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The Public Library Catalogue as a Social Space: A Case Study of Social Discovery Systems in Two Canadian Public Libraries

Abstract: This paper examines how library users access, use, and interact with two social discovery systems used in two Canadian public library systems. How do public library users interact with social discovery systems? How does usage between the two social discovery systems compare? Daily transaction logs of the social discovery systems used by the two libraries were compiled from May-August, 2010. Fifty sets of bibliographic records were compared to evaluate user-contributed content. Results indicate that features that allow for user-generated content are underused in both systems. Future research will thus focus on clients' motivations for engaging with the social features of social discovery systems, and their perceptions of, and satisfaction with, the benefits of these features.

1. Introduction

The public library catalogue has long acted as an important and fundamental medium between users and their information needs. The traditional goals and objectives of the library catalogue are to enable users to search a library's collection to find items pertaining to specific titles, authors, or subjects. Today's library catalogues are competing against powerful alternatives for information discovery. If the public library catalogue is to continue to be relevant to its users, it needs to move beyond its current inventory model, where all content is designed and controlled by library staff, and client interaction with catalogue content is limited, to a social discovery system, where users can contribute to, and interact with information and with each other (Calhoun 2006; Fast & Campbell 2004; Furner 2007; Spiteri 2009). The social discovery system can offer several benefits to public library patrons:

- Users can establish a social space where they share and discuss common reading, listening, and viewing interests;
- Users without easy access to a library branch (e.g., due to illness, limitations to physical mobility, lack of local branch, etc.) can connect to other members of the library and library staff via the catalogue;
- Users can provide a grassroots, democratic readers' advisory service, whereby they make recommendations for future reading, for example, based upon shared interests;
- Users can classify items in the catalogue with their own terms (or tags), which may be more reflective of their language and needs than the formal subject headings that are traditionally assigned by library staff.

Although social discovery systems have been used by commercial services such as Amazon for several years, their use in public libraries in Canada has not been examined in much detail. More importantly, the actual value of enhanced features that allow for user-contributed metadata - e.g., the addition of tags, reviews, and ratings - to the end user has not been examined: Why would users post tags, ratings, and reviews in a public library catalogue? These systems are costly to implement and to maintain: If we provide users with the ability to contribute content to catalogue records, will they actually do so? The goal of this paper is to examine and compare how library

users access, use, and interact with two social discovery systems used in two Canadian public library systems. Transaction log analysis (TLA) is used to answer the following research questions:

- How do public library users interact with social discovery systems? Specifically, which enhanced catalogue features do they use, e.g., faceted navigation, user-contributed content such as tagging, reviews, and ratings, and with which frequency?
- How does usage between the two social discovery systems compare? Specifically, are there commonalities or differences between how public library users use the enhanced catalogue features of the two social discovery systems?

Findings from this research can inform the design and implementation of social discovery systems that transform the public library catalogue from a static inventory to a social space where people can interact with collections and each other as they would in a physical library. How should such systems be designed to encourage user contribution and participation; how can we make these systems intuitive and reflective of community needs?

2. Context

Public libraries, which once had a near-monopoly as information providers, face increasing competition from online information providers who, with deeper pockets than most public libraries, can create discovery systems with the latest technologies to provide quick access to information. “The venerable library catalog ...suffers badly in comparison with its new online competitors. Users find the catalog hard to use, with its arcane search techniques, unintuitive subject headings, and relevance ranking that is rudimentary or nonexistent (Lehman & Nikkel 2008, p. 3). Calhoun argues that in the face of “flashy and powerful alternatives for information discovery, rapid changes in information technology, rising expectations of library patrons, a rapid increase in new kinds of digital assets, [and] mass digitization projects ...library leaders must move swiftly to establish the catalog within the framework of online information discovery systems of all kinds” (Calhoun 2006, p. 7). Jonathan Furner (2007) suggests that user-contributed content in a library catalogue can serve to:

- Engender a sense of community amongst library users in separate and remote locations;
- Allow library users to identify other individuals with whom they share interests;
- Engender a sense of empowerment among library users who may not otherwise participate in, or contribute to, library activities; and
- Allow library users to determine which kinds of resources and/or topics are currently popular, newsworthy, or receiving attention.

In the past few years, library discovery systems have made important strides in providing an enhanced search and discovery experience for users. These new discovery systems contain such features as predictive searching (or, “Did you mean?”), user-contributed content such as tags, reviews, and ratings, faceted navigation of results, and RSS feeds of stored searches, results, new postings, and so forth. The adoption of these new social discovery systems among public libraries in both the U.S. and Canada is still in the early stages. Spiteri (2007) analyzed the structure of tags from three popular social networking sites and compared them to Library of Congress Subject Headings (LCSH) and concluded that user-contributed tags could a) serve as a very powerful and flexible tool for increasing the user-friendliness and interactivity of public library catalogues, b) enhance or supplement existing LCSH headings assigned to library

resources, and c) be useful also for encouraging other activities, such as informal online communities of readers and user-driven readers' advisory services. In her analysis of the bibliographic content and social features of 16 popular social cataloguing sites (e.g., LibraryThing, <http://www.librarything.com>), Spiteri (2009) found that although the bibliographic content of the catalogue records of many of these sites was poor in comparison to that found in professional library catalogues, the social and interactive content of the records help create a vibrant and dynamic community of users who actively share their reading interests. Spiteri concluded that public library catalogues could profit greatly by incorporating a number of the social features found in these cataloguing sites, namely:

- User-posted reviews or ratings. These features may serve also as useful means by which users can communicate and share their reading interests and insights in a manner that may appear to be less intimidating, and perhaps more honest, than opinions provided by experts or professional reviewers;
- User-created and moderated discussion boards that focus on topics, individual titles, and so forth; and
- Client-posted tags. The inclusion of tags may serve as a useful means to allow clients with shared reading interests to access each other's relevant tags, and hence any resources that have been bookmarked under these tags. Librarians and library staff could use the information found under the public tags to help them create reading lists and to inform their collection policies.

Of potential concern is the dearth of comprehensive usability studies of these new social discovery systems. While one may certainly agree that these new discovery systems can contribute greatly, in theory, to the search and discovery experiences of public library users, it is another matter entirely to demonstrate clearly the reality of these benefits without conducting such usability studies. Most recent usability studies have focused on either the more traditional online catalogue, where most content is controlled by library staff, or on library web portals. Antell & Huang (2008), for example, investigated the subject cataloguing behaviour of undergraduate students at the University of Oklahoma libraries, where they analyzed the catalogue's transaction log and conducted a series of observation interviews with 20 students to measure user satisfaction. Results indicate that users rarely utilize correct and complete subject terms and that they are generally unaware of the many tools and services that librarians have created to assist them with subject searching. Cockrell and Jayne (2002) conducted a usability study of Western Michigan University's catalogue by having 50 users complete assigned searches for periodical articles. The variables measured include task success and choice of index and citation. The study revealed that users often do not understand clearly the specialized terminology created by librarians that is used in the catalogue. Antelman, Lynema, and Pace (2006) conducted a usability study of the Endeca social discovery system used by the North Carolina State University library. Two months' worth of transaction log analysis was conducted, as well as usability studies involving ten students, who were asked to complete ten tasks. The variables measured included task success, duration, and difficulty; the authors decided to not measure user satisfaction because they suggest that satisfaction does not correlate with success. The authors found significant use of such features as "more titles like this," the sorting of results based upon their popularity, automatic spell correction, and faceted navigation. Users indicated that they found Endeca easier to use than the regular Web-based university library catalogue and that they retrieved more relevant results with Endeca.

Battleson, Booth, and Weintrop (2001) conducted usability studies of the library web site of the University of Buffalo. Eleven participants were asked to complete a set of tasks in order to determine whether the web site was easy to learn, easy to remember, pleasant to use, and caused few errors. Results indicated a number of problems with the existing design of the web site; for example starting points for searches and help links could not be easily identified. George (2005) conducted a usability study of the Carnegie Mellon University library web site in which nine participants were asked to complete a set of tasks. Variables measured included the functionality, usability, strengths, and weaknesses of the site. The study revealed several key weaknesses with respect to navigation, screen design and labelling. McGillis and Toms (2001) conducted a usability study of Memorial University's library web site by asking thirty-three participants to complete three tasks. Variables measured included task success, system efficiency, and user satisfaction. The authors concluded that users experienced difficulties in knowing where to start and with interpreting the categories and labels used in the web site. Brantley, Armstrong, and Lewis (2006) conducted a usability test of the My Chicago Library portal, in which they measured the time and actions taken by eight participants to complete nineteen selected tasks. The variables measured included the time and actions taken to complete the tasks. The results of the test indicated that users often experienced difficulty customizing the portal and especially with understanding librarian-defined categories and terminology.

Most extant usability studies provide important insight into how people interact with online catalogues and how these experiences can be improved; what becomes evident from these studies is that catalogues should reflect the information needs and terminology of users, rather than library staff. With one exception, these usability studies focus on only the traditional model of the catalogue or library web site, where content is controlled by library staff. Only Antelman, Lynema, and Pace (2006) have conducted a comprehensive usability study of a social discovery system; while this study certainly provides useful information about how users interact with such a system, it is limited in that it does not address what is potentially the most important aspect of a usability study, namely, users' satisfaction with the discovery system. The results of this study may have limited application to public libraries, since the target audience of undergraduate students may not reflect the population of a public library. Our proposed project is thus an important contribution to understanding the impacts of social discovery systems within the context of a public library.

3. Methodology

The social discovery systems provided by AquaBrowser and BiblioCommons were examined. The target population of the study are library users in the Halifax (HPL) and Edmonton (EPL) public libraries. Daily transaction logs of the social discovery systems used by the two libraries were compiled from May-August, 2010. A transaction log is an electronic record of interactions that have occurred between a system and users that allows researchers to observe and analyze user behaviours (Jansen, Taksa & Spink 2009). Transaction log analysis (TLA) is a way of collecting data unobtrusively without directly interfacing with the catalogue users and that allows researchers to observe and analyze user behaviours. TLA can provide useful information about how the features of a system are used and can inform decisions about how these features can be improved. Focus was placed on examining data pertaining to features that are unique to social discovery systems, such as advanced faceted navigation and user-contributed (or social) features.

Measures logged and examined from both discovery systems included:

- Use of search refine features (i.e., faceted navigation)
- Use of tagging features
- Use of posted reviews
- Use of ratings features

It should be noted that a limitation of TLA is that it indicates only how a system is used, but provides no insight into the reasons for this use. As will be discussed later in this paper, an important next stage in this research plan is to examine people's reasons or motivations for using the social features of these discovery systems. In order to obtain a more detailed snapshot of how users contribute metadata to bibliographic records, a set of 50 monograph records was examined (weekly) in both systems to track changes to tags, reviews, and ratings assigned by the clients. Records were chosen initially from the library-generated reading lists posted in HPL (e.g., latest adult fiction); the final selection was based on the availability of corresponding records in EPL. The records were divided as follows:

- 10 Adult fiction
- 10 Adult non-fiction
- 10 Children's fiction
- 10 Children's non-fiction
- 10 Graphic novels

4. Environmental context

Halifax Public Libraries (HPL) serves 372,858 residents in the Halifax Regional Municipality in Nova Scotia, Canada. HPL comprises 14 branch libraries, a mobile library, a website, and Books-by-Mail and Home Delivery services (Halifax Public Libraries, *About*, 2011). Edmonton Public Library (EPL) serves 730,372 residents in the city of Edmonton, Alberta, Canada and comprises 17 branch libraries (Edmonton Public Library, 2011). The AquaBrowser social discovery system is owned by Serials Solutions (<http://www.serialssolutions.com/aquabrowser-my-discoveries/>) and provides a wide-range of features, such as relevance ranking, faceted navigation, "did you mean" corrected spelling feature, and social features that allow user-contributed metadata; in the case of HPL, these are the ability to add tags, reviews, and ratings to individual bibliographic records. The official website of the BiblioCommons social discovery system (<http://www.bibliocommons.com>) provides no information about the system; rather, it consists of a series of quotations from some of its clients. BiblioCommons is a Canadian system that also provides a wide range of features, including faceted navigation, relevance ranking, and social features, such as the ability to add tags, reviews, and ratings, to individual bibliographic records, as well as the creation of user-defined lists (<http://odyssey2007.wordpress.com/2007/04/21/beth-jefferson-on-the-bibliocommons/>). Further discussion of the specific features offered by the two social discovery systems will be provided in the findings section of this paper.

5. Findings

Since the data acquired via TLA differed from both social discovery systems, it is not always possible to draw exact comparisons or parallels between the systems. The approach taken is to examine the findings from each system in specific categories and to discuss patterns across the two systems whenever possible. It should be assumed that any references to features displayed

by AquaBrowser and BiblioCommons refer to what is available in HPL and EPL respectively.

5.1 Faceted navigation

Faceted navigation allows clients to filter their search results by various values, or filters. AquaBrowser provides a wide range of facets by which to filter results: Format; Author/Performer; Topic; Person; Place; Time Period; Genre; User Tags; Series; Reading Level; Target Audience; Language; Subtitles; and Date.

As is indicated in Figure 1, Format is the facet used most predominantly to refine search results (65%). It should be noted that not all facets are included in Figure 1 to accommodate easier formatting. The only social feature that appears as a facet is user tags, which is used infrequently (1.10%). It may be useful to add User ratings as a facet, since this would allow clients to refine their searches to, for example, DVDs that have been given a four-star rating. Since the log analysis data from BiblioCommons did not measure faceted navigation, observations will be limited only to the faceted options available in the system. BiblioCommons provides many facets by which to refine search results, namely: Format; Availability; Audience; Acquired; Topic; Content; Form/Genre; Language; Published date; Region; Author; Tag – Genre; e.g., costume drama); Tag – tone (e.g., moody); and Tag – theme (e.g., Nottingham). When clients assign tags to a bibliographic record, they are encouraged to place them into one of the following categories: Genre, tone, theme, and personal, which are reflected also in the three tag facets. Organizing facets in this manner can certainly help provide more precise and relevant search results. It would be helpful, for the sake of clarity and consistency, if the tags that appear in the bibliographic records were displayed in these same categories.

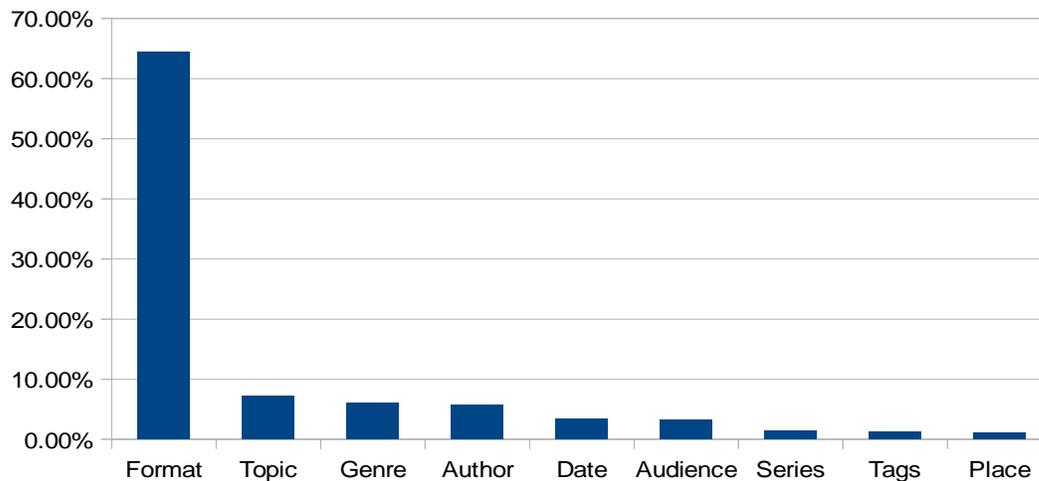


Figure 1: AquaBrowser Refine Search Feature

5.2 User-generated content

The transaction logs from AquaBrowser do not, unfortunately, record user-generated metadata. AquaBrowser allows clients to add tags, a star-rating, or review to any bibliographic record, and to save the record to a user-defined list: Adding user-contributed content may not be very evident in this system. There is no section of the bibliographic record that is devoted exclusively to user-generated content, which may make it difficult to distinguish between library- and user-

generated content. This means that for a number of records accessed, we saw no place or labels for user-generated content, which means that it was not obvious that such content could be contributed. The only clue lies in the “add a tag feature;” it is only then that the option is shown to add also a star rating and a review. If you do not make it obvious that you can add tags, reviews, or ratings as separate entities, it is likely that people will miss the latter two options.

The observation of the 50 bibliographic records suggests that very little use was made of the social features during our four months of observation. Only 6 records (12%) were assigned user tags: One record was assigned 2 tags, while the other 5 were each assigned one tag. There was no tag growth over the four months; in the case of the record with 2 tags, they were both assigned at the same time with no further additions. In the case of the two tags, it was impossible to tell whether they were assigned by the same person, since tags are not associated with any user names. None of the records was assigned a star rating or a review. BiblioCommons provides a variety of social features for the client, namely, the ability to add tags, star reviews, and comments (or reviews), and to save the record to a user-defined list. The “Add more” feature provides further options for user-contributed metadata, namely:

- **Content notices**, which enable you to flag titles that may contain coarse language, violence or sexual content. Advisories you contribute will be viewable by other library members.
- **Private notes**, which allow you to add a private note to any title in your collection. Private notes are not visible to other library members or staff.
- **Quotations**, which allow you to provide quotations from the item itself. Contributed quotations will be visible to other library members when they look at an item’s detailed record.
- **Similar titles**, allows you to recommend other titles that have something in common to the record being viewed.
- **Summaries**, which allow you to provide a summary of the contents of the item (versus a “comment,” which is a review of this content).
- **Video**, which allows you to add a video to an item in your collection to help other patrons determine if they would like to borrow it.
- **Age suitability**, which allows you to suggest for which age groups the item may be suitable

BiblioCommons engages clients in two other ways. At the bottom of each record is a reporting mechanism, which allows users to report any offensive user-contributed metadata; if three such reports are made for any one instance that content is removed. Second, every time clients contribute content, they receive community credits, by which prizes may be won. Clients may also send messages to one another via an internal messaging system.

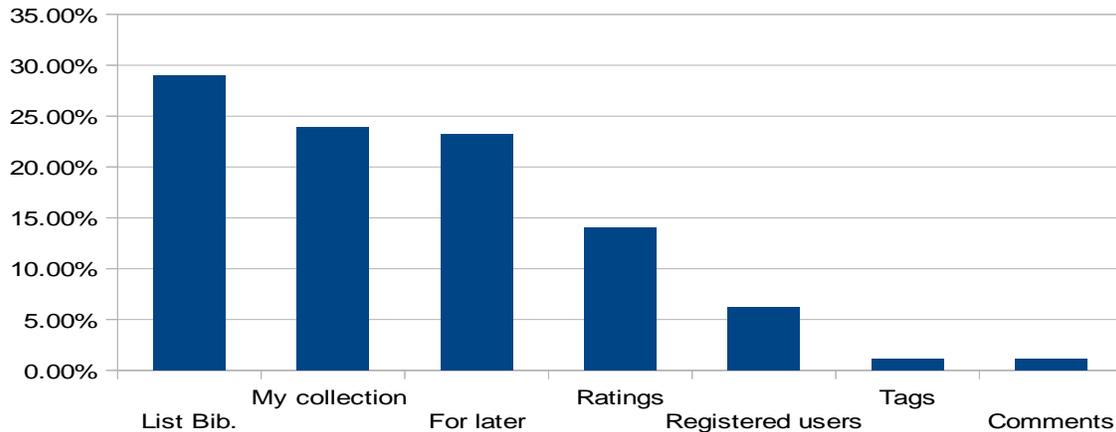


Figure 2: BiblioCommons User-Generated Content

Figure 2 indicates that lists dominate user-contributed content, namely List bibliographies (29%), My collection bibliographies (23.29%); and For later list (23.22%). These features allow clients to add items to pre-existing lists created by others, or to their own lists. Ratings constitute 14.07% of user-contributed content, while tags and comments only 1.12% and 1.09% respectively. The other social features are not used significantly enough to be included in Figure 5. Registered users (6.24%) likely refers to the rights page that people can access when they log in to add content; it's not clear how or why this constitutes an element of user-contributed content. The results of the observation of the 50 records supports further the finding that social features, with the exception of bibliographies and ratings, are not being used significantly in BiblioCommons. Tags were assigned to only 3 records (6%) and Comments to only 10 records (20%); the Ratings feature, however, was assigned to 32 records (72%). There was no growth in the number of tags or ratings assigned to any one record over the four months. It is difficult to track the rate of growth of ratings, since we could observe only the rating (e.g., 4 stars), not the total number of ratings assigned to any one record.

6. Discussion

The four months' worth of data acquired provides a snapshot of the use of the features that allow for user-generated content; the data are not completely comprehensive, as it is limited by the log data that is gathered by the two social discovery systems that was made available to us. Both systems provide a range of features that allow clients to add content to bibliographic records; while this range does differ between the two systems, features held in common are user tags, user ratings, and user reviews or comments. In addition to the many additional social features by which it allows clients to interact with the bibliographic records, BiblioCommons gives clients the opportunity to interact with each other via an internal messaging system; this feature is of particular importance, since it opens up the possibility of changing the role of the catalogue from an inventory of holdings, to a social network of clients and library staff.

The data examined suggest that the two systems could provide more options by which user-generated content can be accessed and searched. BiblioCommons provides a searchable tag field in the search box; this is not the case with AquaBrowser. Since neither system provides a tag

cloud, it is important that provision be made for searching by tag. A suggestion is that AquaBrowser incorporate a tag search field; one can search by individual tag once you come across them in individual bibliographic records, but this should not be the only way to incorporate tags in the initial search. The faceted navigation options provided by both systems allow you to filter your search results by tag; as has been shown, however, although both systems allow for an impressive range of facets, BiblioCommons incorporates more of its social features as facets in the form of different types of tags (e.g., affective, genre, etc.). Neither system allows you to filter your search by rating; this facet would allow people to decide, for example, that for any given topic, they want to retrieve only results that have a stated minimum user rating.

When it comes to the use of social features within bibliographic records, the data suggest that many of these features are considerably underused. This observation is limited, of course, when it comes to AquaBrowser, since it relies only on the tracking of the 50 records, rather than the log analysis. Both EPL and HPL records suggest that the tagging and review features are underused in both systems. It is possible for both library systems to import tags and reviews from external sources such as Amazon and LibraryThing; while this approach would certainly increase user-generated content in records, it should be approached with some caution. Content that is generated by local users may reflect better the local community that is served by the social discovery system. Let us say, for example, that the social discovery system allows the creation tags in different languages; this means that members of various cultural groups within the community may have the opportunity to add tags in their own language. In a pluralistic society such as Canada, where cultural diversity is celebrated, it is very important to encourage inclusiveness in user-generated content. Imported tags, on the other hand, may reflect biases and language use that is not reflective of the local community, e.g., primarily American usage. Another point to consider is whether importing content may actually dissuade local clients from adding their own content to records. If, say local clients comes across records that are already populated by imported tags or reviews, how likely are they to add their own content?

User-generated lists are clearly a very popular option in BiblioCommons; you can create customized lists in AquaBrowser, but their use could not be measured. While technically, lists do not constitute user-generated metadata, in that no content is added to bibliographic records – unlike tags, reviews, or ratings – their popularity certainly gives us pause for thought. While lists are a very useful way to allow individual clients to manage what they wish to see, watch, or listen to, their relevance could be increased by making them available publicly. So, rather than being the only person who can see my lists, I can choose to make any of my lists available for public viewing, which is an option made available by BiblioCommons. This feature mimics popular list-sharing sites such as Delicious or LibraryThing; in many ways, such lists can serve as grassroots, informal readers' advisory services. If, for example, in my result list for police procedural mysteries, I come across the lists of other clients who enjoy this genre, I can explore their lists to find other items of potential interest to me. Furthermore, library staff could use public client lists to keep track of reading, viewing, or listening interests, as well as to generate their own readers' advisory lists.

7. Conclusion

The results of our analysis suggest that clients of both Edmonton and Halifax public libraries are making limited use of the social features of the system that allow them to interact with the

catalogue records and with one another. While BiblioCommons, in particular, shows promising results with respect to user-generated lists (e.g., I own this) and ratings, many of the social features are noticeably underused. Log analysis shows us patterns of use; it says nothing, however, about why people use these features, or choose not to. Is the ease with which these features are displayed or promoted a factor? In the case of AquaBrowser, as we have seen, it is not immediately clear that you can add reviews or ratings to a record; on the other hand, BiblioCommons shows clearly the social features available, so presentation may not be a significant factor. Incorporating tag clouds and providing an easier way to search for tags at the “entry” stage of the search, rather than at the refine stage, may be another way to engage clients more fully with user-generated metadata.

An important question to consider is the extent to which people are motivated to add tags, reviews, or ratings to an item *after* they have read, seen, or listened to it. Certainly sites like LibraryThing and Amazon are successful in generating user-generated metadata, but to what extent is this success related to the fact that in most cases, people are adding metadata to items they own? The film site IMDB, on the other hand, often generates pages of user-written reviews for films or television series that people have watched; ownership of these items does not appear to be a significant factor. If these sites are successful in generating user-created metadata, why is this not the case for the two systems examined? Is it because people are so used to library catalogues whose content has always been controlled completely by library staff that they are afraid of adding their own content to bibliographic records? Since the implementation and maintenance of social discovery systems is costly, it is important for library management to make informed decisions about which system features are the most cost effective and how these features may be better tailored to meet user needs. A noticeable limitation of transaction log analysis is that it does not tell us why clients use these features and, perhaps more importantly, why they do not. Future research will thus focus on clients' motivations for engaging with the social features of social discovery systems, and their perceptions of, and satisfaction with, the benefits of these features.

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