New generation of catalogues for the new generation of users: a comparison of six library catalogues

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Abstract

Purpose: The purpose of this article is to describe some of the problems and issues faced by online library catalogues. It aims to establish how libraries have undertaken the mission of developing the next generation catalogues and how they compare to new tools such as Amazon.

Methodology/Approach: An expert study was carried out in January 2008 to evaluate six library catalogues (one traditional and five recently modernised) and compare them to Amazon.

Findings: While the traditional catalogue has stayed far behind, the modernised catalogues have taken two different approaches in becoming the ‘next generation catalogue’. Two catalogues focused on improving functionality while two others decided to introduce Web/Library 2.0 trends first. At this point, none of the catalogues offers as vast a range of features as Amazon does, but one catalogue managed to surpass Amazon in some of the examined features.

Research limitations/implications: The chosen set of tested catalogues may not be representative and we cannot draw conclusions for the whole population of library catalogues.

Originality/value: The paper shows the current state of library catalogues and draws attention to some important issues concerning Web 2.0 trends. Features presented in the tabular outline can be used as pointers for further development of library catalogues.

Keywords: Library catalogues, Information retrieval, Web 2.0, User participation, Users, Amazon

Paper type: Research paper

1. Introduction

A global discussion on the new generation of the web and the next generation of users has made libraries take a good look at their services and how they fit into the rapidly developing environment. By not following technological innovations and the trends on the web, libraries will not be able to compete with services such as Amazon or Google and may lose their position as primary information providers (Coyle and Hillmann, 2007; Sadeh, 2007). Even though users still recognise the quality of library services, they routinely bypass catalogues in favour of other discovery tools (Calhoun, 2006; OCLC, 2005).

But problems for the online catalogue did not start with the advent and development of the web. Reports on catalogue’s poor functionality and difficult use can be traced continuously for more than 20 years (for example Markey, 1984; Borgman, 1986; 1996; University of California Libraries; 2005 and a number of librarians’ as well as users’ blogs). Through time, the catalogue did change, but most of the modifications were made on the surface and not in the core functionality that would truly affect the user experience (Borgman, 1996; Tennant, 2005).
Awakened by the Web 2.0 discussions, librarians have started to implement features to improve the basic functionality of the catalogues and adapt to the new trends. Libraries are now faced with some features that challenge the traditional frame of mind and need to decide what the next generation library catalogue is going to look like. The paper looks at how library catalogues have tackled the mission of becoming the 'next generation catalogue' and how the improved catalogues measure up against Amazon, which is perceived both as competitor and a model of an innovative tool.

2. The library catalogue through time

The library catalogue should enable end users to search and find materials/resources without the help of a librarian (Hildreth, 1982). But for a long time online library catalogues did not meet these expectations and were criticised for being more difficult to use and less serviceable than the traditional card catalogues (Borgman, 1996). Already in the early years of online catalogues, researchers (such as Hildreth, Borgman, Bates and others) examined catalogues’ weaknesses and suggested what could be done to make them better. The results of their studies indicated that the construction and the design of the online catalogue had not been done with sufficient understanding of the end-users’ searching behaviour, and this made the catalogues suitable for the well-qualified librarians but not the unskilled users.

After the rigid first-generation catalogues (that in many ways resembled the card catalogue), the second generation started to appear in the mid-80s (Hildreth, 1995). The development of information technologies enabled more sophisticated systems but, despite the enormous progress made in comparison to the first generation, library users still experienced difficulties using the catalogue (Hildreth, 1995; Borgman, 1996). To get the results, the user needed to understand the information retrieval process, how to construct queries and how to use the system. Researchers found subject searching and Boolean operators to be the most problematic areas. The catalogue did not, for example, provide online thesaurus aids or alternative formulations of the search statement to help the users translate their queries to the controlled vocabulary terms used by the library. In addition to that, Boolean logic in query formulation was hard for the user to comprehend and the queries themselves were best only when searching for known items. Nevertheless, despite some problematic areas in catalogues which resulted in poorer search success, library catalogues were quite popular among users (Large and Beheshti, 1997; Markey, 2007), who in general expressed enthusiasm and satisfaction with the use and the performance of these retrieval systems (Hildreth, 1995).

In 1988, Hildreth outlined his vision of the third generation catalogues, especially the functional improvements that would make the catalogue more user-friendly, such as natural-language searching, browsing, ranked result sets, expanded coverage and scope, relevance feedback methods (“more like this”, “not interested”), user-popularity tracking, and different aids (spelling corrections, synonyms, automatic term conversion). But except for some prototypes, the third generation catalogues as described by Hildreth (1988; 1995) did not appear for more than a decade. Researchers (Hildreth, 1995; Borgman, 1996; Large and Beheshti, 1997; Antelman, Lynema and Pace, 2006) one by one reported that library catalogues still offered mostly only second generation functionality and that the changes had been made merely on surface and not in the core functionality where they were most needed. Interestingly, Hildreth’s list of required functions has stayed relevant till this day and his prediction has only been confirmed by a number of studies in the following years (Yu and
Young, 2004; Antelman, Lynema and Pace, 2006) that also examined what features library catalogues should adopt.

While library users were still quite satisfied with the online catalogues in the early 1990s, things began to change with the advent, development, and spread of the web. It offered users easier and quicker ways of finding information, even if users were novices and did not have good searching skills nor the knowledge how the system worked. Services on the web became more and more sophisticated with search engines and sites incorporating new features, many of which Hildreth and other researchers had declared missing in the library catalogues.

Changes on the web influenced users’ mental models, their expectations, behaviour and strategies when using online library catalogues that had, by then, also been available on the web (Yu and Young, 2004; Novotny, 2004). Due to the common practice on the web, users got accustomed to natural-language searching and typing multiple search terms (keywords) on a single line without connecting them with Boolean operators. They started to expect library catalogues to function as internet search engines or online bookstores, interpreting broad keyword searches they entered and sorting results according to relevance (Novotny, 2004). This has caused a declining percentage of correct syntax and an increasing percentage of keyword searches with zero results in library catalogues (Blecic et al., 1998). Finding library catalogues hard to use, unintuitive and ineffective in comparison to search engines and other popular sites, library users chose to look for information elsewhere and the catalogue ceased to be the most important retrieval system (Fast and Campbell, 2004). But it is somewhat encouraging that, even though users preferred to use the web over the library catalogue and still do so, studies have continuously proven that users still see the catalogue as a trustworthy, well-organised and impressive tool (Fast and Campbell, 2004; OCLC, 2005; Paw, 2007).

In the last couple of years, library catalogues have been faced with yet another trend that has influenced users’ expectations and the way they use the web: that is the advent of Web 2.0. The web has become a place of collaboration and participation where users no longer only receive but also create and share content. Web 2.0 principles have made trendy web services even more attractive for users and put libraries in the position where they need to reconsider their services and role in the information environment, governed by new generations of library users. Only by identifying and understanding the needs and behaviours of end-users can libraries develop better user-centred catalogues.

3. New library users - customers

Influenced by the surrounding technology, today’s library users have developed different information skills and needs than previous generations. They are web-savvy and can no longer be seen just as patrons, but also as customers and consumers: being aware of alternatives in information provision, they are behaving as customers and taking an active role in choosing their information provider (Žumer, 2007).

In the last few years, a lot of attention has been dedicated to younger generations of users, who are or will become any library’s most important customers. They visit the library more than any other age group (Pew Internet and American Life Project, 2007) and at the same time indicate the characteristics of future generations of users. Generations born roughly between 1980 and 2000 have been given many names, Millennial generation, Generation Y, and the
Net generation being the most popular ones. Prensky (2001) described these generations of users as ‘digital natives’. Growing up with computers, video games, the web and other technology, these generations are native speakers of the digital language. As a result, Millennials think, process, and manage information differently from their predecessors, all leading to changed (and higher) needs and expectations. As customers, they:

- expect and want more personalisation and instant gratification;
- are collaborative and multitask;
- learn experimentally through trial and error rather than by formal learning or reading;
- prefer non-linear access to information;
- respond better to graphic than text;
- expect highly intuitive interfaces and convenience (Prensky, 2001; Sweeney, 2005; Breeding, 2006).

In all the emphasis given on younger generations of users, we must not forget that also older generations of users have been influenced by the changes in the information world (University College London CIBER Group, 2008). Many so called ‘digital immigrants’ are quickly catching up with the digital native generation in becoming web-savvy users with high expectations.

Knowing this has forced librarians to rethink and redesign their services and technologies, because even though library resources are considered more trustworthy and credible, users are attracted to the ease of use, convenience, and online availability provided by other freely accessible web services (Sadeh, 2007). To cross the divide, libraries need to bring convenience, trends and quality closer together.

4. Improving the library catalogue

Even though research and discussions on the weaknesses of library catalogues and the possibilities to improve them can be traced continuously for almost 30 years, it is interesting that it was the Web 2.0 movement that really shook the ground and set in motion a number of changes. It caused a new powerful wave of broad self-examination of library technologies that once more led to the dissatisfaction with online catalogues (Breeding, 2007a). Compared to other web destinations, many library interfaces fall short of current search technologies, visual appeal, usability, and user engagement. Fifarek (2007) reflects on the topic with an observation that “the online catalog looks positively prehistoric in comparison to the exciting things that appear daily on the web”. Realising that the library could compete with other information creators only by better reflecting the expectations of web-savvy users has triggered a progress in creating the ‘next generation library catalogue’. As a result, a number of projects and products emerged, trying to make up for lost time and adapt to the new environment and demands (Breeding, 2007a).

Reading the visions of what the ‘next gen catalogue’ is supposed to look like (Markey, 2007; Breeding, 2007b; Pattern, 2007), there seems to be a common consensus in the library community that promotes improving the core functionality of the catalogue and as well as introducing the some Web 2.0 trends. Although the ideas are sometimes described as a novelty, many of the concepts had been presented in the library world before they even started to appear on the web. In accordance with the observed user behaviour in first and second generation library catalogues, researchers (e.g. Borgman, Hildreth and others) gave suggestions on how to improve basic functionality and even proposed some Web 2.0-like
features. Hildreth (1995), for example, proposed ranking by circulation or popularity. Unfortunately many of their ideas have not been implemented and have, somewhat ironically, later appeared on popular web sites (Yu and Young, 2004).

4.1 Improving functionality

The design of the library catalogue needs to follow the actual information seeking behaviour of users that has been strongly influenced by the web. Searching, presentation and navigation of results are the most problematic areas. To improve these areas, the catalogue should offer an always-present simple keyword search box and enhanced browsing possibilities. In case of failed searches, the system should help the user by providing possible search queries and spelling corrections. Results ranked by relevance, clustered and enabling faceted navigation would allow the user to drill quickly through the results and recognise the most relevant titles. Serendipity, federated search, recommendations on related materials, and enriched content are also features that could all add additional value to the catalogue.

4.2 Implementing Web 2.0 trends

Web 2.0 thinking and technologies have influenced libraries and library services, where the application of Web 2.0 principles has been widely framed as ‘Library 2.0’ (Maness, 2006). Web 2.0 encourages users’ creativity and sharing but at the same time supports and emphasises the role of personalisation and individualism (Web 2.0, 2007; Abram, 2005). All these qualities could also be included in the library catalogue to make it more interactive and interesting and to gather additional data that could also support the functionality of the catalogue.

Personalisation techniques help a system adapt to the needs and preferences of an individual based on his/her user profile. With large amounts of information available, users today expect personalisation and other techniques to filter and organise most relevant data. Library catalogues can take the first step towards personalisation by building user profiles where users subscribe to notifications of their choice and keep track of saved searches, interesting items or the content they contributed to the catalogue. By tracking a user’s activities, the catalogue could also personalise pages and recommendations to suit the needs of each individual. Going even further, user profiles could also be employed to enable users to discover people with similar interests and research their information space.

The most recognisable Web 2.0 trend is the collaboration of users in the creation of content on the web. Wenzler (2007) argues that traditional library catalogues lack mechanisms for collecting knowledge of library users. So far the catalogues relied on the expertise of a small group of specialists, but the development of internet technologies has uncovered new ways to allow libraries make use of collective intelligence. User ratings, reviews, comments, tags and lists all present a way for libraries to engage their users, take advantage of their contributions and generate additional metadata to enrich the catalogue. By doing this, the catalogue can become better and its value enhanced as it can, for example, point users to recommended titles based on the reading habits and descriptions of other users (Wenzler, 2007). But as great as the potential of user contributions sounds, there are some issues librarians need to deliberate.
4.3 Harnessing collective intelligence in the library catalogue

The problem with collective intelligence is that it is achieved only when a critical mass of participation is reached. Only with a sufficient number of people using the service does the service reach its potential and really becomes valuable (Anderson, 2007). Wenzler (2007), however, claims that library communities are too small to achieve critical mass and that so far social features have added only little value to the library catalogue. Besides rather small communities, there are also other issues, which may have an impact on user participation. Libraries are ‘late-comers’ in the area of user-generated content and people have already accepted Amazon, LibraryThing (http://www.librarything.com) and other popular sites as primary resources for amateur content. Another question is also the motivation of users to participate actively in the library catalogue. Are library users prepared to altruistically help the library to enhance its catalogue or will they participate only when they can also fulfil their private incentive (like keeping track of the books they have read)? Gatenby (2006) believes that user contribution will not happen automatically and that library needs to make sure that contributing is attractive and easy. Libraries should, for example, woo users with appealing sites, intriguing challenges, acknowledgements and work flows designed to fit their habits.

Some insight into the presented issues can be found in the OCLC’s report on sharing, privacy and trust in the networked world (OCLC, 2007). Results of the survey show that the vast majority of people would not be very likely to contribute content, self-publish, or join discussion groups if the library offered these services. In general less than 10% of the public has indicated they would be either extremely or very likely to participate. The number does not get much higher even among students, the representatives of the new generations of library users, from which one would expect a higher level of interest and inclination towards sharing and collaborating.

5. Research

To see how different catalogues had tackled the mission of becoming the ‘next generation catalogue’, an expert study was carried out in January 2008, based on the framework from a study performed in July 2007 (Merčun, 2007). For the purpose of the expert study, six library catalogues were chosen:

- one traditional: the Slovene union catalogue COBISS (http://www.cobiss.si)
- five more modern and innovative ones:
  - Ann Arbor District Library catalogue (http://www.aadl.org/catalog),
  - Hennepin County Library catalogue (https://catalog.hclib.org),
  - Queens Library catalogue (http://www.queenslibrary.org/),
  - Phoenix Public Library catalogue (http://www.phoenixpubliclibrary.org/),
  - WorldCat (http://www.worldcat.org).

The sample was chosen based on an overview of a larger number of online catalogues which revealed that traditional library catalogues are quite alike while more current catalogues differ greatly in new features they had adopted. That is why only one traditional catalogue was chosen and five modern ones, each of the five set up by a different vendor or developer: Ann Arbor catalogue was modernized by John Blyberg. Hennepin library uses SirsiDynix software but also does some modifications and developments by itself, Queens library has embedded Aquabrowser, Phoenix library works with Endeca software and WorldCat is developed by OCLC. We have decided to select public library catalogues, WorldCat and COBISS as they...
all serve a broad and diverse group of end-users, which has enabled a better and more reliable comparison. The sample of the examined catalogues is small and the results therefore cannot be extrapolated to the whole population of library catalogues. However, by choosing catalogues developed by different companies or individuals, the results can show various trends and approaches to developing the next generation catalogues.

As library catalogues are constantly measured up against popular websites and search engines, the study also included Amazon, the online bookstore. Amazon features have often been mentioned as the model for what the library catalogue should look like by both librarians and users (e.g. Coffman, 1999; Yu and Young, 2004; Žumer, 2007). The study therefore not only looked at the differences between catalogues but also how their services compare to those offered by Amazon, taking into account that the latter is not a catalogue per se.

Following the examined literature on improving catalogue’s functionality and designing the next generation library catalogues, we formed a list of examined features and grouped the features into six categories. The catalogues and Amazon were carefully examined for each of the six areas and analysis was presented in descriptive as well as tabular form. For the purpose of a tabular outline, the authors used the following indicators to describe the presence and realisation of the features:

- ++ (very good),
- + (good, with some limitations),
- +/- (present, but very limited), and
- – (not present).

### 5.1. Library catalogues compared

#### 5.1.1. Search and presentation of results

Any user’s searching process depends largely on the information retrieval system itself, as some systems are more in tune with searching behaviour than others. Queens and Phoenix library catalogues have easier and more intuitive search and presentation of results than the other examined catalogues. They have achieved that by presenting a simple keyword search box on all library pages, ranking the results by relevance, and enabling clustering and faceted navigation to refine the query and manage large result sets. Phoenix library (as seen in Figure 1) catalogue made the functionality even better by providing automatic spelling corrections, rich possibilities to start search by browsing and a very sophisticated breadcrumbs navigation that also helps modify the search.
Figure 1. Results of a search on Phoenix Public Library catalogue where the search term ‘nitting’ has been automatically corrected to ‘knitting’.

Testing the other catalogues showed that WorldCat was slowly following Queens and Phoenix catalogues by applying some of the more important features (relevance, clustering) while Ann Arbor, Hennepin and COBISS catalogues had not made much progress in that area. Their query interfaces are more complicated than it is usual in the web environment.
today and search in all three catalogues requires more steps than necessary, which makes the search slower and more frustrating.

COBISS catalogue for example displays results in form of a list (as seen in Figure 2) where many times the user cannot even see the full title or all the authors. The list can only be sorted by title, year, and author and there are no possibilities for additional refinements or quicker browsing. As the list is not ranked by relevance, the user has to go through the whole list, clicking on each result to see the basic bibliographic data. To improve the search, the user needs to start from the beginning.

Figure 2. Results of a search on ‘knitting’ in COBISS catalogue

Also Hennepin and Ann Arbor library catalogues do not offer relevance ranking or clustering to help users browse through the results quicker. Both catalogues’ result lists display more information about the title than the previously presented COBISS catalogue, but that is only the case when users search by keyword. Whenever they search by something other than that (for example title, subject, or author), they are offered an abbreviated list (as shown in Figure 3) that is not really very informative or useful in comparison to the otherwise available result lists (an example of a full data results display in Hennepin catalogue can be seen in Figure 8).
Figure 3. In Ann Arbor catalogue an abbreviated results list appears when the user searches by title, subject, or author.

<table>
<thead>
<tr>
<th>Num</th>
<th>Save</th>
<th>TITLES (1-12 of 54)</th>
<th>Year</th>
<th>Entries Found</th>
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<td>1</td>
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<td>Knitting</td>
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<td>2</td>
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<td>Knitting : 13 Easy Designs For City Girls With Style : Chadwick, Alice, 746.432 Ch</td>
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<td>5</td>
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<td>Knitting America : A Glorious Heritage From Warm Socks To High Art : Strawn, Susan, 746.432 Sl</td>
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<td>7</td>
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<td>8</td>
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<td>Knitting And Crocheting Illustrated : Breton, Barbara, 746.43 Br</td>
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<td>9</td>
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<td>The Knitting Answer Book : Raddiffe, Margaret, 746.432 Ra</td>
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<td>10</td>
<td></td>
<td>Knitting Around The World From Threads : 746.432 Kn</td>
<td>c1993</td>
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</table>

None of the two libraries has really integrated the catalogue into their web site (as we have seen in the cases of Phoenix and Queens) and offered users a permanent quick search box to start the search from any location on the site. Users therefore need to find the “catalogue” button to enter it and only then can they begin with the search.

5.1.2. Content

Reviewing the additional content provided by the libraries we see that, except for WorldCat and COBISS, library catalogues have done quite well enriching the plain bibliographic information with covers, reviews, summaries, excerpts, and tables of content they bought from commercial vendors or imported from Amazon (such as is the case in the Phoenix catalogue).

Three catalogues have also added some multimedia, but so far only in the form of downloadable samples of e-media (as seen in Figure 4 for Hennepin County Library).
Figure 4. In Hennepin County Library catalogue the user can directly download the file or listen/see the samples from the results list.

Only in Hennepin library have they also added a number of annotations from librarians in form of a streaming audio (as seen in Figure 5).

Figure 5. Library recommendations list with audio reviews (Hennepin County Library).

As a discovery tool, libraries have also started to create various lists (new, popular, or recommended titles). Hennepin and Phoenix library have integrated them into the records, so that the record links the users to the list and therefore brings them titles they might also be interested in. Ann Arbor and Phoenix library (as seen in Figure 6) even created systems to display similar titles within the record in the form of “more like this” and “users who borrowed this item also borrowed…”. But especially in the case of Ann Arbor recommendations (“users who borrowed this item also borrowed…”) it seems that either the algorithms are not as successful or that there is a lack of critical mass, since often the recommended titles have very little in common.
5.1.3. Participation

Allowing users to take part and create content is another way of enriching the library catalogue and some libraries have already implemented tools to make user-generated content an integral part of the catalogue. Ann Arbor and Hennepin library catalogues have been among the first to adopt some of the social features that invite user participation.

Ann Arbor library offers user ratings, reviews, comments and even tags. It promotes user contributions by displaying recent and random reviews and tags, giving the library users an additional discovery channel. Ratings and tags are visible in the results list (as seen in Figure 7), but the downpoint is that the full text of reviews is not completely integrated into the records (as users click to read the reviews they are directed to a new site as seen in Figure 8).
Also Hennepin Library devoted its time to socially rich features, but so far they have not yet taken the full advantage of all the acquired data. The library set up a so-called ‘Booksplace’ where it gathers contents added by users and librarians. Users can create their own lists, comment on books and on what others have written, and search thematic lists created by librarians. Children and teenagers even have their own ‘spaces’ where they can not only review but also give ratings to library materials. All these things could really be a great
addition to the classical bibliographic data presented in the library catalogue, but so far not many possibilities have been put to use (see Figure 9).

Figure 9: Results list does not show whether users have commented on the books

A hint that there might be user comments present appears only in the full record, where a link directs the user away from the catalogue to Bookspace. Only there can the user read comments and see whether the title appears in any of the extensive library lists. Besides rather poor design, the catalogue is also missing on a great opportunity to include content that library users have already contributed to the website; the catalogue for example does not show in which user-generated lists the title appears, or what rating did kids or teens give to the book.

WorldCat does also not promote user-created content. Ratings are not visible on the results list but only inside ‘reviews’ tag, titles are not connected to user lists nor are the lists displayed for users to browse through them. Up until now only Phoenix catalogue completely integrated lists (user and library lists) into the catalogue. Links to the lists appear in the record display (see Figure 10) and users can even limit their search to shared lists. But so far user generated lists have been the only social feature in the Phoenix catalogue; instead of allowing users to contribute reviews and ratings, they decided to import Amazon’s user reviews.
It seems that libraries have not entirely decided how to handle user reviews. Ann Arbor library copied the most common practice on the web where a review is automatically added to the catalogue, but users have the possibility to evaluate the usefulness of the review and report any inappropriate content. Hennepin library took a different approach as librarians review all submitted comments for appropriate content.

Although the examined library catalogues have implemented only some user participation features, it is only the COBISS catalogue that does not offer any of the so far mentioned features.

5.1.4. Personalisation

The studied catalogues mostly include user account options (renewal, reservations, etc.) and e-notifications, enable saved searches and items, and some interface settings (language, library unit). Catalogues with more options for user participation are also the ones that automatically recognise the user and gather users created content in their profile (as seen in Figure 11). By doing so, they encourage users to participate as they can more easily contribute and create their own collection or personal library at the same time. The so called “My library” services in current catalogues do not yet have the sophisticated systems to offer personal recommendations based on observed and predictive information nor do they support building rich personal profiles that would help users connect with each other.
5.1.5. Other trends

To make use of the benefits offered by the new trends, libraries have also started embedding RSS feeds, blogs, downloadable e-media and instant messaging. Except for WorldCat and COBISS, libraries have responded quite well to these services. They use RSS feeds as an alternative to traditional e-notifications and blogs to communicate to, and with, users on a daily basis. But the biggest innovation is the downloadable e-media. Hennepin, Phoenix and Queens library have all included these records to the catalogue and offer the possibility to borrow e-books, music, movies, and audio books by downloading them from the library’s website. Three of the catalogues also offer instant messaging service where users can chat with a librarian, but so far none of them has implemented a chat box directly into the library catalogue. This has been a recent innovation in some library catalogues and it has several advantages. The users do not have to sign in and can start chatting the moment they have troubles finding something as the chat box (meebo-me) can be present on all catalogue’s pages.
5.2. Library catalogues vs. Amazon

Comparing library catalogues to Amazon (Table I and II) we see that none of the six chosen catalogues offers the complete package of examined options that Amazon does. Especially COBISS proved that traditional library catalogues really cannot compete with current services such as the ones offered by Amazon. But at the same time a comparison between COBISS and other, more modern catalogues, shows that the progress of library catalogues has really been substantial in the last few years. Even WorldCat, the catalogue with the worst ‘score’ among the next generation catalogues, is miles ahead of COBISS in terms of functionality.

<table>
<thead>
<tr>
<th>Table I: Features in Amazon and library catalogues compared - part 1</th>
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<td><strong>Amazon</strong></td>
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<td><strong>A</strong></td>
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<tr>
<td><strong>Search</strong></td>
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<td>Simple keyword search box on each page</td>
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<td>Spell checking</td>
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<td>Automatic spelling corrections</td>
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<td>Begin search by browsing</td>
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<td>Full text searching</td>
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<tr>
<td><strong>Results page and navigation</strong></td>
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<tr>
<td>Relevance ranking</td>
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<tr>
<td>Clustering and/or faceted navigation</td>
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<tr>
<td>Breadcrumbs navigation</td>
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<tr>
<td><strong>Enriched content and recommendation lists</strong></td>
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<td>Cover art images</td>
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<td>Reviews</td>
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<td>Summaries / Annotations</td>
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<td>Excerpts</td>
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<td>Tables of content</td>
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<td>&quot;More like this&quot;</td>
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<td>New items, most popular, recently returned items and recommendations lists</td>
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<td>Audio in video content</td>
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</table>

**Key:** A = Ann Arbor District Library; H = Hennepin County Library; Q = Queens Library; P = Phoenix Public Library; W = WorldCat; C = COBISS

++ very good; + good, with some limitations; +/- available, but very limited; – not available
Looking at the six areas of research, we see that library catalogues have, in general, made the best progress on the content field and the least in user participation and personalisation. Reviewing the results we also find that in each of the more modern catalogues a different set of features has been applied. In fact, we can recognise two quite distinct approaches to modernisation. On the one hand, there are Phoenix and Queens libraries that have both focused more on improving the functional features of their catalogues when, on the other hand, Ann Arbor and Hennepin libraries devoted more attention to Web 2.0 features. The catalogue, focusing on functional improvements, offer less user participation and personalisation while the catalogues with more enhanced Web 2.0 features have not modernised their searching and navigation. Using and testing all catalogues in the expert study we found that the latter are much more difficult to use and are not user friendly despite offering users participation. The new features in these catalogues are affected by poorly designed interfaces that can frustrate web-savvy users. On the other hand, catalogues that focused on modernising functional aspects are easy and fun to use with many options for discovery and serendipity. With a number of interesting and well-designed features that encourage users to research the catalogue, the lack of direct user participation and personalisation is not really problematic.
In comparison to library catalogues, Amazon’s greatest advantage is rich content. Not only does it offer full text searching and streaming multimedia samples, it also tries to make the best use of all available information. Based on the analysis of the books’ full text, user behaviour and user contributions, it recommends and links to similar books that may interest the user. User contributions form an important part of the additional content as user ratings, reviews, tags, lists, images, product information, and even discussions are all imbedded in the record display. Besides for the user participation, Amazon is also famous for its personalisation. It tracks user’s recent activities, offers the user to define the materials he/she already owns and the titles he/she is interested/not interested in. Based on that, it displays recently viewed items, gives personal recommendations, and informs the user of any new items that might suit.

These are all areas where library catalogues have not really caught up with Amazon. But in the study we assessed that there are some features where library catalogue interfaces have not only caught up but also surpassed Amazon. Phoenix library catalogue, for example, offers automatic spelling corrections and better options to refine the query by navigating through faceted navigation and breadcrumbs.

7. Conclusion

Although the analysis of the six catalogues cannot be extrapolated to the whole population of library catalogues, it does offer some insight into their current state. The analysis and reports in literature suggest that the widespread debate on improving the library catalogue is finally showing results. Functions of the third generation catalogue described two decades ago are now at last starting to take form in the so-called next generation catalogues. The ‘seek-first browse-later’ paradigm is slowly beginning to turn around in favour of simple query interfaces. The simpler the query interface, the more sophisticated the system needs to be to enrich the query with additional information (Sadah, 2008), and some catalogues have managed to do just that.

Losing users to competitive services like Amazon, libraries have become more aware of the needs of the world surrounding them and are trying to meet the new expectations and habits by making library catalogues more user-friendly, intuitive, and also visually attractive. They are taking different approaches to achieve that, but our expert study has shown that traditional library catalogues should first apply better searching and navigation systems, and only after the basic functionality of the catalogue is improved should they go to the next level and apply Web 2.0 tools. Even though applying Web 2.0 trends to library catalogues has often been recommended, this is not a comprehensive prescription for all that is wrong as many library catalogues still lack basic functionality (Breeding, 2006). It would therefore not be wise to limit the attention to Web 2.0 tools as there may be many other features from which catalogues could benefit. Libraries must also not forget to incorporate the many strong aspects of traditional online catalogues. Once more equal to other web services, these features will give the library catalogue an extra edge.

It cannot be expected that a simple and ideal solution will be found for all libraries (Žumer, 2007) or that all new features will remain an integral part of the library catalogue. Looking at the presented new features, it seems that social features have the most uncertain future. We need to wait and see how users are going to accept them. Will they even prove to be valuable or needed in the catalogue? The success depends on both parties involved: libraries need to
design social tools that are attractive, intuitive, and useful and users need to contribute and use the services provided by the catalogue.

Privacy and trust are another two issues libraries need to consider and decide upon. So far library catalogues have not introduced the personalisation features similar to the ones that can be found on Amazon, partly also because they still debate on whether tracking user actions would even be appropriate. What libraries really need to do now is to ask themselves what their role and the role of the library catalogue is in this information society and then plan their services accordingly. They need to decide what they want to achieve and evaluate their newly acquired features by carrying out user studies. It would be interesting to see how library users experience different library catalogues, which features they find most useful, or whether the new features have changed how they feel about the catalogue (or the library) and the way they use it.

While libraries will never have the economic power comparable to Amazon or Google, they still have an important role and should develop their services in line with new developments and user expectations. They should combine their traditional expertise with new trends and create better services to keep the current users and attract new ones. There may not be much time left for the necessary changes.

References (All URLs were checked March 6th 2008)


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