

West (2007) and Lu et al. (2010) underlined the negatives that tags carry due to their nature as a descendant of natural indexing languages; they are imprecise semantically, ambiguous because of the polysemy and synonymy of words and they lack hierarchy. Suchanek et al. (2008, p. 232) pointed out that tags assigned by users for personal

purposes are among the most frequent, which may cause a significant amount of "information noise"; a drawback that prevents tagging from being formally recognized as a library catalogue tool. Spiteri (2010) argued the same disadvantages for tags, while she added that few popular topics and tags will govern the tag cloud (p. 95), thus lessening its effectiveness. Peterson (2009, p. 56) pointed out that users may assign a tag as a subject descriptor even if the subject at hand is discussed only within a few sentences.

Guy and Tonkin (2006) suggested methods for improving the ability to create tags by educating users, setting up rules and agreeing on a set of standards to follow when creating tags, a rather ambitious goal that would deprive the whole notion of tagging's basic landmark: users are free to write what they like, as they like it, when they like it. Similarly, Jensen (2010) proposed that the tagging process could be improved if users are educated and instructed on how to become more effective when using this particular service.

2.6 Hybrid document indexing

A subject that has been widely discussed over the decades regarding the necessity of natural or controlled indexing languages in document indexing is that a combination of both is probably the most effective way for users to retrieve documents and experience a successful searching process. The debate on the use of tags in library catalogues also includes a relative argument; the implementation of a hybrid system that utilizes the professionalism and expertise of librarians with the raw power of the masses to describe the content of the documents and the resources that a library has to offer. It is likely that the combination of controlled (e.g. LCSH) and natural indexing

languages (e.g. tags) presents itself as a good option for library OPACs (Rowley, 1994; Gross and Taylor, 2005) to provide an effective context for document and information retrieval by prospective users.

Anfinnsen et al. (2011) implied that librarians should upgrade users to contributors in document description and exploit their possible expertise in specific subject areas, allowing them to connect keywords and tags to a multitude of topics. Lu et al. (2010, p. 766) concluded that the different nature of the tagging process is the key to contributing to the retrieval process in library catalogues. They also pointed out that users and experts could agree on some terms to be used in resource description. In addition, they found that both tags and subject headings can assist with users' searches (p. 776). This is a conclusion also reached by Caudle and Schmitz (2009) in their study. They pointed out that tags amplify the effectiveness of LCSH and they support the notion of a combined application of controlled indexing languages with the folksonomy created by users to attain a richer metadata environment (p. 431).

Eckert et al. (2009, p. 568) found that the combination of professional subject indexing, automatic indexing and tagging provides a suitable environment for users to search and retrieve documents. They noted, however, that the quality of work that the specialist librarian brings to the whole process of subject description cannot be replaced by automatic indexing or user-assigned tags. Lawson (2009, p. 580) reached a similar conclusion while researching WordCat: there are specific documents and topics that user-assigned tags can improve access to and enhance the effectiveness of library catalogues. Steele (2009, p. 77) concluded, after studying LibraryThing and the University of Pennsylvania’s PennTags, that professional methods provided by ex-

perts should be combined with new approaches in document description, such as tagging, in order to provide better access to information.

2.7 Case studies and library-related research

The literature on the use of tags by libraries does not provide much evidence from libraries that have utilized a tagging system and published the findings and results of their efforts. The literature is particularly lacking evidence of user participation in related efforts, such as how many users contributed to the creation of one or more tags in a single library catalogue? How many library records have been assigned with tags by users? How often, during a search session, do registered users assign tags and do they log in to describe documents with tags? How many tags do records have on average? Do users ask for assistance with tag content? On the contrary, there are enough arguments to reach an understanding of how tags may or may not contribute to the effectiveness of online library catalogues.

McFadden and Venker (2010) reported on the implementation of tagging systems in four different libraries: Ball State University, the Universities of Michigan and Pennsylvania and the Ann Arbor District Library. According to their study, the Universities of Michigan and Pennsylvania utilized the tagging system more as a tool that allows library users to organize information for personal use, while the Ann Arbor District Library is as an example of a library that has implemented tags at a higher level – any user can assign tags which will be displayed in the OPAC. It is also among the few libraries that have the option for "tag" search in the drop-down menu.

Peterson (2009) described the efforts of Montana State University with their newly, at that time, Electronic Theses and Dissertations (ETD) database, to promote user tagging on submitted papers. Two years after they launched the project, they experienced a low but increasing participation on behalf of the users. User-tagged documents increased from 2% to 8% of the overall electronic collection with a small overlap in assigned descriptors between LCSH and user tags (p. 56).

Mendes et al. (2009) presented the service called LibraryThing for Libraries (LTFL) discussing how it could be implemented in an academic library, while analyzing its potential as a document discovery tool in the catalogue. Anfinnsen et al (2011, p. 69) implemented a prototype tagging system at Brunel University Library and found there is a demand for such a system.

Thomas et al. (2010) studied the tags from ten books in LibraryThing in order to find tag characteristics that would impede the search and retrieve process in library catalogues. They found that the most common problem with tags is their variations (e.g. plural or singular form), followed by tags that do not contain any alphabetic characters (p. 233). In addition, Steele (2009, p. 70) examined the tagging systems of LibraryThing and the University of Pennsylvania's PennTags and suggested that libraries should follow the popular trend of today's successful web services that allows users to participate and interact online.

Library of Congress has been participating in the tagging of collections through its "Library of Congress Photos on Flickr" project since 2008. The photos, freely available through the Flickr web platform, provide users with the opportunity to assign tags

to the photographs at will, which then relates to the three tags that each photograph was assigned when first uploaded by the Library of Congress creating a cloud of available tags, both expert and user-assigned.

Lawson (2009) compared the LCSH of 31 books from OCLC's WorldCat to the tags assigned for the same titles by users in LibraryThing and Amazon (www.amazon.com). She categorized tags as "objective," which refers to tags that describe the content of the book and "subjective," which refers to tags that do not describe the content of the book but rather are used for personal (subjective) purposes by the user who assigned them. She also categorized the subjective tags into 12 categories: Reading Status (TBR, to be read), Date (Nov. 2007), Initials of tagger, Type (Fiction), Gift suggestion (Books for my daughter), Format (Kindle), Referral (Book Fair 2007), Location (School copy), Bibliographic (7-day loan), Opinion (Hilarious), Author (Female author) and Publisher (McGraw-Hill). She found that 51% of tags can be categorized as objective and 49% as subjective and concluded that there are some specific topics whose tags can amplify the effectiveness of the catalogue and provide a more comprehensive access to documents and information (pp. 577-8).

Suchanek et al. (2008) examined tags from Delicious and other web services and found that the semantic noise, as reported above, that exists within the tags tends to be reduced, as more meaningful tags emerge when users assign more tags to the same resource. They also found that popular tags are the ones that are most likely to contain useful terms that can assist in the retrieval process (p. 232).

Golub et al. (2009) studied methods to improve tagging when suggestions from controlled vocabularies are attached to the folksonomy dataset. They examined the web site Intute, which includes tags from readers and the repository Science and Technology Facilities Council, which includes tags assigned by the authors of the submitted papers. In both cases they found that users may use the suggestions made by controlled vocabularies (Dewey Decimal Classification and ACM Computing Classification Scheme, respectively), while they make little use of the tag cloud in order to choose which tags to assign.

3. Conclusions

The purpose of this paper is to provide evidence regarding the use of tagging systems in libraries based on a literature review. Although there is no hard evidence regarding the implementation of tagging systems in library catalogues per se, there are many documents that provide a solid background on the potentials and drawbacks of tagging for libraries, in general. The library community should, in order to find its steps into the future, follow closely the trails of the past. Document subject description, an area of expertise and the crown jewel of librarianship, should be the first area of services to distinguish the subtle differences between what is old but still very necessary and what is old and should be abandoned.

Quintarelli (2005) pointed out the relation that folksonomies have to a particular system, a characteristic that makes folksonomy interoperability among systems a difficult undertaking. This should also be taken into account by librarians who would like to implement tags via an external aggregation source, such as LibraryThing. Another element of tags in catalogues is that even though users and experts describe docu-

ments and sources using different types of descriptors, most of the time they have a common understanding of the content of those resources and documents (Rolla 2009, p. 179). Therefore, social tagging may provide a way of contributing to traditional methods of organizing documents (Ding et al., 2009, p. 2400).

In addition, Furner (2007) suggested that the systems created for tags in libraries should not only try to facilitate users, thus making the system popular, but should also try to maintain a level of quality based on the perceptions and skills of those who create the system in the first place. After all, tagging systems should not only be perceived as the threshold of user participation in subject indexing but should, at the same time, be considered a quality product that should perform at the highest possible level for many years to come. Users may also contribute to the design of tagging systems (Ding et al., 2009, p. 2400) although designers should carefully examine their suggestions.

Another aspect of tagging that librarians should consider is that taggers (i.e. library patrons) are assigning tags first and foremost for themselves (Caudle and Schmitz, 2009, p. 422). Even if that is a common ground of user assigned tag efforts, they enhance subject access to library collections; however, they cannot replace the invaluable parameters that control vocabularies provide to a system of organized knowledge (Rolla, 2009, p. 182).

Skeptics acknowledge the importance of technology and the effect that popular trends might have on traditional tools and services, but they nevertheless dismiss the instinctive reaction to all that it is new and appealing. Novel ideas, new approaches and al-

ternative methods to achieve a goal may encourage change and diversity, but those should come only if those changes are informed by what is already in place (Schwartz, 2008, p. 838).

Mann (2008, p. 89) went one step further to state that technology should be only one of the working parameters that sets the professional agenda and not the dominant factor that not only affects everything else but may set the agenda itself. He suggested that all professionals, especially the younger ones, should aim to achieve higher goals than the "one search box that includes and searches everything," stating that cataloging principles are the foundation of the profession. According to Mann, there is a fundamental mistake that undermines the profession; there are many individuals who cannot unravel principles from technology.

4. Discussion

According to Steele (2009, p. 79) the key to making tagging work for a local library catalog is participation. But perhaps there is a misunderstood concept here, probably triggered by the immense popularity of social media and services like YouTube (www.youtube.com). Libraries are nothing like the aforementioned service in terms of popularity and will never be – as they were never before in the decades before the dawn of the World Wide Web. Thus, the key to making tags work for libraries is not participation, since libraries will not experience the level of participation that other web services have, but user willingness, which translates to the will of the few to devote some of their time to the online activities that a library offers.

In addition, research and debate on the use of tag systems by libraries should not only focus on determining the quality of user-tags compared to subject headings assigned by professional indexers but also on discovering the quantity of generated tags by users now that several libraries offer them an experience that they seem so fond of and familiar with in their online activities. In order, however, to successfully determine and discover these elements, there are several questions that a librarian should try to find answers to when he or she evaluates any tag system: Did the tag system manage to transfer that feeling of "importance" in creating online content and describing resources to its users – a feeling that it is so widespread in the Web today and its popular social media web sites? Are library users infused with the willingness to provide keywords to enhance searching capabilities for other users? Is the effort of tag assignment to document records based on a real-time need to augment the search capabilities of OPACs? Will a library user participate effectively and contribute substantially to the search/research option of other users with the use of tags? And how likely is it that the subsequent user will benefit from the keywords chosen by the one before him? Furthermore, should a librarian aim to create and maintain an online library catalogue that will look like and offer the services as popular commercial websites such as Amazon, Google and Netflix (www.netflix.com) as suggested, for example, by Matheson and Davidson (2007, p. 69): a single search bar visible as the first option for search/research, user reviews, recommender systems, user evaluated content using a stars system and, of course, user created content in the form of tags? Those questions are important to consider when demonstrating and arguing the necessity of adapting the present system of document description to new approaches.

Another concept that has been reported as a contributing factor to making tags work is user motivation (Bischoff et al., 2008). The notion that users must be motivated in order to feel that participating in the online efforts of libraries (should those be a Facebook page, a web blog, a YouTube channel or, regarding the subject at hand, the assignment of tags) is important should be reassessed based on today's reality. And the reality dictates that librarians realize that social media web sites are experiencing a tremendous popularity and success; the motivation is there and web users are motivated in their own way, for their own purposes, under their own agenda.

Libraries, on the other hand, are a very different online breed; one that should not lead to misleading perceptions and expectations. Library users will most likely never become too motivated or interested in participating in the process of document subject description, even if librarians educate them, upgrade them to peers or impart their knowledge to them. It would, probably, make more sense to expect that tagging systems in libraries will provide some tags for a limited number of documents (e.g. popular fiction books) and will, most likely, never become an every daily activity for the majority of users. Which should then lead to another question, regardless of the one that refers to the necessity, the importance and the contribution of tagging systems in libraries' daily operations: should libraries be interested in incorporating a tagging system for their online catalogues? More evidence is needed.

Tagging systems should be one of the subjects that theorists and practitioners, sitting around a table, should honestly discuss, evaluating what their efforts have accomplished. In theory, users could adequately provide subject terms for documents; not as well or as effective as professionals, but their contributions would be welcomed.

Some have suggested and still do that users could become peers who create online communities of common interest that would assist libraries with their, no doubt, tedious work of describing the subjects of millions of documents. But the library community should find out how many libraries have succeeded in that goal.

It is likely that tags could, in one way or another, become an assistive technology that could help libraries improve their catalogues' function. This, however, is only one side of the coin. The other one, the most important and difficult one, is how to encourage users to participate. Considering the nature and scope of libraries and by extension the nature and the goals of their users, it may not be very likely that libraries find many who will be willing to assign tags to library records. Tagging photographs and songs is quite different from assigning content descriptors within a highly professional environment that cherishes the process of subject assignment as one of the most important elements of its existence.

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