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An Investigation Into The Perceptions Of Academic Librarians And Students Towards Next-Generation Opacs And Their Features

Introduction

It has been suggested in the literature that the current generation of library customers favour using Internet search tools, predominantly Google, over library catalogues. This may be because users perceive these services to be more user-friendly, quicker and easily accessible (Lewis, 2008; Sadeh, 2008; Sadeh, 2007). Up until very recently, the OPAC (Online Public Access Catalogue) had remained largely unchanged since the 1980s and consequently it has lagged behind modern Internet search tools (Yang & Wagner, 2010; Emanuel, 2009; Antelman et al, 2006). Therefore, if libraries are to remain relevant, improved interfaces based on an understanding of user need will have to be developed. Relevant research should involve determining what features make Internet services successful and incorporating these into next-generation library catalogues (Craven et al, 2010; Lewis, 2008; Sadeh, 2007).

The literature based on user studies of next-generation OPAC features is limited, and predominantly originates from North American academic institutions. These studies have generally involved participants completing practical tasks to assess the usability of an interface product that a library has intended to purchase, implement or develop (Fagan, 2010). However, they provide inconsistent suggestions regarding the usefulness of particular features and the preferences of different user groups. It is also unclear how intuitive the catalogues are compared with Internet search tools (Allison, 2010; Yang & Wagner, 2010; Emanuel, 2009; Tam, et al, 2009; Tam, 2008). The overall aim of this article is to explore users' responses to next-generation OPAC searching, browsing and Web 2.0 features. Specifically, it will seek to determine whether or not the interface in use at the University of Sheffield is useful and intuitive to users who have different levels of searching ability, knowledge and experience of using information retrieval tools. It explores their views of faceted browsing, tagging,

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ratings and basket functions. In addition, it will investigate whether there is a difference between librarians' and students' perceptions towards the usefulness of specific features.

Throughout this article, the term "next-generation" is used to describe library catalogues that have been developed to meet user needs and move beyond earlier OPACs, which could be seen as primarily designed from the perspective of experienced librarians with a need to conduct "known-item" searches (Emanuel, 2009; Merčun & Žumer, 2008; Sadeh, 2007; Large & Beheshti, 1997). Next-generation catalogues are also referred to in the literature as "discovery layer interfaces" (Yang & Wagner, 2010:691). The development and definition of next-generation OPACs is discussed further in the literature review section of this article, as is the changing information seeking behaviour and expectations of library users. The literature review also summarises previous user studies of next-generation OPACs, which are organised under sub-headings that correspond to the features investigated in this study. The next section is the methodology which explains the design of this interview based research. The findings and discussion sections, which follow, set out the results of the study and then discuss how this compares to results of previous studies. Finally, the conclusion provides recommendations for further research and advice for libraries who are considering implementing a next-generation catalogue system.

Literature Review

Changing library user needs and expectations

According to Lewis (2008), there is much evidence to suggest that users favour Internet search engines over the library catalogue and other institutional resources. This may be because Internet search engines provide relevance-ranked results and have aesthetically pleasing interfaces (Lewis, 2008). They

also provide access to a variety of information resource types including websites, articles and online books. In contrast, the traditional library system requires the user to search through multiple databases and repositories to locate different materials (Sadeh, 2008). Furthermore, commercial sites like Amazon have raised user expectations regarding the amount and types of information required about a resource, such as customer reviews and ratings (Emanuel, 2009). Therefore, to remain relevant, library OPACs will increasingly need to imitate Internet services and enable users to quickly and easily locate scholarly information in an integrated environment (Allison, 2010; Yang & Wagner, 2010; Lewis, 2008; Sadeh, 2007).

Next-generation OPACs

In 2006, North Carolina State University in collaboration with a commercial company developed a new catalogue interface, which was customised to meet user needs (Emanuel, 2009; Sadeh, 2007). Commercial library suppliers and libraries have since produced similar systems, which have been referred to as "next-generation" catalogues and "discovery layer interfaces" (Yang & Wagner, 2010:691; Emanuel, 2009:118; Sadeh, 2008). Most of these systems are developed separately to, and overlaid on top of, the library's existing management systems and disparate collections, from which data can be harvested to create a unified searching index (Sadeh, 2008). As a result, next-generation interfaces enable the user to simultaneously search both the library's traditional holdings as well as online content licensed by the library. Increasingly, the discovery layer interface also allows article level searching, although this study was primarily focused on those next generation features that were designed to enhance the OPAC. Additionally, these catalogues incorporate relevancy ranking (Fagan, 2010; Yang & Wagner, 2010; Emanuel, 2009).

Next-generation catalogues differ to traditional OPACs in the sense that they enable "serendipitous," more exploratory discovery of information as opposed to a targeted search for known items and are therefore more user-friendly (Allison, 2010:382; Emanuel, 2009). Simple keyword searching is encouraged and the

user is not required to select limiters prior to their search (Yang & Wagner, 2010; Emanuel, 2009). Therefore, next-generation catalogues may be particularly useful to those users who are unaware of the availability of resources prior to their search or have limited search skills (Emanuel, 2009). The searching experience may be further enhanced with the inclusion of spell-checking, recommendation features and links to full-text resources (Allison, 2010; Yang & Wagner, 2010).

Another contrast with traditional OPACs is the next-generation catalogue's interface, which imitates Internet sites like Amazon by using book cover images, tag clouds and icons to emphasise key information. Furthermore, they typically include Web 2.0 features, such as tagging, reviews and RSS feeds, which are interactive and enable user contribution (Allison, 2010; Yang & Wagner, 2010; Emanuel, 2009; Sadeh, 2008). Yang & Wagner claim that such peer-generated information is now expected by library users (2010). Similarly, Sadeh (2008) believes that the success of Web 2.0 services on the Internet provides evidence that users appreciate being able to contribute their knowledge and learn from their peers.

Simple and advanced searching features including integrated content

Most next-generation catalogue interfaces provide as the default a simple keyword search box and a link to an advanced search option (Yang & Wagner, 2010; Emanuel, 2009). This is because users can generally comprehend "keyword" searching more than they understand, for example, ISBN searching (Emanuel, 2009:119). Indeed, it was discovered by a user study that was conducted at TUOS in 2008, that international students favour keyword searching because they are accustomed to using Google (Tam et al, 2009). Furthermore, the results of a Copac usability study suggest that the majority of users expect to find a simple search box on the home page of their OPAC (Craven et al, 2010). However, according to Yang and Wagner (2010), librarians

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have expressed negative opinions towards the keyword search box. They believe that it causes confusion to users and that a basic or advanced search option is more suited towards constructing precise search queries (Yang & Wagner, 2010).

There are few references within the literature regarding user perceptions towards integrated resources within OPACs. However, some academic libraries have stated that being able to provide integrated content helps to promote the smaller local electronic collections, which would not be retrieved by a commercial search engine (Allison, 2010; Lewis, 2008). Some findings suggest that users have a little difficulty fully understanding the context of the search, as well as there being difficulties integrating wider functions such as interlibrary loan (Majors 2012; Comeeaux 2012).

Faceted browsing

Faceted browsing provides the user with an overview of their search results via a list of categories or facets, from which they can select sub-facets to refine their results. These facets are derived from the item's metadata record and generally encompass categories such as author, subject and format (Emanuel, 2011; Fagan, 2010; Ho et al, 2009). According to Fagan (2010), faceted browsing is a common feature in next-generation library catalogues. It has also been investigated by a number of usability studies, which suggest that faceted browsing is a popular feature that users find quick to learn and easy to use (Denton & Coysh, 2011; Emanuel, 2011; Allison, 2010; Tam et al, 2009; Olson, 2007). In a usability study conducted by Ex Libris and The University of Minnesota on Primo, all 16 participants expressed the view that the faceted browser is a useful feature for refining their search results (Rosen, 2006, 2007 cited in Sadeh, 2008). Comeaux (2012) found that users found faceted browsing easy to learn. Furthermore, Emanuel (2009) has observed that faceted navigation is the feature that is most appreciated by users, particularly those who have limited searching skills.

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Some of the studies highlight comments made by users towards the categories and sub-categories employed for the faceted browsers, with opinions varying among the participants and the studies. In particular, it has been written that the terminology used for the facets can be ambiguous, with some categories within the same faceted browser being too similar (Denton & Coysh, 2011; Emanuel, 2011; Emanuel, 2009; Olson, 2007). Users also find it confusing when sub-facets are duplicated (Emanuel, 2011; Olson, 2007).

Tagging

Tagging allows users to attach keywords to item records, which may enhance personal retrieval and improve the browsing experience for other users, particularly when they are seeking items on specific topics according to popularity or currency (Anfinnsen et al, 2011; Sadeh, 2008). Indeed, Anfinnsen et al (2011) argue that the inclusion of tagging into OPACs may help libraries to overcome the limitations of rigid classification systems, by allowing users to supplement and enhance the existing metadata records. Such a system may be beneficial to those users who have difficulties generating search terms, because they can browse the tags added by other users (Anfinnsen et al, 2011).

Limited research has been conducted regarding the integration of tagging into academic library catalogues (Anfinnsen et al, 2011). However, the existing studies show that user opinion is diverse regarding the usefulness of this feature. For example, in a next-generation OPAC study conducted by Emanuel (2009), the majority of participants stated that tagging is useful although half of them were unaware of it prior to the study and they did not feel compelled to contribute tags. Indeed, anecdotal evidence gathered from a number of institutions has suggested that students are not interested in tagging (Ho et al, 2009). Furthermore, participants in a Copac development study expressed concern about how such a feature would be administrated (Craven et al, 2010). Similarly, in a user study conducted at Brunel University, some of the participants

expressed concerns about the relevancy of the tags added by other users (Anfinnsen et al, 2011).

The University of Nebraska-Lincoln Libraries have decided to integrate tagging into their Encore catalogue because they claim that the feature is popular and easy to manage. In particular, the University's librarians have added tags to improve the information contained in the item records. The academic staff have also used tags to organise and bring together information resources for their students (Allison, 2010).

Ratings and reviews

As with tagging, the literature shows that library users have varied opinions regarding the usefulness of user contributed ratings and reviews. Users in favour of the feature express the view that it can be helpful when deciding whether a resource is relevant to them (Emanuel, 2011; Tam et al, 2009). However, the studies also reveal that some users are concerned about the objectivity, quality and relevance of the information (Emanuel, 2011; Emanuel, 2009; Tam et al, 2009). In a 2008 study conducted at TUOS, almost half of the participants felt that user contributed ratings and reviews are too subjective. They also expressed doubt regarding the usefulness of the comments as students will be using the same books for different purposes (Tam et al, 2009). Similarly, in a 2009 VuFind user study the participants wanted to know the origin of the reviews and whether they were being moderated (Emanuel, 2011). Another issue, which was highlighted by a Copac usability study, is the volume of ratings and reviews available on library catalogues compared with commercial sites. Participants expressed the opinion that a link to Amazon would be more reliable and less subjective because their website has a larger audience (Craven et al, 2010). Participants in the Tam et al study (2009) also commented that they would not contribute reviews because it is too time consuming and they would prefer the reviews to be written by a librarian or an academic (Tam et al, 2009).

Basket or E-shelf functions

Next generation OPACs often have the function for the user to save material such as search results to a basket or e-shelf. For example, the e-shelf feature in Primo allows the user to save a list of item records. It also allows the user to: write notes; e-mail and print bibliographic details; save search queries; and push the information into reference management tools (Lewis, 2008). Instances of user studies investigating similar features are sparse in the literature. However, a feature that is similar to Primo's e-shelf is briefly mentioned in several studies by Emanuel, which tested the VuFind and WorldCatLocal catalogues, as well as a development study of Copac (Emanuel 2011; Craven et al, 2010; Emanuel, 2009). These studies found that the majority of users like the feature, although they expressed a desire to be able to create multiple lists and to organise the information into folders. Another VuFind user study, which was conducted at York University Libraries in Toronto, tested a "favourites system" to see whether users would notice and understand how to use the feature (Denton & Coysh, 2011:308). Most of the participants noticed the link and understood how to add items to their favourites list. However, several participants were confused by the terminology and thought that they were adding a bookmark in Internet Explorer (Denton & Coysh, 2011).

Visual appearance and accessibility

Next-generation catalogue interfaces are designed to be simple and easy to read, encompassing graphics, icons and cover images, which are sourced from other websites (Yang & Wagner, 2010; Emanuel, 2009).   There are few references within the literature regarding user perceptions of the visual appearance and accessibility of next-generation interfaces. However, in the Tam et al study (2009), the majority of the participants did not think that the inclusion of book cover images is useful although they thought that it made the catalogue "look attractive" and "easier to read" (Tam et al, 2009:20). Conversely, a Copac development study found that the inclusion of book cover images would help users to find particular items. However, its participants were reluctant to use

some of the features that were not self-explanatory or visible. Therefore, this study suggested the integration of pop-up windows to provide additional information about the features (Craven et al, 2010). In contrast, a 2009 usability study, which involved predominantly undergraduate students, found that the VuFind next-generation interface was "intuitive" and "user-friendly" (Denton & Coysh, 2011:317). Another user study of VuFind found that the participants appreciated the "clean" and "uncluttered" interface (Emanuel, 2011:50).

An overall impression towards next-generation catalogues

Overall, the existing studies indicate that users prefer next-generation catalogues to traditional OPACs because they are more user-friendly (Denton & Coysh, 2011; Emanuel, 2011; Emanuel, 2009). It is also apparent that users have a stronger preference towards the searching and browsing features than the Web 2.0 features, which have received a mixed reception (Emanuel, 2009; Tam et al, 2009). However, some of the literature also implies that academic staff and librarians may favour traditional library catalogues or at least have different preferences towards the next-generation features. This may be because they have advanced searching skills and thus do not fully utilise the browsing features (Allison, 2010; Yang & Wagner, 2010; Emanuel, 2009; Tam, 2008). Furthermore, it has been suggested that not all users understand how the next-generation features work and that these OPACs are more suited towards those who already have a basic understanding of library catalogues (Allison, 2010; Emanuel, 2009).

Methodology

Data collection method

This study takes an inductive approach as it investigates a case study and a topic, for which limited research has previously been conducted. While the study draws on the limited existing research and aims to address gaps within the

literature, it does not intend to test a specific theory. Rather, conclusions are drawn from an interpretive analysis of qualitative data, which has been collected specifically for this study using semi-structured one-to-one interviews (Hennink et al, 2011; Bryman, 2008). The interviews loosely followed an interview guide, the structure of which was adapted from an example guide obtained from Hennink et al (2011:114). It included a list of questions and topical probes, partly derived from the literature (Hennink et al, 2011) (See Appendix for questions). This data collection method was determined to be appropriate because it allows a degree of flexibility, whereby interviewees can raise issues not pre-determined in the interview schedule. For example, this can arise from the researcher asking additional, probing questions that are prompted by the participants' responses. This encourages the interviewees to talk about the research issues and topics that they perceive to be the most important or interesting from their perspective (Bryman, 2008). As a result, the interviewer may uncover new research issues or questions that are not apparent in the literature. Furthermore, the interviewees should be able to provide varied and detailed information (Hennink et al, 2011; Bryman, 2008).

Primo at the University of Sheffield

The interviews investigated user perceptions towards specific features of StarPlus, a next-generation catalogue that has been recently implemented by The University Of Sheffield (TUOS). At the time that this study was conducted, TUOS Library was offering users a "beta" version of their next-generation StarPlus catalogue alongside their second generation Star catalogue (TUOSL, 2012). StarPlus is a customisation of Primo, a proprietary next-generation discovery interface that was released in May 2007 by Ex Libris (Yang & Wagner, 2010; Sadeh, 2008; Sadeh, 2007). According to Sadeh (2008), Primo does not require users to have any prior training because it is "intuitive" and similar to web search engines (Sadeh, 2008:12). Furthermore, the results of two initial usability studies conducted by The University of Minnesota in collaboration with Ex Libris showed that academic staff and students found the Primo interface "easy to use"

and "easy to learn" (Rosen, 2006, 2007, cited in Sadeh, 2008:22). Other studies have concluded with broadly positive evaluations of Primo but users, but a few problems remain, including some that existed with prior systems and continue even with the improvements of next generation design (Comeaux, 2012; Majors, 2012).

Participants

Interviewees were recruited from three sub-groups from TUOS and included: seven librarians, six MA Librarianship students, and five international post-graduate students from various other disciplines. Although the numbers of interviewees is small, the purpose of the study was exploratory, seeking to identify patterns and relationships that would have a potential to be tested on a bigger population by survey. The intention behind the sampling of different user populations was to investigate whether or not there is any connection between a library user's background context and their preferences and perceptions towards next-generation catalogues. For example, it can be assumed from the literature that practicing librarians will have more advanced searching skills and experience of using library catalogues than students (Merčun & Žumer, 2008; Large & Beheshti, 1997). Conversely, the students may have a greater knowledge of Internet search tools and Web 2.0 applications (Yang & Wagner, 2010; Sadeh, 2008). It can also be surmised that the MA Librarianship students will be more perceptive towards library catalogue usability and design issues than other students.

Data collection process

To recruit librarians, the researcher distributed an invitation email to all TUOS Library staff via a general email list. A further nine emails were sent out to the researchers' personal colleagues, which helped to recruit five of the seven librarians interviewed for the study. The Librarianship students were made aware of the study through an advertisement which was placed on Facebook while the post-graduate students were approached directly in TUOS's St.

George's Library. The interviews that were conducted with the librarians and Librarianship students were identical and on average required around 30 to 45 minutes each to complete. They took place in a private room located in TUOS's Information Commons during July 2012. During the interviews, the participants were shown the StarPlus catalogue on the computer and were asked to give their opinions regarding the features demonstrated. The interviewees' were also given the freedom to explore the interface themselves as they were relatively unfamiliar with StarPlus prior to the interviews. The post-graduate student interviews followed a shortened version of the same interview guide. The majority of the interviews were audio-recorded and transcribed, although a small number were manually recorded using a guide sheet designed for this purpose.

Data Analysis

The themes of interest were identified from previous literature (as summarise above), eg user views on tagging or general responses to next generation interfaces. These themes were then used to guide searching the interview data to locate responses. The analysis was undertaken manually, searching the text for keywords and phrases related to each of the aspects of OPACs which were under investigation. On this basis the data was coded and themes in the detail developed. From the responses, a summary was written differentiating the views of librarians, library students and PGT students. Since the data was not gathered on the basis of any structured sampling approach, the numbers of times any particular response was received were not considered relevant, rather the text captures an overall sense of the different groups' responses. There were inevitably a few exceptions to the general view, and where those occurred, reference is made to those in the write up below.

Interview Findings

A total of 18 people took part in the study: seven librarians, six MA Librarianship students, and five international post-graduate students from a range of disciplines. Further details of each participant are given in Tables 1 to 3 below.

Table 1: University Of Sheffield Librarians					
ID	Gender	Sector	Full-time/ Part-time	Used Star/ StarPlus for own academic study?	
L1	M	Customer Services	Full-time	YES	
L2	F	Customer Services	Part-time	YES	
L3	F	Customer Services	Full-time	YES	
L4	F	Customer Services	Full-time	NO	
L5	F	Customer Services/ Cataloguing	Part-time	YES	
L6	M	Customer Services	Part-time	NO	
L7	M	Customer Services	Full-time	YES	

Table 2: MA Librarianship Students				
ID	Gender	Home/ International	Full-time/ Part-time	
LS1	F	Home	Part-time	
LS2	F	Home	Part-time	
LS3	F	Home	Part-time	
LS4	F	Home	Part-time	
LS5	F	Home	Full-time	
LS6	F	Home	Part-time	

Table 3: Post-Graduate Students (Short Interviews)						
ID	Gender	Programme of study	Home/ International	Nationality	Full-time/ Part-time	
S1	M	PhD Accounting	International	Saudi Arabian	Full-time	
S2	F	MA Public Health	International	Saudi Arabian	Full-time	
S3	M	MSc Mechanical Engineering	International	Malaysian	Full-time	
S4	M	MSc Materials Science and Engineering	International	Nigerian	Full-time	

S5	F	MA Translation Studies	International	Taiwanese	Full-time	

Interviewees' background knowledge and experience of using library catalogues and Internet search tools

All seven of the librarians and six Librarianship students had used TUOS Library's second generation Star catalogue, with five out of seven librarians stating that they were "very familiar" with it. The librarians used the old Star on a regular basis, particularly when answering customer enquiries, while the Librarianship students used Star less frequently to search for specific resources. When asked about their use of StarPlus, most of the librarians implied that they were less familiar with it than Star and therefore less inclined to use it:

> "Yeah I'm not so familiar with it but I have used it [StarPlus]…I suppose it's the habit really, I'm still in the habit of using straightforward Star." *(L1)*

One of the librarians said that using StarPlus placed them "outside of their comfort zone" while two others stated that using Star was a "force of habit". Similarly, all but one of the Librarianship students used Star more often than they used StarPlus. Regardless, most of the librarians and Librarianship students expressed frustration towards Star regarding its limited browsing capabilities. For example, they found it difficult to locate information resources unless they had entered specific item details. As a result, the librarians used Internet search tools to find bibliographic information, which they could then enter into Star. Additionally, three of the six Librarianship students interviewed favoured using Internet search tools, particularly Google Scholar and subject-specific databases, because they enable the user to narrow the results and define their search parameters more easily, as well as providing access to full-text journal articles.

The other post-graduate students were less familiar with Star, with only three out of the five interviewees having used it frequently. They were even less familiar

with StarPlus and, prior to their interviews, one of the students had not used it while another had never heard of it. The majority of the post-graduate students favoured using Internet search tools because they had a preference for e-journal articles and felt that there is a greater variety of information available through Google and Google Scholar. Like the librarians, they had developed a habit of using Google and Star in combination.

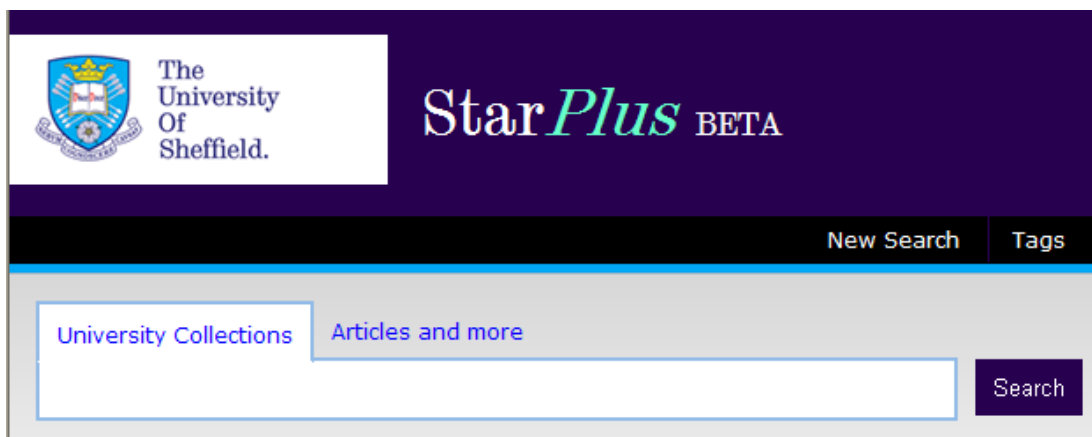***Simple and advanced searching features including integrated content***

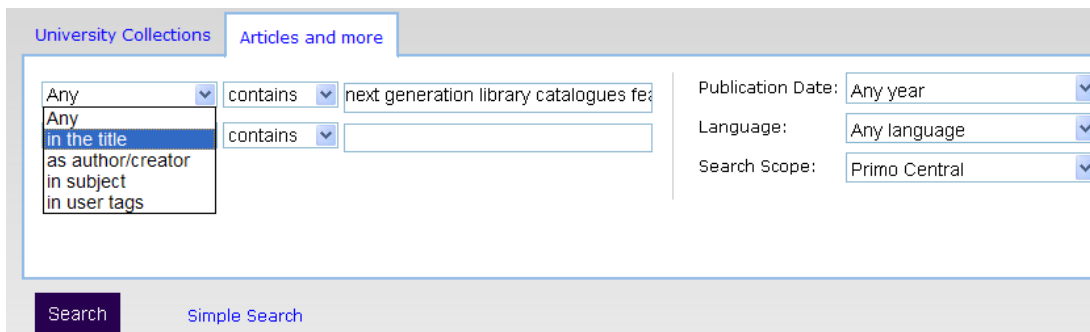*Figure 1: Example of StarPlus' keyword search box.*

Figure 2: Example of StarPlus' advanced search option.

StarPlus' keyword search box allows users to choose whether they want to search within the University collections or conduct article level searching across a number of remote electronic databases, with links provided to the full text where available. The majority of the librarians responded that the search box is

useful and will bring up the most relevant information first. One librarian also stated:

> "I think it's pretty useful [because] it's clear and it's kind of what people expect [because] people are used to Google and Amazon and eBay and they all work on a similar basis…" *(L7)*

Only two librarians were unsure about the usefulness of this feature, in both cases because they thought that users would be confused about the type of information that can be entered into the search box. With regards to the integrated content, most of the librarians and Librarianship students thought it would be easier, quicker and "less intimidating" than searching individual databases. However, it was commented that having to click on an additional "Articles and more" tab to search the databases is confusing.

The interviewees were also asked about how useful they think it is to have an advanced search option. Four librarians said that the advanced search feature is useful. They said that having a combination of both the simple and advanced search options caters for users with different searching needs. Indeed, the Librarianship students and post-graduate students gave varied opinions about StarPlus' search options, with most preferring one option over the other. However, two librarians stated that advanced search is unnecessary in a catalogue that facilitates faceted browsing.
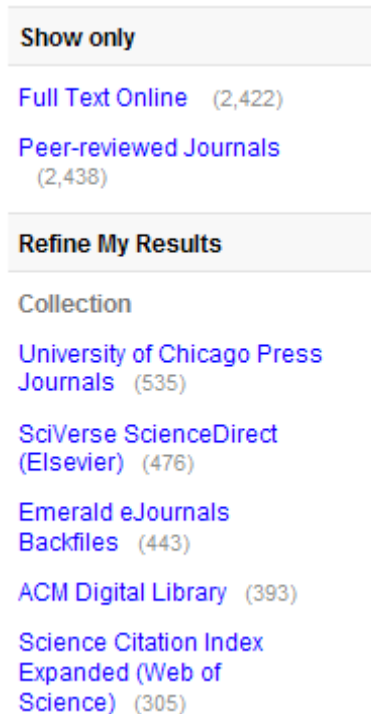
Faceted browsing

Figure 3: Example of StarPlus' faceted browser.

Most of the interviewees strongly agreed that StarPlus' faceted browser is useful, as it enables the user to refine their search results when browsing the catalogue using broad query terms. Nevertheless, the librarians and Librarianship students were somewhat critical towards particular aspects of StarPlus' faceted browser. For example, some of them commented that there are too many options, which causes facets to be hidden. Therefore, they recommended that the number of facets be reduced. While most were reluctant to suggest which facets should be removed, one of the Librarianship students felt that the "Collection" and "Subject" facets were too similar. Another felt that there is some duplication between the "Collection" and "Resource type" facets.

Tagging

StarPlus Tags

☐ My Tags Only

Most Recent Tags	
p2 (1)	07/07/12 01:46:55
p1 (1)	07/07/12 01:12:32
metal (1)	22/03/12 13:35:07
information (1)	02/03/12 11:35:11
business research skills (6)	16/01/12 13:48:53
guanxi (6)	16/01/12 13:38:39
contract law (1)	11/01/12 09:53:00
am issues (1)	10/01/12 15:48:27
work psychology (1)	10/01/12 15:48:27
acs (1)	10/01/12 15:47:22
culture shock (2)	07/12/11 15:04:43
business (2)	07/12/11 15:04:43
indonesia (1)	07/12/11 15:04:43
china (1)	07/12/11 15:03:46
metadata (3)	29/11/11 13:34:20
interoperable (2)	29/11/11 13:34:20
digital (2)	29/11/11 13:34:20
cloud (1)	29/11/11 13:32:59

Most Popular Tags   Cloud/List

acs am issues business business research skills china cloud contract law culture shock digital guanxi indonesia information interoperable metadata metal p1 p2 work psychology
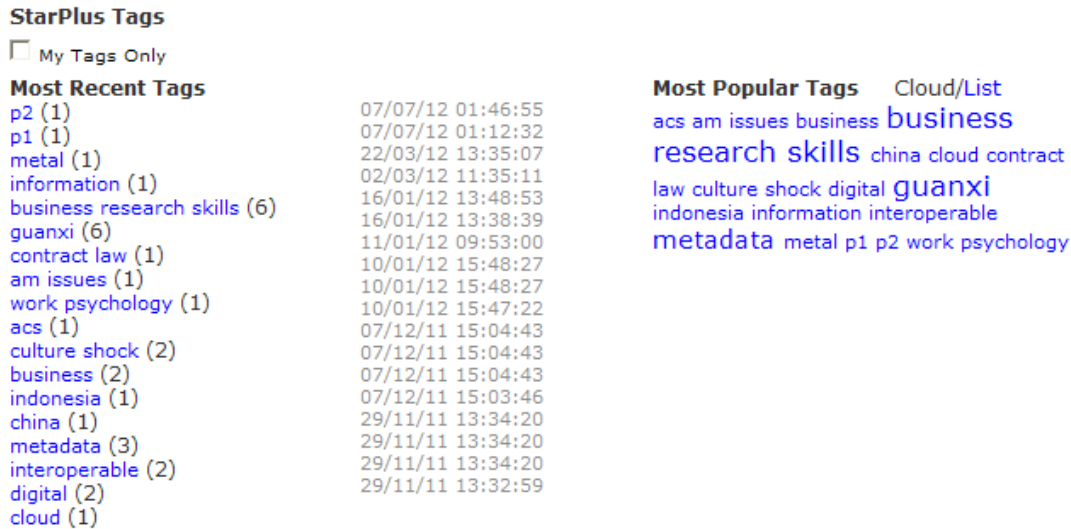
Figure 4: Example of StarPlus' tagging feature.

The interviewees' responses regarding the usefulness of tagging in StarPlus differed among the sub-groups. The majority of the librarians and post-graduate students said that the feature is useful, while most of the Librarianship students were unsure about its usefulness. Overall, the librarians thought that the feature would help students to locate subject-specific resources that their peers have found useful. Indeed, one of the post-graduate students commented that the tagging feature would assist them when selecting from a large number of resources. Another explained that the feature would be useful to them when they cannot think of search terms.

Conversely, the Librarianship students expressed concerns about the accuracy of the tags. Also, they pointed out that a single resource may be used for multiple purposes and read from different perspectives. Therefore, the feature will be more useful if it is tailored towards personal or course-specific use as a means of organising and drawing attention to resources. Several of the interviewees also expressed confusion as to how the feature works, not knowing if the tags are included in the catalogue's general searching index.

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When asked whether they would contribute tags themselves, one Librarianship student explained that adding tags is too time consuming. Also, while the librarians predicted that the feature will become more useful as users become aware of it, the Librarianship students doubted that enough tags would ever be contributed to make the feature effective. Nevertheless, three out of the five post-graduate students interviewed expressed an interest in contributing tags.
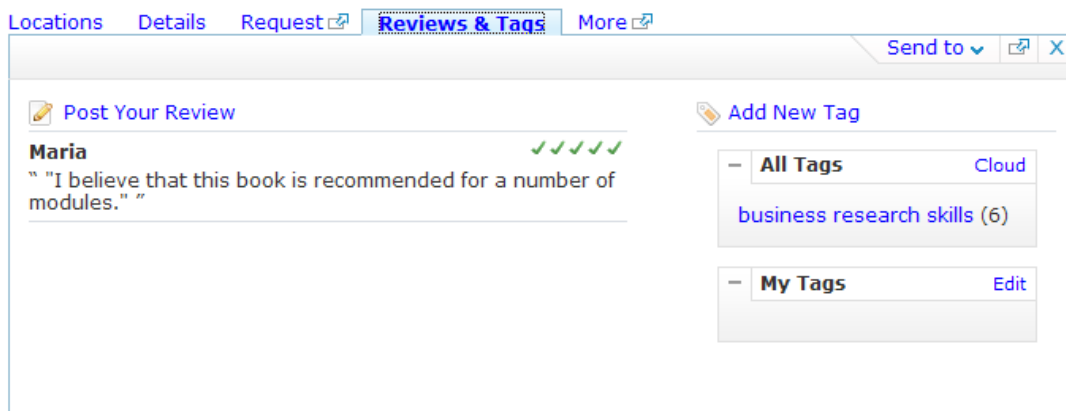
Ratings and reviews

Figure 5: Example of StarPlus' ratings and reviews feature.

All seven of the librarians and all five of the post-graduate students agreed that the ratings and reviews feature is useful. In particular, they mentioned that it would help students to "exchange knowledge" and select resources. Furthermore, the librarians suggested that the resource could be used by University lecturers or the Library to promote specific reading materials to students. When asked whether they think the feature will be reliable, most of the librarians expected the students to understand that the ratings and reviews are based on opinion. In comparison, the post-graduate students did not express any concerns regarding the trustworthiness of the reviews and would consider adding reviews themselves.

The responses given by the Librarianship students were more varied and critical. While two of them agreed that it "adds a lot more information" to the resource, two were unsure and another two said that the feature is not useful. Their reasons for not liking the feature were similar to their responses given towards the tagging feature. They were concerned that the resources will be reviewed from alternative perspectives by people on different courses. Therefore, they suggested that the feature be modified to cater for individual modules. They also thought that leaving and reading reviews would be too time consuming and that not enough users would leave comments for it to be useful.
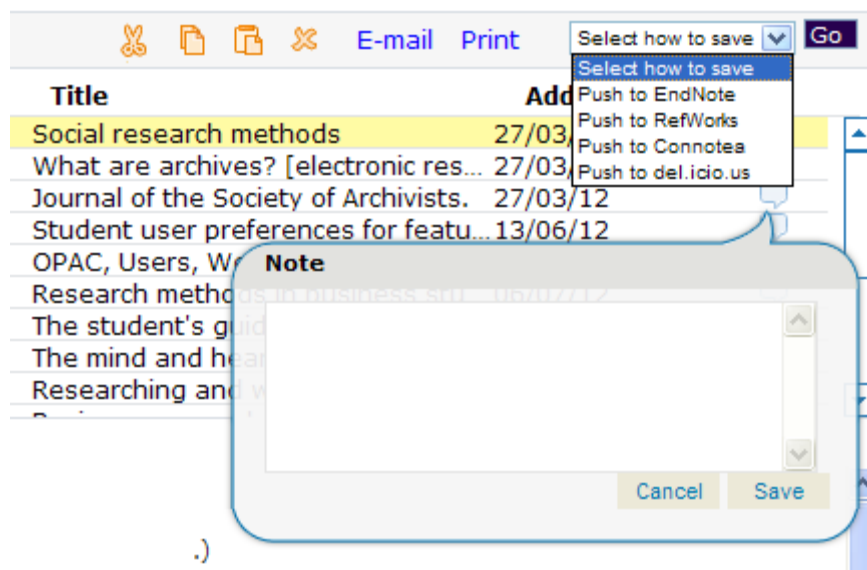
E-shelf

Figure 6: Example of StarPlus' e-shelf feature.

There was consensus among all of the interviewee subgroups that the e-shelf is useful. However, different reasons were given as to why they liked the feature. For example, one librarian said that it would be useful for students when referencing their assignments. Some of the interviewees said that the feature would be useful for creating reading lists or saving complicated search queries. Additionally, another librarian said that the feature could be useful for students

who are conducting group assignments because they can e-mail their research to each other. Overall, it was agreed that the feature is convenient and a time-saver:

> "…It's a good idea [because] I often find stuff that I want to come back to and then…I have to write it down or try and remember what it is…" *(LS3)*

Visual appearance and accessibility

All five of the post-graduate students and the majority of the Librarianship students liked StarPlus' visual appearance. In contrast, nearly half of the librarians believed that the interface could be improved. Those interviewees who liked StarPlus' visual appearance commented that it is: "clean", "simple", "easy to understand" and consistent with other next-generation catalogues. Similarly, the post-graduate students mentioned how the catalogue imitates popular Internet search tools. Most of the interviewees also liked the inclusion of book cover images because it is helpful when trying to recognise a book on the shelf or in the catalogue.

Those interviewees who disliked StarPlus' visual appearance said that there is too much unused space towards the top of the screen, causing the user to scroll down the page. As a result, the links that are located at the top of the screen become hidden. These links include the e-shelf feature, the user log-in and the help page. To overcome this issue, it was suggested that these links be statically positioned so that they remain visible on the page as the user scrolls down. Additionally, the meaning of some of the links could be made more explicit, including the advanced search option. Comments about the limited visibility of some of the features, including the e-shelf, were also made throughout the interviews.

Figure 7: Example of StarPlus' search results page.

Interviewees' overall impression of the StarPlus catalogue and its next-generation features

There was consensus among all seven of the librarians and the six Librarianship students that StarPlus is an improvement on the older Star catalogue. Similarly, all five of the post-graduate students said that they intend to use StarPlus now that they are aware of its features. Overall, the interviewees thought that it is easier to find relevant resources using StarPlus because the next-generation features render it more "flexible" and "sophisticated" than Star. For example, StarPlus' keyword search box and the faceted browser allow the user to enter broad query terms and browse vast numbers of results, while the advanced search option can be used for locating specific items. Furthermore, users can search for a wide range of resources from a single and "easy to understand" interface. They also appreciate being able to link directly to full-text articles.

Below are a few of the comments made by interviewees about StarPlus that summarise their overall perception of the interface:

"It's a good way of getting quick access to reliable information." *(L4)*
"It seems much more interactive and welcoming." *(LS2)*
"I think it's a lot better, I think it's a huge improvement on Star." *(LS6)*

Despite many of the interviewees claiming that StarPlus' interface is "easy to understand", they also thought that students would require training to be able to take full advantage of the features. In particular, the e-shelf, faceted browser and integrated content tab would need to be explained or demonstrated. Additionally, it was suggested that more on-screen information be provided within StarPlus as the "help" link is not immediately obvious. As a solution to this, one of the Librarianship students recommended adding tooltips to the interface.

Discussion

Interviewees' background knowledge and experience of using library catalogues and Internet search tools

The literature highlights that users favour Internet search tools over library catalogues and other institutional resources (Lewis, 2008; Sadeh, 2008; Sadeh, 2007). This perception was confirmed by the majority of the interviewees in this study, in particular the post-graduate students. However, the librarians and post-graduate students used the Internet and the Star catalogue in combination, implying that neither search tool was adequate. Not only does this reinforce the opinion that library users find the earlier OPACs difficult to use, it also shows that even librarians struggle to use these catalogues effectively (Merčun & Žumer, 2008; Antelman et al, 2006; Large & Beheshti, 1997). Nevertheless, the interviewees, in particular the librarians, were initially reluctant to use StarPlus

and therefore it is recommended that libraries actively promote their new catalogues.

Simple and advanced searching features including integrated content

It was discovered that the majority of librarians felt positively about StarPlus' keyword search box. In contrast, the literature suggests that librarians dislike the feature and instead favour the basic or advanced search options (Yang & Wagner, 2010; Emanuel, 2009; Ho et al, 2009). Furthermore, Yang & Wagner (2010) claim that librarians believe that the simple search box is confusing for users. Indeed, two of the librarians thought that users would be unsure about the type of information that can be entered into the search box. However, most of the librarians understood that their users expect the catalogue to emulate Google, and they thought that the keyword search box would be easier for them to use than the advanced search options.

In contrast, the literature indicates that students are accustomed to conducting keyword searches and therefore they favour this option (Craven et al, 2010; Emanuel, 2009; Tam et al, 2009). However, when asked about StarPlus' search options, the Librarianship students and post-graduate students gave varied opinions, with some preferring the simple search box and others favouring the advanced search options. From this response, it can be seen that the perceptions of library users towards searching features is more diverse than is acknowledged by the literature. Therefore, it is suggested that libraries provide multiple search options as well as on-screen information about the type of queries that can be entered into the simple search box.

There are few references within the literature regarding the perceived usefulness of integrating remote information resources within library OPACs. Overall, the interviewees appreciated being able to search multiple resources from a single search interface although they would prefer StarPlus' library collections tab to be combined with the integrated content tab. This suggests that users expect more

from next-generation OPACs in terms of integrated content than is currently being offered by Primo.

Faceted browsing

The literature provides strong evidence that faceted browsing is a popular feature (Denton & Coysh, 2011; Emanuel, 2011; Allison, 2010; Tam et al, 2009; Olson, 2007; Rosen, 2006, 2007 cited in Sadeh, 2008). This assumption has been confirmed by this study, as most of the interviewees strongly agreed that StarPlus' faceted browser is useful. Also, as the interviewees were from three distinct user sub-groups, it can be suggested that the feature is useful for people who have different levels of searching ability.

However, several of the librarians and Librarianship students implied that StarPlus' faceted browser is not as user-friendly as some of the literature indicates. For example, they stated that there are too many facets, some of which are hidden. Furthermore, it can be inferred from the Librarianship students' responses that the terminology used for some of the facets is ambiguous. This issue has also been highlighted by previous studies, which suggest that users become confused when the facets are too similar or when the sub-facets are duplicated (Denton & Coysh, 2011; Emanuel, 2011; Emanuel, 2009; Olson, 2007). However, improving the terminology used for the facets may involve adjusting the existing metadata, which is not always technically or economically viable (Denton & Coysh, 2011; Allison, 2010; Fagan, 2010).

Tagging

The previous research is inconclusive regarding the perceived usefulness of tagging, with library users giving varied opinions (Anfinnsen et al 2011; Allison, 2010; Craven et al, 2010; Emanuel, 2009; Ho et al, 2009). Similarly, the responses gathered by this study differ greatly. In particular, the Librarianship students gave specific suggestions for improving StarPlus' tagging feature thus implying that they had greater knowledge of it. They recommended that the

feature be customised to cater for personal or course-specific use. Similarly, academic staff at the University of Nebraska-Lincoln Libraries have used tagging to draw students' attention towards specific resources (Allison, 2010). Therefore, tagging may have potential within academic catalogues, although some users are not as attracted by Web 2.0 features as the literature suggests (Anfinnsen et al, 2011; Allison, 2010; Yang & Wagner, 2010; Sadeh, 2008).

Ratings and reviews

As with tagging, user perceptions towards ratings and reviews are also diverse. This is evident from the previous research and from the interviews conducted for this study. Comments derived from the literature and interviews suggest that the feature is helpful for when students need to make a resource selection from, for example, a course reading list (Emanuel, 2011; Tam et al, 2009). However, some of the Librarianship students doubted the usefulness of the feature because the reviews may be written by students who are on different courses to them. In contrast with the literature, the interviewees did not seem too concerned about the objectivity of the reviews (Emanuel, 2011; Tam et al, 2009). Nevertheless, the Librarianship students thought that writing and reading reviews would be too time-consuming and that not enough users would leave comments. Once again this indicates that users are not as interested in Web 2.0 features as the literature suggests (Yang & Wagner, 2010; Sadeh, 2008).

E-shelf

The available research and the interviewees' responses from this study strongly suggest that library users appreciate features that help them to manage and organise their research (Denton & Coysh, 2011; Emanuel 2011; Craven et al, 2010; Emanuel, 2009). Nevertheless, the interviewees still had ideas for how the e-shelf can be improved. For example, comments were made about the layout of the e-shelf page and the manner in which items in the list can be selected. Similarly, participants in previous user studies had very specific ideas for

improving the feature, such as the ability to organise the information into folders (Emanuel, 2011; Craven et al, 2010). This suggests that library users have diverse expectations for the functionality of such a feature.

Visual appearance and accessibility of the features

The previous research suggests that library users find next-generation catalogue interfaces to be "clean", "intuitive" and "user-friendly" (Denton & Coysh, 2011:317; Emanuel, 2011:50). In confirmation of this, the majority of the interviewees from the present study commented that StarPlus' interface is "simple" and "easy to understand". However, some of the librarians believed that StarPlus' links and features need to be emphasised while the Librarianship students commented on the limited visibility of particular features. Therefore, it can be argued that the Primo interface is not as "intuitive" as previously suggested by the literature or the interviewees' initial perceptions (Denton & Coysh, 2011; Emanuel, 2011; Sadeh, 2008). Consequently, it is important that libraries determine how visible the links and features are within their OPACs.

With regards to the inclusion of book cover images, the responses from this study were inconsistent with those from a 2008 study by Tam et al (2009), which determined that its participants did not think the images would be useful. In contrast, most of the interviewees from this study commented that the cover images would help them to identify books on the library shelves or in the catalogue. Similarly, the participants in a Copac development study used book cover images to help them locate particular items (Craven et al, 2010). Therefore, it is recommended that book cover images are incorporated into OPACs.

An overall impression towards next-generation catalogues

There is consensus between the previous research and this study that users favour the next-generation catalogues to traditional library OPACs (Denton &

Coysh, 2011; Emanuel, 2011; Emanuel, 2009). In particular, users find the catalogues more user-friendly due to the next-generation features, which offer multiple methods of finding a range of resources from a single interface. This study also confirms that users have a preference for the searching and browsing options rather than the Web 2.0 features, even though it has been claimed that users expect and are accustomed to using social networking tools (Yang & Wagner, 2010; Emanuel, 2009; Tam et al, 2009; Sadeh, 2008). Nevertheless, the integration of tagging and reviews into library catalogues has potential, so long as the features are promoted and made relevant to users.

The literature provides varied opinions regarding how easy the next-generation catalogues are to use. Ultimately, they are designed to be an improvement over traditional OPACs, which required the user to conduct "known-item" searches and as a result did not support subject searching well (Merčun & Žumer, 2008; Antelman et al, 2006; Large & Beheshti, 1997). Therefore, it has been suggested that the next-generation OPACs are "intuitive", particularly for users who are accustomed to finding information on the Internet (Denton & Coysh, 2011:317; Emanuel, 2011:50; Sadeh, 2008:12). However, it has also been claimed that not all users understand how the features work and that the catalogues are more suited towards those users who already have a basic understanding of library OPACs (Allison, 2010; Emanuel, 2009). Indeed, this study has suggested that students and librarians require more training on the StarPlus catalogue if they are to use it effectively. It is also recommended that on-screen information about the features is provided via tooltips or pop-up windows (Craven et al, 2010).

Table 4: Discussion summary

	Previous studies	Current study
Simple search	Librarians dislike Users like	Librarians like Users mixed
Faceted browsing	Liked	Liked, with some qualifications
Tagging	Mixed views	Librarians and PGT students like Library students dislike
Rating and reviews	Mixed views	Librarians and PGT students like

		Library students dislike
E-shelf	Liked	Like but could be improved
Intuitive look	Liked	Liked Librarians believe could be improved
Book covers	Not liked (Tam et al. 2009)	Liked
Overall	Liked by users Librarians sceptical	Liked

Conclusion

With the development of exciting and engaging new forms of web site such as Google and Amazon, the design of OPACs has had to be reconsidered. User expectations have been revolutionized by the alternative methods of searching and browsing now available online Not all the features of Web 2.0 sites are likely to work in the context of library material. The needs of those seeking information in the library context are often different, e.g. much more specific searches are being conducted. Systematic studies of user responses to new interface designs are needed. In this context, the research reported in this paper seeks to contribute to our understanding of which aspects of new designs are most effective, differentiating the response of a number of user groups.

Next-generation interfaces are seen to offer an improvement over the traditional library OPAC because they facilitate searching across a wide range of resources via a single interface. The interfaces are also more flexible, allowing users to select their own preferred searching or browsing method. Indeed, this study has ascertained that the searching preferences of users is more complex than the literature indicates (Craven et al, 2010; Yang & Wagner, 2010; Emanuel, 2009; Ho et al, 2009;Tam et al, 2009). In other words, it cannot be assumed that a specific sub-group of library users search in a similar way. For example, some of the students who were interviewed as part of this study preferred to use the

keyword search box while others favoured the advanced search option. Nevertheless, most of the interviewees used a combination of different search tools, indicating that neither the Internet nor the traditional library catalogue could fully meet their information retrieval needs.

This study has also found that librarians and students have similar opinions regarding the usefulness of next-generation OPAC features. In particular, the interviewees agreed that the keyword search box is useful despite the literature suggesting that librarians are more favourable towards advanced search options (Yang & Wagner, 2010; Emanuel, 2009; Ho et al, 2009). This indicates that librarians are more aware of their users' expectations for the Library's catalogue and are less critical of the next-generation features than the literature suggests. The Librarianship students were the most critical of all the user groups towards the features, although this may be due to their background, which has enabled them to be more perceptive towards catalogue usability and design issues.

In confirmation of some previous studies, the interviewees appeared to prefer the searching and browsing options over the Web 2.0 features (Emanuel, 2009; Tam et al, 2009). This is in contrast to the literature which indicates that users expect Web 2.0 features to be included in the library catalogue (Yang & Wagner, 2010; Sadeh, 2008). Nevertheless, these features are potentially useful provided that they are made relevant to user needs. For instance, the interviewees strongly agreed that StarPlus' e-shelf feature was useful, which suggests that users favour personalised features that are convenient and time saving.

Overall, this study suggests that while the next-generation catalogue interfaces and features are useful, they are not as "intuitive" as some of the literature suggests, regardless of the users' searching skills (Denton & Coysh, 2011:317; Emanuel, 2011:50; Sadeh, 2008:12). The librarians and Librarianship students commented that some of StarPlus' links and features were neither immediately obvious nor self-explanatory. Furthermore, it is evident that some of the

librarians were reluctant to change their information seeking habits because they perceived that learning to use StarPlus would be time consuming.

Limitations of the study and recommendations for further research

This study was limited by the range of users interviewed. For instance, the number of discipline groups surveyed was restricted, and the study could have been further extended by including librarians from different sectors of the Library. Also, the study would have benefitted from including undergraduate students, whose experiences of using library catalogues, the Internet and Web 2.0 tools could have provided the basis for a wider scope of conclusions.

To address these limitations, it is recommended that further research is conducted to investigate the perceptions of undergraduate students towards next-generation catalogues and their features. Such research could seek to determine whether students from different discipline backgrounds have similar opinions. It can also be argued that the Web 2.0 tools require further investigation to ascertain how they can be made more relevant to users working within an academic context, who appear to be more concerned with saving time than adding content. Additionally, further usability studies should consider how the OPAC features can be made more visible on the interface and easier to understand, possibly by providing on-screen information.

Recommendations for libraries

Specific design suggestions have been made in relation to a number of key features in the findings section. In general, the results of this study would suggest that libraries need to actively promote their next-generation catalogues to students as well as librarians. This study shows that the students were largely unaware of StarPlus, while the librarians were reluctant to use it. Furthermore, libraries are motivated to conduct systematic user studies prior to and following the implementation of their next-generation OPACs, so to determine methods of optimizing the catalogue's relevance to users (Craven et al, 2010).

Word Count : 8165

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Appendix: Semi-Structured Interview Questions

Opening questions

1. How familiar are you with using the Library's Star (old) catalogue?
Probes: frequency of use; purpose of use e.g. browsing, searching for specific titles etc.

2. How easy do you find searching for information resources using the Star (old) Library catalogue?
Probes: relevancy of results; number of results; tools for query formulation; information displayed for the results.

3. How familiar are you with the Library's StarPlus catalogue?
Probes: frequency of use; purpose of use; knowledge of how to use it; knowledge of differences between Star and StarPlus; confidence in using it.

4. On average, how often do you use Star/StarPlus?
Star

Everyday	Every two days	Once a week	Once a fortnight	Once a month	Other
☐	☐	☐	☐	☐	☐

StarPlus

Everyday	Every two days	Once a week	Once a fortnight	Once a month	Other
☐	☐	☐	☐	☐	☐

5. Have you used other Library catalogues?
Probes: at other universities; public library catalogues; COPAC; frequency of use.

6. What search tools, besides library catalogues, do you use to find or browse for academic books/information?
Probes: Google; Google Scholar; Amazon; Academic databases; frequency of use.

7. What do you prefer using the most: Internet search tools or library catalogues? Why?
Probes: ease of use; relevancy of results; number of results; browsing capabilities; academic quality of materials; specific features e.g. ratings/reviews, web 2.0 etc.

Questions about the searching and browsing features

8. How useful do you think the simple search box feature is?
Probes: keyword searching; query formulation; integrated content; preference for advanced search feature?

9. How useful do you think it is to have an advanced search option in addition to the simple search box?
Probes: advanced query formulation.

10. How useful do you think the faceted browser feature is?
Probes: terminology used; categories (e.g. formats); date ranges; number of items under each facet; prior awareness/ experience of using facets for browsing search results; "suggested new searches"

11. How useful do you think the spellchecker/ did you mean… feature is?
Probes: prior awareness/ experience of using spellcheckers.

12. How useful do you think the "Articles and more tab" is?
Probes: would use?; Primo central; Find databases; Quick sets; easier than searching individual databases?; everything is in one place/interface (integrated content).

13. Which catalogue do you think is the most useful for finding information resources: Star or StarPlus?
Probes: relevancy of results; number of results; browsing using the faceted browser; query formulation; links to full-text online resources; terminology used; use different catalogues for different tasks?

Questions about the web 2.0 and Amazon features

14. How useful do you think the Tagging features are?
Probes: incentive for contributing tags (i.e. helping others to find information); making resource selection; browsing information resources; quality of the information; awareness of the contributor (status of); preference for tag cloud or tag list; ability to summarise a resource using one word; prior awareness/ experience of tagging; ease of use/ enhanced user experience; administration.

15. How useful do you think the rating/ review features are?
Probes: would use in Amazon/commercial sites?; incentive for contributing ratings/reviews; resource selection; reliability/ objectivity of the information; volume of reviews (reliable source); better to link to Amazon reviews?.

16. How useful do you think it is to have links to additional content from the item records?
Probes: tables of contents via Amazon; link to Copac; link to WorldCat; alternative copies; resource selection; visibility.

17. How useful do you think the e-shelf feature is?
Probes: management of results; list favourite resources; push items to reference management tools; email/ print search results; save queries.

Closing questions

18. What do you think of the visual aspects of the StarPlus catalogue?
Probes: book cover images (help to recognise the resource?); format icons; layout of results; location of search box/facets etc; visibility of the features.

19. What is your overall opinion of the StarPlus catalogue and the features demonstrated?
Probes: Usability (would use again?); easier to use than the Star catalogue; would add/remove any features? Like/dislike.

20. Thank you for taking part in this research. Before we finish, is there anything that you would like to ask me?