

Abstract

LINC+: Our leap towards a Web 2.0 OPAC interface

As internet search engines compete with online library catalogues as *the* source of information, the NUS Libraries faces the ultimate challenge of being the preferred gateway for finding information. We respond to this by providing user-centred information services and have begun our journey of revitalising our OPAC to make materials more easily accessible to our users. We leap from a Web 1.0 LINC (Library Integrated Catalogue) towards a Web 2.0 OPAC by offering a new menu of features to delight the millennial generation of users. Encore is our new discovery services platform which offers Web 2.0 features such as faceted search and tagging. The new Popular Choices feature suggests items based on circulation and community popularity while Patron Ratings and Community Reviews provide yet another channel of discovery for the user. Encore promises to transform the user experience by going beyond the conventional online library catalogue and strategises the quest for information in a single search interface.

Introduction

Meeting the needs of the Millennial generation of users is both challenging and fascinating. These users seem to be web-savvy, accustomed to the interfaces of sophisticated websites, possess great social networking skills and want to communicate constantly with their peers. Above all, they want information at the touch of their fingertips.

Current library online catalogues have limitations which do not meet the expectations of the Millennial generation: users can only use the catalogue to search for library materials such as books and journals and have to use other databases or interfaces to search for the contents within these library materials, such as book chapters and journal articles.

Users today are familiar with intuitive interfaces and aesthetically pleasing websites. In addition to functionality, library websites should not lack visual appeal (Breeding, p. 30). Libraries are therefore compelled to not only provide better capabilities to search, retrieve and access relevant results but also friendly, attractive search interfaces for users. Faced with this scenario, the NUS Libraries embarked on a journey of revitalising the OPAC to make resources more easily accessible and the interface more pleasing to our users. We are competing with the Internet as *the* preferred source of information, moving away from a traditional web OPAC and taking a leap towards a Web 2.0 interface as the gateway for finding information.

LINC Usability Survey

In order to determine the needs and wants of users, in particular, our academic staff and students who form an important main group of users of our OPAC, a LINC Usability Survey was conducted in September 2007. The survey was administered online as well as through the traditional channel of paper-based questionnaire.

The objectives of the survey were two-fold. Firstly, to determine which features available in LINC, our **L**ibrary **I**Ntegrated **C**atalogue, were important to retain; secondly, to establish what new OPAC features were considered essential. A variety of question types were

used in the questionnaire, which included multiple-choice questions, open-ended as well as scale ratings. The survey questionnaire can be found in Appendix 1.

Survey Findings

1. Current OPAC

Below are some findings which indicate how the users feel about certain aspects of the present OPAC, such as resource types searched, search options and the display of search results. Their feedback is important and affirms what we have done well with the current OPAC which should be retained in our desired OPAC.

- **Resource Types Searched**

Figure 1 shows the frequency of searching for the various resource types. The top three resource types searched for in LINC were Books, Course reserves and Journals.

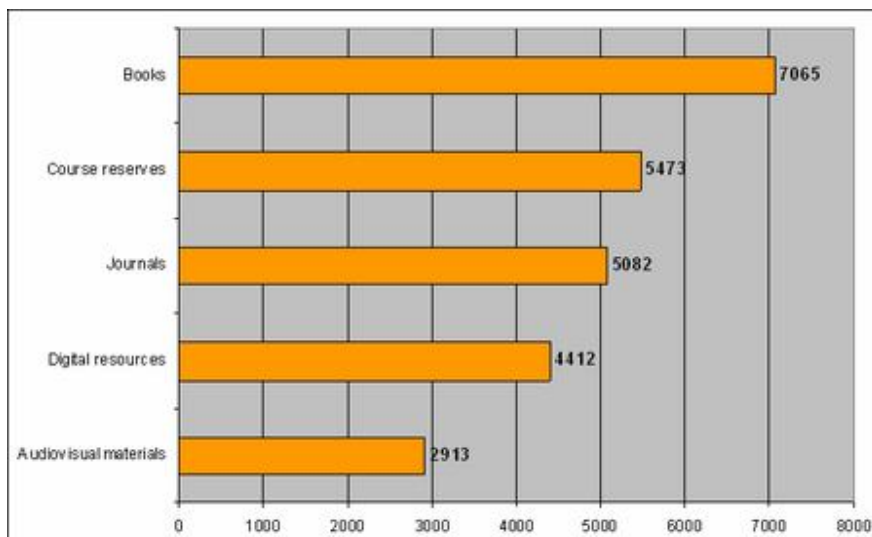


Figure 1: Resource types searched

- **Search Options**

Figure 2 shows the responses to the question: Are the search options clearly organised in LINC? This referred to whether the categories for the different search options were precise and exact and if they helped the users to select the correct options, enabling them to retrieve relevant results. It is heartening to note that 92.6% of the feedback on this was positive.

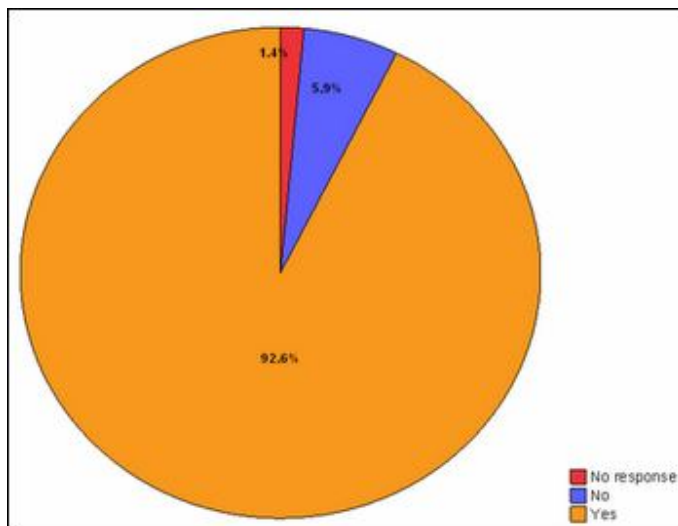


Figure 2: Are the search options clearly organised in LINC?

Figure 3 shows the frequency of use of the various search options available in the current OPAC. The top three most frequently used were: Simple keyword, Title and Author.

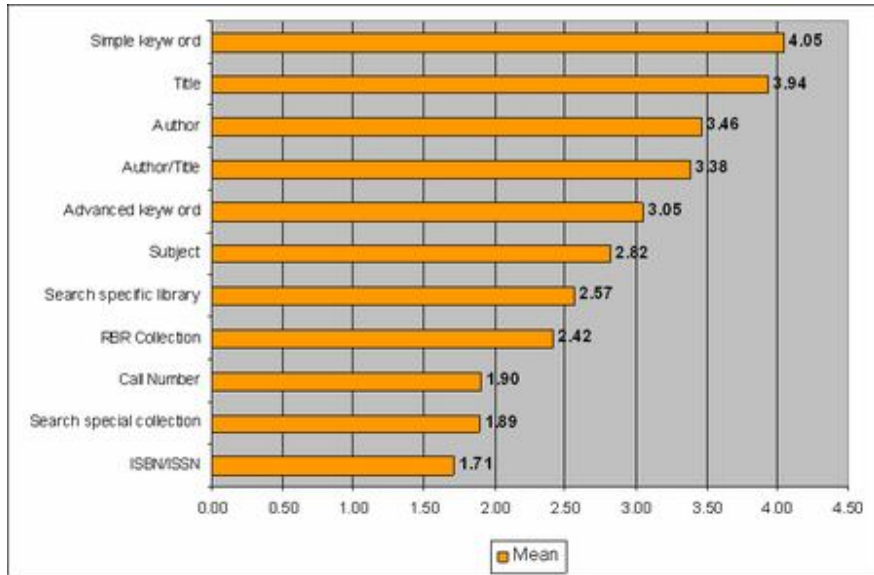


Figure 3: Frequency of use of search options

- **Display of Search Results**

Figure 4 shows the satisfaction of our users with the display of search results in the current OPAC. The survey results showed that 84.3% of the respondents found that the search results were displayed in a manner that was clear and simple. In addition, 90.3% indicated that the instructions and icons in LINC were concise and easy to understand. 81.8% did not need to use any of the help screens.

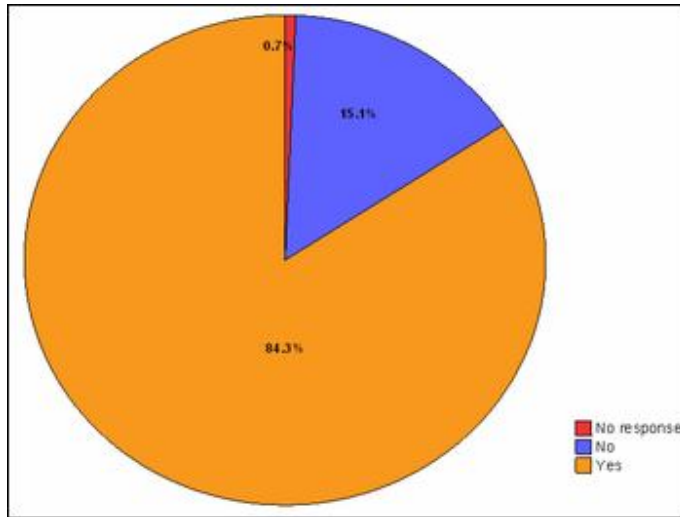


Figure 4: Satisfaction with the display of search results

2. New Features

This section of the survey sought the users' views on the new features they would like. The top three new features considered important to the respondents were: Categorising their search results by subject, author and year, Searching across multiple databases and library catalogues and Knowing what were the most popular or related titles.

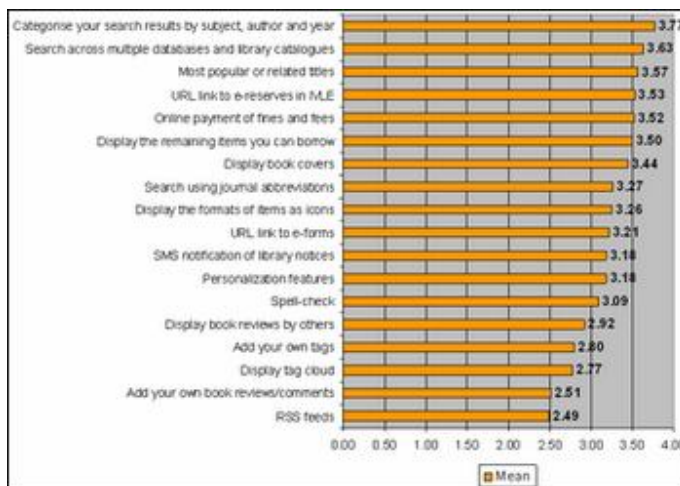


Figure 5: New features desired by users

The table below shows the ranking of the features in importance by the users, as well as their functionality in the suite of products which we have purchased.

Survey Ranking	Survey Features	New OPAC Features
1	Categorise your search results by subject, author and year	Faceted browsing
2	Search across multiple databases and library catalogues	Federated searching
3	Most popular or related titles	Popular choices
7	Display book covers	Enriched content
9	Display the formats of items (e.g. book, CD, journal) as icons	More visual display
13	Spell-check	WebPAC Pro
14	Display book reviews by others	Syndetic
15	Add your own tags (i.e. using your own keywords to label the item)	Tagging
16	Display tag cloud (i.e. grouping of tags by usage frequency)	Tag clouds
17	Add your own book reviews/comments	Community reviews
18	RSS feeds	RSS feeder
		Relevancy ranking
	Google-like search	

The features to be included for consideration in our future plans are as follows:

Survey Ranking	Survey Features
4	URL link to e-reserves in IVLE
5	Online payment of fines and fees
6	Display the remaining items you can borrow
8	Search using journal abbreviations (e.g. JAMA)
10	URL link to e-forms (e.g. intralibrary loan, document delivery)
11	SMS notification of library notices
12	Personalisation features (e.g. bookmarking preferred titles)

3. Preferred Search Interface

In response to the question on comparing LINC with other search interfaces such as Amazon, Google and the NLB Catalogue, Google emerged as the most popular search engine. The reasons for giving Google the thumbs up were that it was easy to use, and much information was retrieved using Google. Users also felt they were able to find the required information from their Google searches and this was delivered in a timely manner.

Our Next-Generation Online Catalogue

For our choice of the next-generation of integrated online catalogues available, the NUS Libraries will be using a suite of products from Innovative interfaces such as Encore, Research Pro and WebPAC Pro to provide a more unified approach to finding information resources. This is intended to transform the user experience by leveraging on Web 2.0 technologies and to address the features such as categorising search results, multiple database search and popular titles requested in the survey.

Our new online catalogue, known as LINC+, provides the Google-like search engine preferred by our users. LINC+ will reside on the portal home page to make searching for library resources possible in a seamless manner between the portal and the OPAC. The screen capture below shows the design of the library portal interface.



Figure 6: Design of the library portal interface

Based on the positive feedback received on the current OPAC, LINC will be provided as a search option as LINC+ is very different from LINC. While users become accustomed to searching LINC+, it would be helpful for users to be able to search the current OPAC until it is eventually phased out.

Federated Searching via Single Search Interface

When a user enters a search term in LINC+, search results from the library catalogue as well as from selected predefined databases set up by the NUS Libraries will be retrieved. LINC+ allows federated searching and users would be delighted to search only a single interface to obtain the articles they want. This feature is ranked second in importance by users in the survey. Federated searching is facilitated by Innovative Interfaces' Research Pro, where the results

are shown at the bottom right of the page. This is highlighted in the screen capture below.

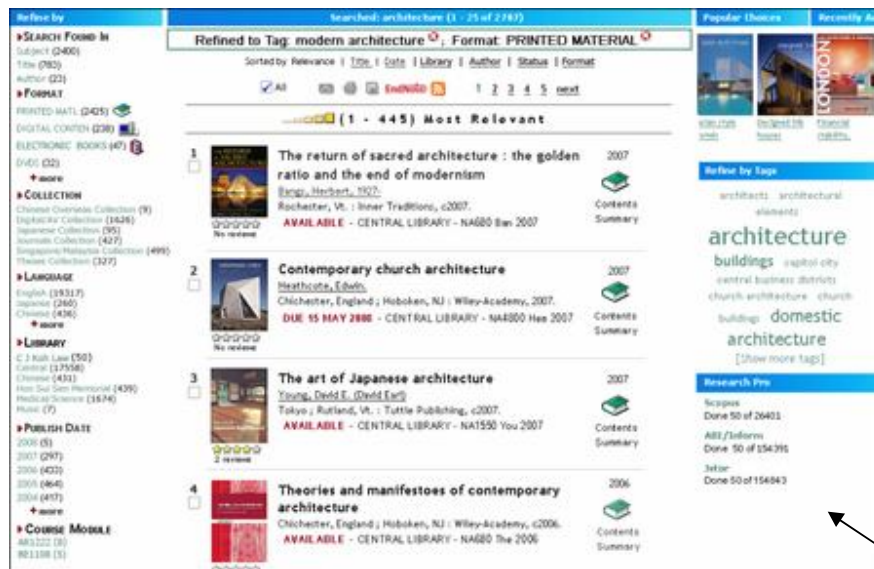


Figure 7: Results from federated search interface

Results from Research Pro

Web 2.0 Features in LINC+

- Faceted Navigation

Facets



Figure 8: Facets help to narrow the search

The highlighted facets in the narrow left column are grouped according to categories such as format, collection, language and date. The facets are data existing in the bibliographic record, so faceted navigation effectively makes efficient use of the preexisting data. Each format facet is represented by an icon that helps in visual identification.

Faceted browsing allows users' search results to be categorised by subject, author and year. This feature was ranked highest in importance in the survey. There is a section "Search Found In" at the top of the facets column and this indicates the field in which the term is found. The results list shows the matches in different fields such as title, subject and author. This feature is helpful to the user by focusing on the results and narrowing down the search.

- **Relevancy Ranking**

LINC+ provides relevancy ranking for the retrieval of more relevant titles. The results obtained are grouped according to relevancy. Each group of results falls under a label showing bars that reflect the strength of relevancy and the number of items within that level. Although the default search order is by relevancy ranking, the user can change the sorting order to title or date by clicking on the links at the top of the ranked results.

Results ranked by relevance

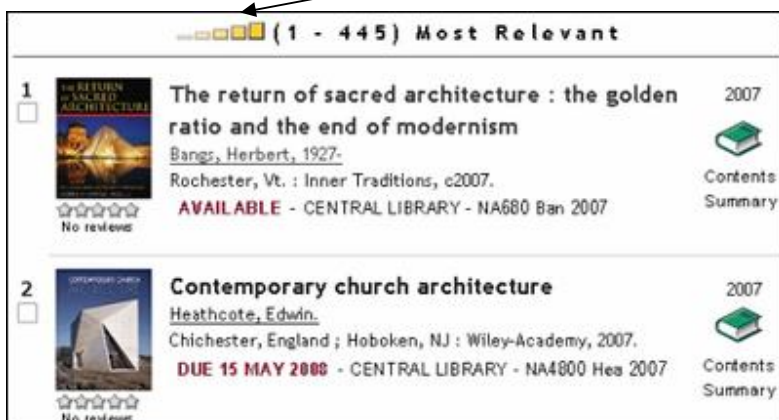


Figure 9: Results obtained grouped according to relevancy

- **Tag Clouds**

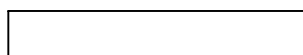
The tag cloud appears under the section “Refine by Tag” in the right column of the page. The tags come from two sources, namely, from the subject headings and user input. The size of the tag increases with importance and the frequency of use. “Add your own tags” and “Display tag cloud” are features requested in the survey. Tagging is possible in LINC+ but the release of this feature is being considered.



Tag Clouds

Figure 10: Size of tags indicate importance and frequency of use

When the user clicks on a tag from the cloud, a narrowed set of results is displayed and the tag selected appears in the trail-of-breadcrumbs links at the top of the results list. This allows the user to



select and deselect the facet without removing the ones in the trail.

The screen capture below shows the highlighted trail-of-breadcrumbs just above the relevancy ranking.



Figure 11: Trail-of-breadcrumbs shown above relevancy ranking

- **Popular Choices**

The feature "most popular or related titles" was ranked third in importance in the survey and users would be delighted with the Popular Choices feature in LINC+. The upper right corner when LINC+ displays the search results is labeled "Popular Choices". Initially this feature will display three items. These are calculated to be of the strongest interest, and additional items can be seen when the navigational bars are scrolled. The Popular Choices feature suggests items based on circulation and community popularity. This feature can also be used to display new items in the collection that are relevant to the user's query.



Figure 12: Popular Choices feature displays new items relevant to the search

- **Recently Added**

The Recently Added feature in LINC+ alerts users to the new titles added to the library collection in order for them to keep informed of the latest titles.



Figure 13: Recently Added titles

Enriched Content

As part of our upgrade to LINC+, cover image display is available and shows the image of the book covers in both the brief record and full record views, achieving a pleasing visual appeal as shown below.

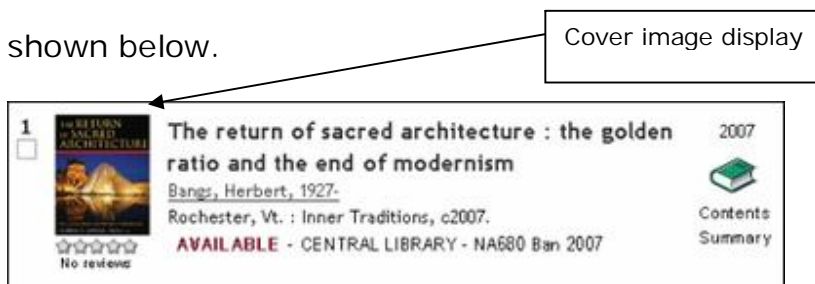


Figure 14: Cover images enhance the record display

The cover image display and the icons representing the format of the materials are the enriched content also requested by the users in the survey. Reviews, summaries and author notes are other examples of enriched content available in LINC+.

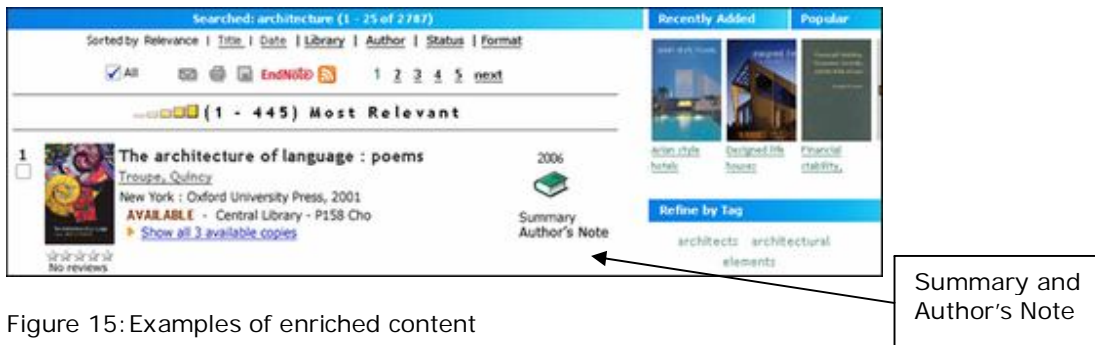


Figure 15: Examples of enriched content

Summary of Features in LINC+

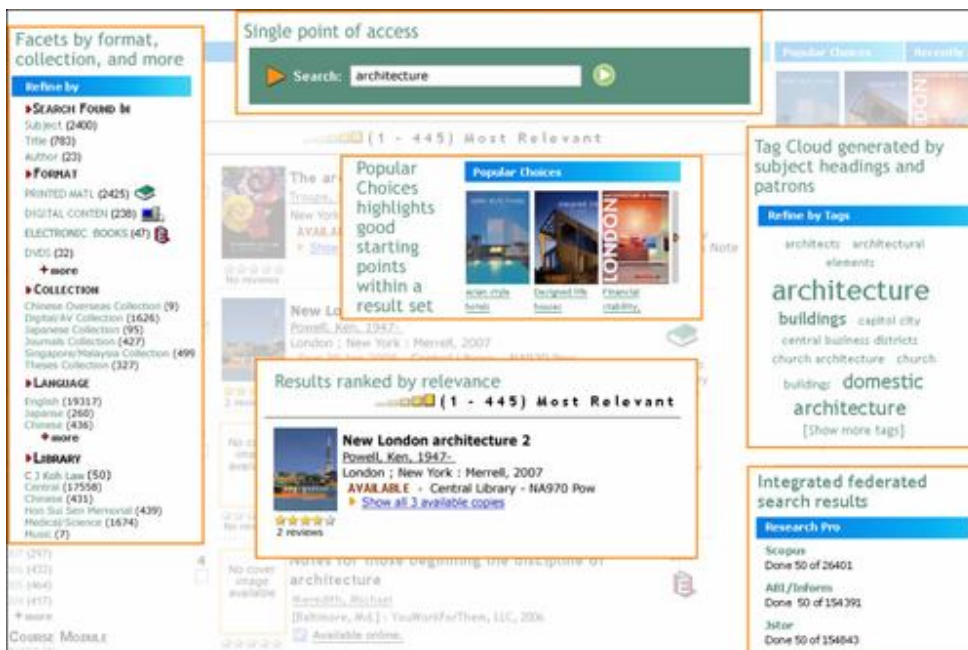


Figure 16: Features in LINC+

Meeting the Web 2.0 Challenges

The next phase towards a Web 2.0 OPAC involves incorporating social computing into a resource for the users. We are exploring into

the possibility of integrating popular social networking sites such as Facebook into our OPAC. By incorporating these sites from the OPAC, users can make online friends, interact, share knowledge, create content and search our OPAC.

LibraryThing enables users to create their personal online libraries and add their own tags to each entry. By exploring the possibility of placing these links to such sites in the OPAC, the NUS Libraries hopes to invite and encourage user participation and involvement. With these links in the OPAC, users are able to access their favourite sites from the library catalogue without having to go to different places for the different social networking tools.

Tagging and social bookmarking sites such as Del.icio.us allows users to bookmark web pages, check on what other users bookmark, as well as organise their bookmarks in one place for portability. When more people bookmark something, there would be an increase in the search results (Rethlefsen, p. 26). With such sites in the OPAC, users are empowered and will be able to find information on any topic by clicking on a tag, accessing their favourite sites from the library catalogue. RSS (Really Simple Syndication or Rich Site Summary) is another Web 2.0 tool which can allow subscribed users to obtain recently added titles from the OPAC. In the social networking environment, to provide links to many exciting features on the library

website and encourage users to add content from the library site is the “best thing a library can do” (Stephens, p.45). This provides them with the convenience of being able to go to the popular social networking sites from only one source.

Beyond Users’ Expectations

Users are in for an exciting journey of discovery with LINC+ and the Web 2.0 features being planned in the new OPAC. The NUS Libraries promises to be the users’ one-stop access “for knowledge, for inspiration, for life”.

With the leap towards a Web 2.0 OPAC, the NUS Libraries continues to provide excellent services and convenient access to its rich resources, supporting users’ endeavours in the quest for information by encouraging user involvement and interaction, delighting users beyond their expectations.

Bibliography

Breeding, Marshall. 2006. Web 2.0? : let’s get to Web 1.0 first. *Computers in Libraries* 26(5):30-33.

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Stephens, Michael. 2007. Web 2.0 & libraries, Part 2 : trends and technologies. *Library Technology Reports* 43(5):1-80.

Tennant, Roy. 2007. Demise of the local catalog. *Library Journal* 132(12):26.

Appendix 1



Making LINC Better for You – A Survey

The **NUS Libraries** would like to invite you to participate in this survey on the features of our *Library INtegrated Catalogue (LINC)* – the online catalog. Let us know what works well and what can work better in LINC. Your input will help us determine which features and services are important to retain, as well as new functions you would like to see.

This survey will take approximately **15 minutes** to complete. Please submit the completed survey to us **before 1 October 2007, Monday**.

The information gathered in this survey is **confidential** and no identifying information will be used or published.

Thank you!

Use of LINC

1. How frequently did you use LINC in the last twelve months?

- Daily
- At least once a week
- At least once a month
- At least once a year
- Not at all

2. What were you using LINC for?

(Please rank the following in order of frequency: 1 = Most Frequent and 5 = Least Frequent)

Checking what I have borrowed	<input type="text"/>
Renewing books	<input type="text"/>
Requesting for materials	<input type="text"/>
Searching for library resources	<input type="text"/>
Viewing new additions to the Library	<input type="text"/>

Please specify if you use LINC for other purpose(s):

Search Features

3. When looking for resources in the Library, do you:

(Please select all that are applicable)

- Ask a librarian to help you use LINC?
- Browse the shelves without using LINC?

- Use LINC on your own to find what you need?
- Others (please specify): _____

4. What resources do you search for in LINC?

(Please rank the following in order of frequency: 1 = Most Frequent and 5 = Least Frequent)

Audiovisual materials	
Books	
Course reserves	
Digital resources	
Journals	

Please specify other resource(s) that you search for in LINC:

5. How frequently did you use the following search options when searching in LINC?

(Please rate each search option based-on frequency of use)

	Not at All			All the Time	
	1	2	3	4	5
Simple keyword	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced keyword	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Author	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Title	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Author/Title	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Subject	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ISBN/ISSN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Call Number	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RBR Collection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search specific Library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search special collection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. How successful would you consider your searches?

- I got the desired results on the first search
- I had to do additional searching to get the desired results
- I approached a librarian for help to get the desired results
- I gave up before finding useful results
- Others (please specify): _____

Display and Help Features

7. Are the search options clearly organized in LINC?

- Yes

No (please state reason): _____

8. After conducting a search, are the search results displayed in a manner that is easy to read and understand?

- Yes
 No

9. Are the instructions and buttons in LINC clear and easy to understand?

- Yes
 No

10. Did you need to use any of the Help screens?

- Yes (please proceed to Question 11)
 No (please proceed to Question 12)
 Could not find them

11. If you used any of the help screens, were they useful?

- Yes
 No (please state reason): _____

New Features

12. The following are some new features that we are considering to implement for LINC:

(Please rate each feature based on importance)

	Least		Most		
	Important		Important		
	1	2	3	4	5
Add your own book reviews/comments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Add your own tags (i.e. using your own keywords to label the item)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Categorise your search results by subject, author and year	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display book covers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display book reviews by others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display tag cloud (i.e. grouping of tags by usage frequency)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display the formats of items (e.g. book, CD, journal) as icons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Display the remaining items you can borrow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most popular or related titles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online payment of fines and fees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personalisation features (e.g. bookmarking preferred titles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RSS feeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search across multiple databases and library catalogues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search using journal abbreviations (e.g. JAMA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SMS notification of library notices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spell-check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
URL link to e-forms (e.g. intralibrary loan, document delivery)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

URL link to e-reserves in IVLE



Comparison with Other Search Interfaces

13. If you use any of the following search interfaces, please rate your overall experience as compared to LINC and state the reason(s):

(Please rate each item based on satisfaction as compared with LINC)

	Least Satisfied		Most Satisfied			Reason(s)
	1	2	3	4	5	
Amazon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Google (include Google Books, Google Scholar)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
National Library Board (NLB) Catalogue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

Please specify other search interface(s) that you have used:

Overall Impression

14. How would you rate the overall usability of LINC?

- Very difficult *(please state reason):* _____
- Difficult *(please state reason):* _____
- Moderate
- Easy
- Very easy

15. How would you rate your overall satisfaction with LINC?

- Very satisfied
- Satisfied
- Not satisfied *(please state reason):* _____

16. Please share with us any additional comments or information on your searching experience with LINC, including the best and worst features in LINC:

Information About You

17. Faculty / School

- Arts & Social Sciences
- Business
- Computing
- Dentistry
- Duke-NUS GMS
- Design & Environment
- Engineering
- Law
- Medicine
- Music
- NGS
- Public Policy
- Science
- USP
- Other (*please specify*) : _____

18. User Category

- Faculty/Research Staff
- Administrative/Professional Staff
- Undergraduate Student
- Graduate Student
- Exchange Student

The following information is optional, but would be useful for us to contact you for clarification, if needed.

19. Name

20. Email address

Thank you for taking the time to participate and complete this survey.
Please return your completed survey at the **Information Desk** at any of our libraries before
1 October 2007.