



Queensland University of Technology
Brisbane Australia

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A survey of the application of Web 2.0 in Australasian university libraries

Abstract

Purpose: The paper aims to provide an overall picture of application of Web 2.0 technologies in Australasian university libraries. The focus of the research was what types of Web 2.0 technologies applied in such libraries as well as their purposes and features.

Design/methodology/approach: Content analysis was used in terms of quantitative approach. A checklist as the main research instrument was developed based on other checklists and questionnaires, and synthesized ideas from literature. Data were collected by accessing all Australasian university library websites within two weeks. Then, Microsoft Excel was utilized as a main tool to synthesize and analyse data, and present results.

Findings: At least two third of Australasian university libraries deployed one or more Web 2.0 technologies. Only 4 Web 2.0 technologies were used for specific purposes and with some basic features. The general Web 2.0 application indexes were still low as the mean application index was 12 points and the highest index was 37 points (out of 100)

Research limitations/implications: A combination of content analysis with survey and/or interview may enable future researchers to analyse other aspects (eg. the application of internal Wikis or the use of Instant Messaging for reference services) of Web 2.0 that a single method of content analysis could not gain.

Originality/value: This unique study explores the application of Web 2.0 in a wide scope including any Australasian university libraries that deployed any types of Web 2.0 technologies. This study is useful for Australasian university libraries in evaluating/deploying Web 2.0. Library managers, librarians and other university libraries may also find this helpful once they want to implement such technologies in their libraries.

Keywords: Web 2.0, RSS, Blogs, Instant Messaging, Wikis, Podcasts

Paper type: Research paper

1. Introduction

The last two decades have witnessed the rapid transformation of the library in applying information technology. Libraries have developed and diversified their services based on advanced information communication technologies. A typical technology is Web 2.0 which has recently emerged as a second generation of web-based technologies for communication. Web 2.0 has been strongly applied in the field of e-commerce, online advertising and other online services. However, it has not been a widely applied technology in the library community (Maness, 2006a). Such technologies have just created a new wave of technological applications in libraries, and also attracted the attention of researchers, scholars and the library community.

Maness (2006a) found that librarians are only beginning to acknowledge and write about Web 2.0, primarily in the form of weblogs. Also, according to Bradley (2007), King and Porter (2007), most of the writing about Web 2.0 and libraries either describes the potential use of Web 2.0 in the library, presents a case study of the use of one Web 2.0 tool in a library, or presents a 'how-to' guide for libraries to implement Web 2.0 applications. There is little research that focuses on the evaluation of Web 2.0 applications in the library, especially in the case of Australasian university libraries. It is likely that none of research provides information on what Australasian university libraries have done with Web 2.0 as well as the adoption, purposes and features of Web 2.0 in such libraries. Therefore, a survey that draws an overall picture of the application of Web 2.0 in Australasian university libraries

is necessary for not only library managers and librarians in applying Web 2.0 in their libraries, but also for information professionals and researchers to have an overview of the application of this technology in Australasian university libraries.

The above context has raised a research problem that is stated as follows:

To what extent is Web 2.0 used in Australasian university libraries?

This paper consists of six main parts: introduction, research objectives and research questions, literature review, research design, results and discussions, and conclusions.

2. Research objectives and research questions

The objectives of this research are as follows:

- Identify Web 2.0 technologies that are applied in Australasian university libraries
- Examine purposes of Web 2.0 use in the libraries
- Investigate features of the use of Web 2.0 in the libraries

To achieve the above objectives, this study has to answer the following research questions:

- What sort of Web 2.0 technologies have been applied in Australasian university libraries?
- For what purposes are these libraries using Web 2.0 technologies?
- What features (characteristics of content, navigation, appearance, organization, functionality, etc.) of Web 2.0 technologies appear in Australasian university libraries?

3. Literature review

3.1. General literature

Most of the early articles and discussions argue about the meaning of Web 2.0 and its applications. Web 2.0 can be defined in terms of its features and specific technologies, or social impact. O'Reilly (2005), the founder and CEO of O'Reilly Media Inc. generalizes "Web 2.0 is the Web as platform" and applications of Web 2.0 are based on that platform. In other words, Web 2.0 applications based on the Web (previous generation of Web or Web 1.0) to create a new communication environment. Meanwhile, in an attempt to explain the meaning of Web 2.0, two senior professionals of National Library of New Zealand (Macaskill, Manager of School Services Centre and Owen, National Adviser Schools Collection) consider Web 2.0 is a second wave that covers web tools and services such as weblogs, wikis, Ajax, RSS, and tagging. These allow web users to generate, describe, post, harvest, search, annotate and exchange online content in various forms ranging from music, bookmarks to photographs and documents (Macaskill and Owen, 2006).

In terms of social impact, Miller quotes the words of his colleague, a technologist, who describes "Web 2.0 is an attitude not a technology" (Miller, 2005) while Birdsall (2007), a library consultant, asserts that "Web 2.0 is a social movement". Besides these, Abram (2005), who is playing two roles as vice president of Sirsi Corporation and president of the Canadian Library Association, confirms that Web 2.0 is about a social phenomenon, not just about networked social experiences but about the distribution and creation of Web content itself. It is characterized by open communication, decentralization of authority, and freedom to share and reuse content. These three authors agree that Web 2.0 is not purely a technology.

In an article in *Library Technology Reports*, Stephens (2006a) also agrees that Web 2.0 is the next embodiment of the World Wide Web, where digital tools allow users to create, change and publish dynamic content of all kinds, while Miller (2005) believes people are hyping the Web 2.0 and Notess (2006) affirms there is nothing new by saying "the nebulous Web 2.0 concept represents a second wave of Web techniques to create more interactive and easy to use Web sites using new technologies (or using older technologies in a new way)".

It could be seen that the majority of the early literature defines and discusses Web 2.0 and its applications. The authors present their different viewpoints about Web 2.0 which is either as a technical issue or a social phenomenon. However, most of them agree that Web 2.0 is a new generation of Web that enables users to participate in processes of creating, exchanging and sharing information (O'Reilly, 2005; Miller, 2005; Birdsall, 2007); and Web 2.0 consists of a wide range of technologies and services such as Wikis, Weblogs, RSS, Ajax, Instant Messaging. Among them, RSS will be the mainstream in the next few years thanks to its simpleness when Web 2.0 is more strongly applied in different fields including the library (Notess, 2006; Stephens, 2006a; Macaskill and Owen, 2006).

3.2. Web 2.0 technologies and libraries

The majority of early literature about Web 2.0 appeared online, usually written by technologists and bloggers. Later publications are research based articles or books. Many recent publications are 'how-to' guides that help librarians to implement Web 2.0 applications (Bradley, 2007; Huffman, 2006; King and Porter, 2007). Some of them focus on different technologies and services of Web 2.0, most of them focus on only one or several of those in relation to the library.

Being newly published, a book by Bradley (2007) provides an insight about Web 2.0, new trends, services and opportunities for libraries. He mentions almost all aspects of Web 2.0 in the library. Bradley discusses a wide range of Web 2.0 technologies in the book such as RSS, Weblogs, Podcasts, Instant Messaging and other technologies. Besides this, Hanson and Cervone (2007) present practical guides in the book "Using interactive technologies in libraries: a LITA guide". Mentioning Web 2.0 in the library in a narrower but more detailed scope, the authors provide practical advice and detailed examples of Web 2.0. According to Hanson and Cervone, four major interactive technologies of Web 2.0 in the library are Wikis, Blogs, RSS, Instant Messaging and Podcasts. Many other authors also hold the same ideas (Maness, 2006b; Singer and Sherrill, 2007; Macaskill and Owen, 2006; Stephens, 2006a).

Single Web 2.0 technologies are also the focus of particular articles. Frumkin (2005) explains how Wikis can be utilized as a collaborative tool in the library and Achterman (2006) analyses the usage and benefits of Wikis in the library as a tool to improve information literacy. Chawner and Lewis (2006), Clyde (2005) and Stephens (2006b) analyse Wikis in relation to libraries. Stephens concentrates on the history, benefits and functions of Wikis while Chawner, Lewis and Clyde discusses basic and advanced Wiki features by describing case studies of real world library and library related Wiki applications. Besides this, Long (2006) examines Wikis as a new collaborative electronic platform available to all types of libraries and the author introduces potential application of Wikis for academic libraries.

Blog technology is also studied by a number of authors to different extents. Clyde (2004a) investigates a number of aspects relating to blogs such as the appearance of blogs, purposes of blogs, ways to find blogs and the applications of blogs in the library. The matters of building and managing a library blog are also discussed. More specifically, Clyde (2004b) conducts a content analysis research on how blogs are deployed in different types of libraries and explains why there are not many libraries using blogs effectively. Similarly, Stephens (2006e) analyses the potential of blogs for libraries and librarians. He also discusses the ways to identify various forms of blogs as well as the application of blogs for a wide range of library services. Specifically, Pomerantz and Stutzman (2006) explore the use of blogs as a platform for providing collaborative reference services. The authors also discuss technical issues of blogs and point out related matters of blogs in reference services. Meanwhile, Maxymuk (2005) surveys a number of library blogs and examines their content to determine their value and usefulness to librarianship.

RSS is also one of the Web 2.0 technologies that interests researchers. Wusteman (2004) analyses the emergence of RSS as an updating information tool. The author indicates

its potential for the library and asserts its importance for communication in libraries. A range of matters relating to RSS are discussed by Stephens (2006d) who presents the benefits of RSS and how to apply RSS in libraries. Also, Holvoet (2006) introduces an overview of RSS and clarifies the purposes of using RSS in libraries. The implementation of RSS in libraries is also specified by the author.

Stephens (2006c) surveys the usage of Instant Messaging as a technology for virtual reference services in libraries. Particularly, Foley (2002) conducts a case study on the use of Instant Messaging for reference services in an American academic library. A range of issues from implementation Instant Messaging and Instant Messaging software to administrative and staff training is analysed. Lee (2006) introduces Podcast as a technology for marketing library services. Other Web 2.0 technologies such as tagging or mashup seem to be of not much interest to the researchers as they are little discussed.

3.3. Web 2.0 in Australasian academic libraries

While many publications talk about Web 2.0 in general, the publications on this topic in Australasian academic libraries almost always focus on a single Web 2.0 technology. The MLIS research project by Perry (2007) focuses on the perceptions and usage of library instructional podcasts by students and staff at Universal College of Learning, New Zealand. McIntyre and Nicolle (2007) outline the use of blogs for the purposes of communication and knowledge management at the library of Canterbury University. In a case study, Goodfellow and Graham (2007) present their results of a study on the use of blogs as the communication tool for library staff at the library of Sydney University. In a broader context, Chawner (2007) conducts a survey on the usage and attitudes of New Zealand librarians towards Web 2.0.

Besides this, there are some pieces of research investigating New Zealand university library websites such as the usability evaluation on New Zealand university websites (Mankelow, 2004) and an evaluation of usability of New Zealand university library websites (Duong, 2005). However, they do not focus on Web 2.0 and its applications in the library but concentrate on evaluation of the usage, usability and the utilities of websites.

In general, the applications of Web 2.0 in libraries are mentioned, discussed and analysed at different levels. The library community has just begun applying this new technology in the library. As synthesized above, there are quite a lot of general publications on Web 2.0 or single Web 2.0 technologies. However, there is a little research-based literature that focuses on survey and evaluation of applications of Web 2.0 in Australasian academic libraries. Thus, there are still gaps in this area that are available for future research.

4. Research design

4.1. Research method

This research used content analysis that was used for the quantitative approach. In the past, “content analysis is used to identify and record the meaning of documents and other forms of communication in a systematic and quantitative way” (Allen and Reser, 1990). Recently, this method has been applied to modern technologies such as radio, television, Internet and websites (Salinas, 2006). McMillan (2000) surveys 19 studies that applied content analysis method to the Web, affirms that “content analysis can be effectively applied to a dynamic environment such as the Web”. Also, Krippendorff (1980) asserts that content analysis is context sensitive, accepts unstructured material, can process symbolic forms, and can deal with large volumes of data. The above characteristics and advantages of content analysis proved that it was suitable for this research.

4.2. Research sample

According to Australian Education Network (2007) and New Zealand Ministry of Education (2007), there are 39 universities in Australia and eight universities in New Zealand. Thus, the research population is 47 universities. The author decided to collect as large a sample as possible by the following method:

- Create a list of 47 Australasian universities (Adapted from the lists provided by Australian Education Network and New Zealand Ministry of Education)
- Access all library websites of Australasian universities in the list to identify the existence of Web 2.0 technologies
- Mark the libraries on the list that used any types of Web 2.0 technologies
- As a result, a subset of the whole research population was collected and made up a list of 32 university libraries (26 in Australia and 6 in New Zealand – see *Appendix*)

4.3. Development of research instrument

Due to the absence of generally accepted criteria or standards to evaluate Web 2.0 applications in the library and the fact that Web 2.0 is a set of different technologies, the researcher had to develop his own research instrument. This instrument in form of a checklist was used to collect data for the research.

The development of the checklist was adapted from and based on various checklists, questionnaires, and synthesized ideas from literature. The checklist was based primarily on the usability evaluation of library websites (Keevil, 1998) and the list of checkpoints for Web content accessibility guidelines 1.0 (W3C, 1999). Design of content of the checklist was based on a questionnaire to evaluate perceptions and usage of library podcasts (Perry, 2007), and a questionnaire to study the use of blogs for library communication (McIntyre and Nicolle, 2007).

Basically, the checklist consists of check points (questions) along with alternative answers (Y=Yes=1, N=No=0) and the list of university libraries that apply any types of Web 2.0 technologies. The checkpoints in the checklist are not 'standards' developed by International Organization for Standardization (ISO) or a professional organization. They are a list of features and criteria that emerged from the content analysis of literature on Web 2.0 in libraries, and from checklists and questionnaires as mentioned above.

The researcher invited a student at Monash University who is familiar with applications of Web 2.0 in the library to test the checklist for the consistency and validity. The student and the researcher carried out an independent survey on three library websites (University of Queensland library, Swinburne University library and Canterbury University library), and filled in the checklist. Then, the results were compared for the consistency and validity.

4.4. Gathering data

The data were collected twice within two weeks. The first time was finished between 23 and 30 December, 2007. The second time was done from 31 December, 2007 to 6 January, 2008. The whole process of gathering data was done similarly in both times. The second time was a repeat of the first one in order to avoid omitting necessary data and to update changes of the websites. To identify the existence of Web 2.0 technologies, the following steps were implemented:

- Access all libraries' websites of Australasian universities, look at links such as 'news', 'new titles', 'library communication', 'library services', etc. to see the availability of RSS, blogs, IM, Podcasts and Wikis. Such links are usually on the home pages or the second-level sub-pages (direct links from the home pages) of the library websites.

Either the number '1' or '0' was filled in the corresponding cell on the checklist (see *Appendix*).

- Use 'search' function of the websites. Almost all websites of Australasian university libraries provide search boxes that allow users to search for words or phrases such as 'RSS', 'Blog', 'Library blog', 'Instant Messaging', 'Chat', 'Podcast', 'Vodcast', 'Wiki' and 'Tag'. This step is useful as it enabled the researcher to identify the availability of Web 2.0 in the libraries' websites even if the links to those applications are not in the home pages or the second-level sub-pages of the websites.
- Use 'Google search' for libraries that do not provide a search box on their websites to search within the libraries' website domain by following the syntax: *keyword site:www.domainname*. For example, to see whether the library of Flinders University uses RSS or not, the following search expression was used: *RSS site:www.lib.flinders.edu.au*. The first 10 links in the search results usually provided the answers.
- Use 'Google search' to search for the libraries' blogs that hosted by free domain names instead of the libraries' domain names. By doing this step, a number of blogs were found such as blogs of Canterbury University library, Queensland University of Technology library, University of Sydney library and Southern Cross University library.

4.5. Data analysis

Based on data collected from the checklist, statistical techniques were used to analyse data. The checklist was converted in to Microsoft Excel spreadsheets. Each checkpoint in the checklist was assigned a value either 1 or 0 (Yes or No answers). These values were input directly in a spreadsheet and then the 'SUM' function of Excel was used to calculate the overall weighting, types, purposes and features of Web 2.0 technologies in the libraries. The 'Application index' of each university library was calculated by the following formula:

Application index = Total of 'Yes' answers / Total of checkpoints x 100

Thus, the maximum application index of each library is 100. An application index represents the degree of adoption of Web 2.0 application in a specific library. The overall application index of all libraries was illustrated by a table that made it easy to see the differences in the applications of Web 2.0 among libraries.

5. Results and discussions

5.1. General Web 2.0 application indexes

Table1: General Web 2.0 application indexes in Australasian university libraries

Rank	Libraries	Application indexes
1	Curtin Univ. of Technology Library	37
2	La Trobe Univ. Library	36
3	Swinburne Univ. Library	31
4	Canterbury Univ. Library	30
5	Southern Cross Univ. Library	27
6	Queensland Univ. Library	26
7	Charles Sturt Univ. Library	25
8	Univ. of Melbourne Library	24
9	Univ. of Sydney Library	23
10	Univ. of South Queensland Library	23
11	Auckland Univ. Library	23
12	Univ. of Newcastle Library	21
13	Ballarat Univ. Library	20
14	Univ. of Notre Dame Library (Australia)	19
15	RMIT Univ. Library	19
16	Library of Queensland Univ. of Technology	19
17	Univ. of Technology Sydney Library	18
18	Massey Univ. Library	17
19	Monash Univ. Library	15
20	University of New England Library	14
21	Univ. of South Australia Library	14
22	Murdoch Univ. Library	13
23	Victoria Univ. Library (Melbourne, Australia)	11
24	Otago Univ. Library	11
25	Univ. of Western Sydney Library	10
26	Flinders Univ. Library	8
27	Australia National Univ. Library	8
28	Adelaide Univ. Library	8
29	Waikato Univ. Library	6
30	New South Wales Univ. Library	6
31	Lincoln Univ. Library	4
32	Bond Univ. Library	3
Total of indexes		568

The mean of Web 2.0 application indexes in Australasian university libraries

Table 1 shows a general evaluation by presenting the Web 2.0 application index of each university library and the total of indexes of 32 Australasian university libraries. The mean of Web 2.0 application indexes is calculated by the following formula:

$$\text{Mean application index} = \text{'Total of indexes'} / \text{'Number of Australasian university libraries'}$$

$$\Rightarrow \text{Mean} = 568 / 47 = \mathbf{12}$$

Thus, the mean of Web 2.0 application indexes in Australasian university libraries is approximately 12 points that is expressed by the bold line in **Table 1**. Above the bold line are the university libraries that have higher indexes in comparison to the mean and vice versa. The libraries were ranked in descending order of the application indexes. As can be seen from the table, the library of Curtin University of Technology gained the highest application index with 37 points while the library of Bond University had the lowest one with only 3 points. Besides, 15 university libraries without Web 2.0 applications (or Web 2.0 application indexes are equal to zeros) are not displayed in the table.

In comparison to the mean index (12), nearly a half of the libraries (47 %) which used Web 2.0 gained the mean index or higher (22 libraries), whilst over a half (25 libraries) had under the mean index. Those libraries which were under the mean index, either applied only one Web 2.0 (normally RSS) or applied two Web 2.0 technologies for some simple purposes (library news and new books). Three New Zealand university libraries had an under mean

index (Lincoln, Otago and Waikato) and the other three gained the higher indexes compared to the mean index (Canterbury, Auckland and Massey).

5.2. Types of Web 2.0

Figure 1: Types of Web 2.0 used in Australasian university libraries

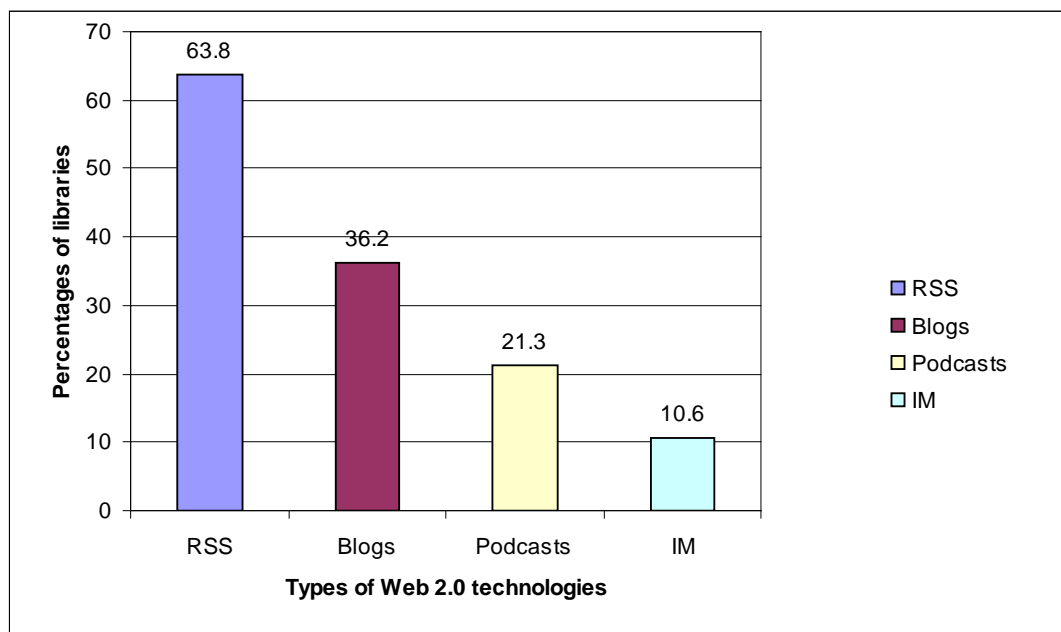


Figure 1 shows the types of Web 2.0 technologies employed in Australasian university libraries. Only four Web 2.0 technologies (RSS, Blogs, Instant Messaging and Podcasts) were used. It is clear from the figure that approximately 64 % of the libraries applied RSS (30 out of 47 libraries). Among 32 libraries used Web 2.0 technologies, only 2 libraries did not have RSS (Charles Sturt and Massey University libraries). RSS was also the most commonly used technology while IM was the least used one with only five libraries (10.6 %). The popularity of RSS may be due to its clear function, simplicity and easiness. As Stephens (2006d) affirms, RSS has been one of the most utilized technologies as it enables users to create a one-stop-shop of information. Users can easily and flexibly subscribe to information that meets their needs. On the contrary, IM was the least used even though it is a good technology for the library to implement virtual reference services. The reason is that such a technology requires librarians to be always online to support users. Therefore, some libraries possibly did not employ it because of a lack of library staff.

More than a third of libraries (17 out of 47 - accounted for 36.2 %) utilized Blogs and less than a fifth of libraries (10 libraries – 21.3 %) employed podcasts. Blogs were the second most common used Web 2.0 technology in Australasian university libraries because of its benefits. According to McIntyre and Nicolle (2007), some notable advantages of Blogs are that libraries can use cheap or free software, and blogs require a minimal maintenance and staff's time. Additionally, blogs allow library users to freely exchange ideas on different library topics that traditional publications or services can not offer. Besides, the number of libraries that used podcasts is modest. The reason possibly is podcasts require libraries to have sound recorders, accompanying equipment as well as soundproof rooms. Also, the audio files are normally quite large for users to download or listen to online. Due to the fact that to keep audio files in a reasonable size (downloadable), the content of podcasts was normally short and focused on some specific library topics

According to the results, Wikis were not used by any Australasian university libraries. The reason is that Wikis possibly were deployed as a tool for internal communication among staff in the libraries so they did not appear on the public websites of the libraries. Another

reason is that some of Wikis' drawbacks were still barriers for libraries to deploy. According to Chawner and Lewis (2006), while simplicity and flexibility of Wikis are useful in various context including libraries, WikiSpam is a major problem for fully open Wikis as this usually contains unwanted links such as commercial or pornographic sites. On the other hand, Wikis require members monitoring and they also require mechanisms to protect Wikis from WikiSpam. Furthermore, the lack of a standard for Wiki content markup also causes a number of problems in creating, managing and editing Wikis. Meanwhile, Blogs is a quite simple and easy to implement as discussed above and they may be an alternative of Wikis. The popular use of Web 2.0 technologies based on the simplicity, easy to use, minimum investment of technical and human resources.

5.3. Purposes of the use of Web 2.0

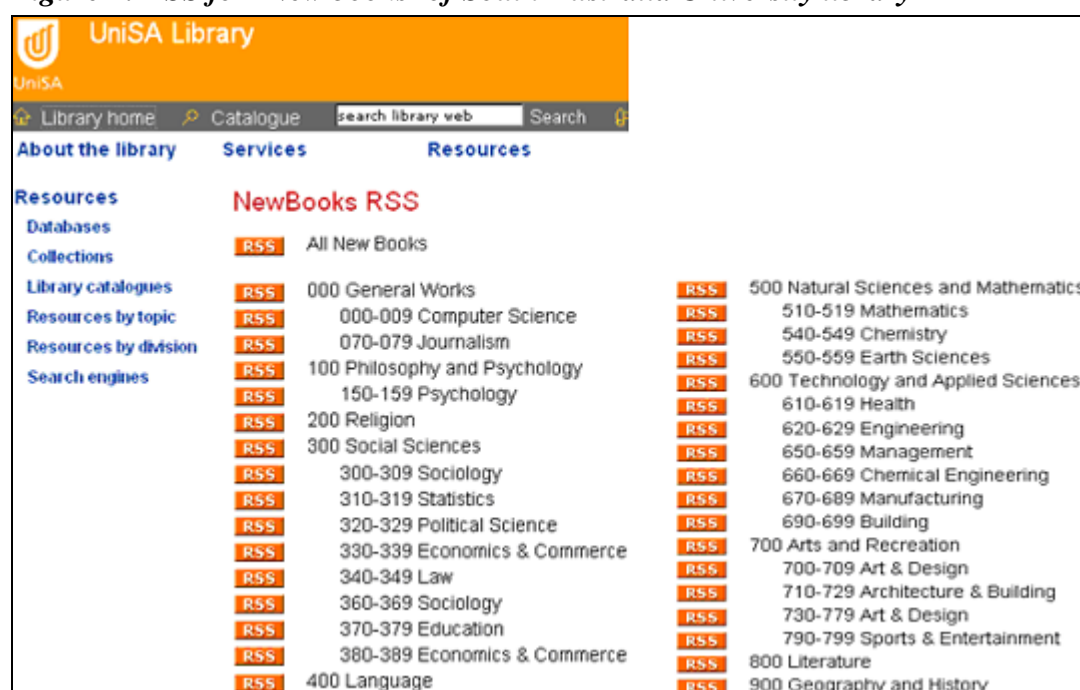
5.3.1. Purposes of RSS

Table 2: Purposes of RSS use

No.	RSS was used for	No. of libraries using RSS for this purpose	Percentage of total libraries using RSS for this purpose
1	New books?	25	53.2
2	New e-journals?	22	46.8
3	Library news and events?	22	46.8
4	New databases?	20	42.6
5	Others?	15	31.9
6	University news?	12	25.5
7	General news?	10	21.3
8	Custom catalogue search?	1	2.1

Table 2 provides the number of libraries that used RSS for different purposes. The primary purpose of RSS was 'New books' (25 libraries used – accounted for 53.2 %). Most of these libraries used RSS for new books in specific fields, subjects or branch libraries. Only few of them used RSS for all new books (New South Wales University library categorised new books feeds according to the research fields and courses). Also, South Australia University library used RSS for all new books of the library and RSS feeds were categorized in Dewey Decimal Classification (see **Figure 2**) that made it very convenient for users.

Figure 2: RSS for 'New books' of South Australia University library



Less than a half of libraries applied RSS for ‘New e-journals’, ‘Library news and events’ and ‘New databases’. However, these were still important purposes as they were deployed by many libraries.

Not many libraries used RSS for ‘General news’ and ‘University news’ because users can subscribe to the university news directly from the university websites. Similarly, users can access freely news websites such as BBC, CNN for general news without depending on libraries.

‘Custom catalogue search’ feed is a subset of ‘New books’ or ‘New journals’ feeds that defines a specific set of new items being input into the library catalogue systems. This is very useful for users to keep up-to-date with new items in libraries based on their defined search expressions (the searches that are implemented previously). However, it was not widely used by libraries. The only library which used RSS for ‘Custom catalogue search’ was Charles Sturt University. Specifically, it was used by Law library (a branch of Charles Sturt University library) to feed table of contents of law journals.

Besides the above purposes, some libraries used RSS for ‘other’ purposes such as new website introduction and new library staff (University of Queensland University), institutional repository (Lincoln University library), newsletters (Flinders University), notices on nearly due items, overdue items and availability of inter-loan items (Queensland University of Technology library).

5.3.2. Purposes of Blogs

Table 3: Purposes of Blogs use

No.	Blogs were used for	No. of libraries using Blogs for this purpose	Percentage of total libraries using Blogs for this purpose
1	Library services?	16	34.0
2	Library news and events?	16	34.0
3	Research tools?	14	29.8
4	New Books?	14	29.8
5	Others?	12	25.5
6	Information literacy?	5	10.6
7	General information?	5	10.6
8	Suggestions?	3	6.4
9	Book reviews?	3	6.4
10	Book discussions?	0	0.0

Table 3 shows the list of purposes of blogs use. More than a third of libraries (34 %) used blogs for ‘Library services’ and a similar percentage of libraries used blogs for ‘Library news and events’. These were the two main purposes of blogs that enabled library users to be aware of library services such as opening hours, borrowing services, and questions and answers relating to library services. As discussed above, many libraries used RSS for ‘Library news and events’. Thus, ‘Library news and events’ is one of the main purposes of Web 2.0 application.

Nearly 30 % of libraries used blogs for ‘New books’ and also 30% used blogs for ‘Research tools’. Libraries might prefer RSS for ‘New books’ to Blogs as 53.2 % of libraries using RSS vs. 30 % of libraries used Blogs for this purpose. Possibly, library users normally required to know what new books were in the libraries instead of looking for comments on new books. Besides, ‘Research tools’ were used for discussions on citation rules, Endnote software and other issues relating to research.

Only 10.6 % of libraries used blogs as a tool for ‘Information literacy’ and ‘General information’. ‘Information literacy’ usually focused on library courses and seminars in order to help library users to improve their searching, studying and information skills. Besides this,

‘General information’ was normally organized in ‘Websites’ or ‘Links’ category that led users to Internet sources.

‘Book reviews’ and ‘Suggestions’ were not common purposes of the library blogs. Some libraries used blogs for book reviews such as Curtin University library, University of Queensland library and University of Sydney library. Massey and Curtin University libraries also had categories in their blogs for users to suggest new ideas in order to improve library services.

Apart from the above purposes, some libraries used blogs for other purposes and services such as research and study tips (blogs of La Trobe, Canterbury and Charles Sturt University libraries), information services for Maori staff and students (blogs of Massey University library).

5.3.3. Purposes of Podcasts use

Table 4: Purposes of Podcasts use

No.	Podcasts were used for	No. of libraries using Podcasts for this purpose	Percentage of libraries using Podcasts for this purpose
1	Advice on library skills?	10	21.3
2	Guidance with resources?	9	19.1
3	Library orientation tours?	7	14.9
4	Using research tools?	6	12.8
5	Others?	6	12.8
6	General searching skills?	6	12.8
7	Searching the library catalogue?	5	10.6
8	Study skills workshops?	1	2.1
9	Library news?	1	2.1
10	Book reviews?	1	2.1
11	General information?	0	0.0

As **Table 4** shows, the top three purposes of podcasts were ‘Advice on library skills’, ‘Guidance with resources’ and ‘Library orientation tours’. It is notable that these are not easy to present in text or other media. Therefore, audio files (podcasts) are one of good ways to help library users be familiar with general library skills, library resources and library environment. Audio files are usually large hence library podcasts did not focus on purposes/services that can be presented by other Web 2.0 technologies (Blogs, RSS). As a result, not many library podcasts were used for ‘Library news’, ‘Book reviews’ and ‘Study skills workshops’. Also, there were no podcasts for ‘General information’ because users could look for such information in news websites.

Some libraries used podcasts as step-by-step guidance for library users to search for information on the Internet or library catalogues. Podcasts were also used to give guidance on research tools (Swinburne University library, La Trobe University library). Podcasts are useful because they do not require users to read a number of pages. Instead, they listen to podcasts and follow instructions.

Some libraries used podcasts for other purposes such as introducing library services for distance students and special library services for people with disability (Southern Cross and RMIT University libraries). Such podcasts are very useful for visually disabled people.

5.3.4. Purposes of Instant Messaging use

Table 5: Purposes of IM use

No.	IM was used for	No. of libraries using IM for this purpose	Percentage of total libraries using IM for this purpose
1	Reference services?	5	10.6
2	Guidance with resources?	4	8.5
3	Advice on library services?	3	6.4
4	Others	2	4.3

Table 5 presents the purposes of IM use. It is clear that IM was mostly used as a tool for virtual reference services in terms of chat services. According to Stephens (2006c), IM is an integral tool for reference services and at least 75 % American libraries use IM for their reference services. However, as **Figure 1** shows, IM was the least used in comparison with other Web 2.0 technologies. Only 10.6 % of Australasian university libraries used IM for reference services. Modest numbers of libraries used IM for other purposes such as ‘Guidance with resources’ and ‘Advice on library services’ (8.5 % and 6.4 %, respectively). IM was also used for consultation about assignments and guidance on using research tools (University of South Australia library). As presented above, all chat services in Australasian university libraries require users to login before using the services. Therefore, the research could only carry out a survey on this service based on its introduction and instructions.

5.4. Features of Web 2.0 applications

5.4.1. Features of RSS

Table 6: Features of RSS

No.	Features of RSS	No. of libraries with this feature	Percentage of libraries with this feature
1	Provide links to websites offering RSS reader function?	18	38.3
2	Provide links to download RSS readers?	17	36.2
3	News is classified into topics?	17	36.2
4	Adequacy of instructions on how to use RSS?	16	34.0
5	News is searchable?	5	10.6
6	Library builds its own RSS reader?	0	0.0

Table 6 shows typical features of RSS in Australasian university libraries. Most of the libraries (using RSS) either provided links to websites offering RSS reader function (18 libraries – 38 %) or provided links to download RSS readers (17 libraries – 36.2 %). These were very helpful for library users, especially new users who were not familiar with RSS readers. Some libraries did not provide such help for users such as library of University of New England and Swinburne University library.

The “Adequacy of instructions on how to use RSS” is also important as it enabled users to easily subscribe to RSS feeds of libraries. This feature was measured by the availability of explanation on what RSS is, how to find RSS feeds in library websites and how to subscribe to an RSS feed. Approximately a third (34 %) of libraries provided sufficient information.

Just over a third (36.2 %) of libraries classified news (RSS feeds) into topics and sub-topics, so library users could easily subscribe to a specific RSS feed. As discussed above, some libraries classified RSS feeds for new books by DDC scheme (South Australia University and University of Melbourne libraries) and other libraries classified RSS feeds by types of materials (New books, new e-journals, new databases, etc.).

All libraries' RSS feeds could be freely subscribed to by all types of users except Queensland University of Technology. This library required users to login before they could subscribe to specific RSS feeds that the library offered.

5.4.2. Features of Blogs

Table 7: Features of Blogs

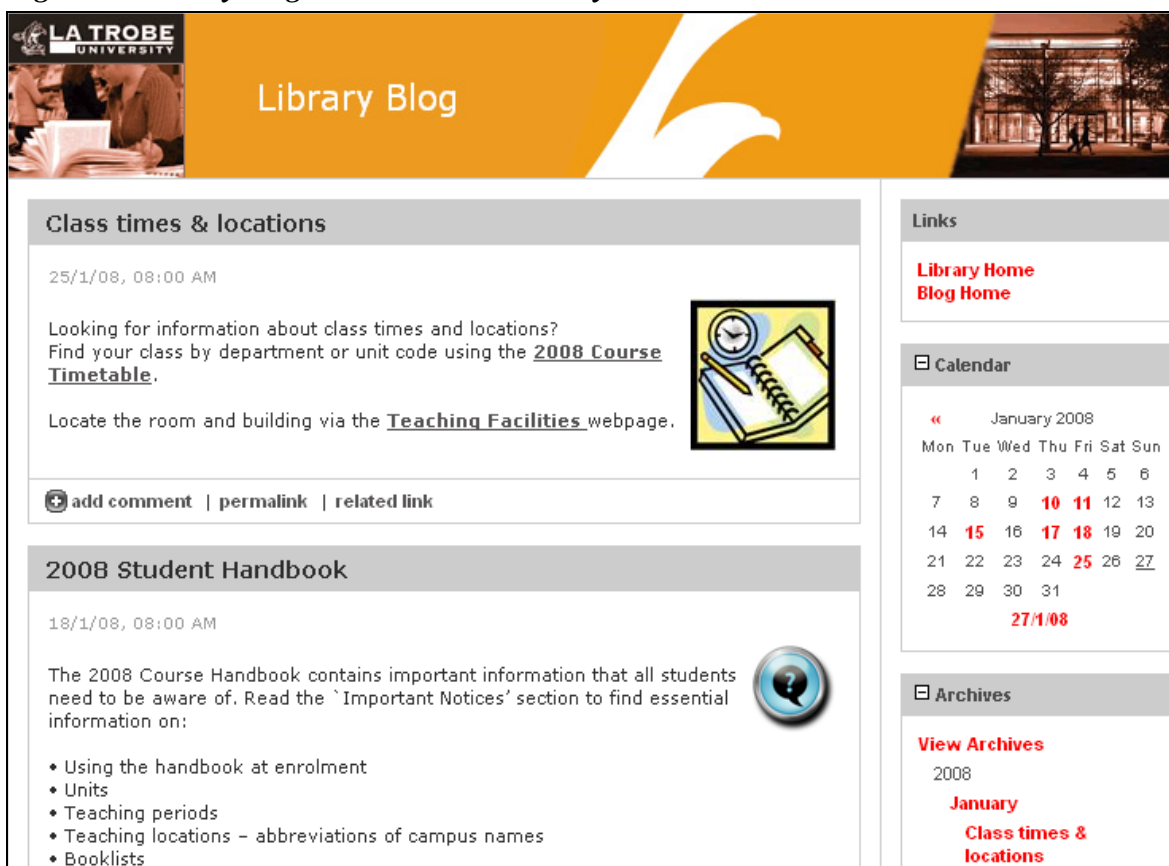
No.	Features of blogs	No. of libraries with this feature	Percentage of libraries with this feature
1	There are categories for postings?	17	36.2
2	There are archives for the blogs	17	36.2
3	Library uses RSS to feed blogs' entries?	16	34.0
4	Entries are browsable by topics?	16	34.0
5	Entries are browsable by date?	16	34.0
6	Link to the library's home page?	15	31.9
7	Entries are searchable by keywords?	10	21.3
8	There are dates and times of postings?	9	19.1
9	Archival entries are up to 1 year?	9	19.1
10	Library designs its own blogs?	8	17.0
11	The latest postings are within the last 2 days?	7	14.9
12	There are links to the relevant Internet resources?	5	10.6
13	Archival entries are more than 1 year?	5	10.6
14	There are links to similar blogs?	4	8.5
15	Adequacy of instructions on how to use Blogs?	0	0.0

There was a wide range of blogs in Australasian university libraries. Some libraries had only one blog while others had two to five. Some had only one blog for all library users while others might have different blogs for different groups of users. The following examples show the diversity of blogs:

- Based on academic majors, types of branch library and mode of training, University of Queensland library had five blogs: business and economics students and staff's blog, external students' blog, Law library blog, Health Sciences Library Service News blog, Biological Sciences Library blog. Similarly, Library of Massey University had four blogs: EndNote blog (for EndNote users), News for the College of Business blog, Science News from Massey University blog, and Maori Services blogs (for Maori students and staff). Also, Auckland University library had four blogs: education blog, history blog, information commons blog and science blog.
- Likewise, Canterbury University library had only one blog for Engineering Library (one out of 6 branch libraries), Southern Cross University library had one blog for Coffs Harbour Education Campus Library (one out of three branch libraries), and University of Sydney library had one blog for social researchers and students.

Table 7 gives the list of Australasian University library blogs' features. The majority of blogs were administered by liaison librarians and used free-based blog services such as Bloglines, Wordpress and Blogspot. Some libraries designed their own blogs (La Trobe, Swinburne, Ballarat and Auckland University libraries). The overall design of blogs of these libraries was quite good as they comprised most of the key features of a good blog. **Figure 3** is an example of a library blog that was created by La Trobe University library.

Figure 3: Library blog at La Trobe University



A noticeable point is that all of 17 library blogs had categories and archives for postings. Sixteen library blogs used RSS to feed Blogs' entries, and entries were browsable by topics and date. These features were useful for users to retrieve information in the blogs.

Also, 15 library blogs had a link to the library home pages (31.9 %). All of these blogs were linked from the library home pages. The only two blogs that did not have a link to their library home pages were blogs of Queensland University of Technology and University of Sydney libraries. The links to the blogs of these two libraries were also not in the home pages of the libraries but in sub-pages; therefore, it was not easy for users to find the blogs and these blogs were operated quite separately from the library websites.

Not many library blogs had links to relevant Internet resources and/or to similar blogs (only 10.6 % and 8.5 %, respectively). Possibly, the nature of blogs is two ways communication (a member post a piece of information and others can comment on it); therefore, most of the library blogs did not provide links to other Internet resources and similar blogs. Such links are normally found on other pages of the library websites (e.g. news and events pages) and users can only read but can not give their comments (one way communication).

Table 7 indicates that most of the postings in the library blogs were created quite recently. Nine library blogs (19.1 %) had archival entries up to one year; only five of them (10.6 %) had archival entries longer than one year, and the rest had archival entries within a few months. Also, there was a lack of regular update in the library blogs. Only seven blogs (14.9 %) were updated (having new postings) within 2 days. The rest of blogs were normally updated within one week or even longer.

There was an absence of instructions or guidance on how to use blogs. None of the 17 blogs had such information. It would be useful if library blogs provided information on rights and limitation of blog users, how to create a new entry, how to reply/make a comment because not all library users could be familiar with such issues, especially new users.

5.4.3. Features of IM

Table 8: Features of IM

No.	Features of IM	No. of libraries with this feature	Percentage of libraries with this feature
1	Library offers text-based chat?	5	10.6
2	Adequacy of instructions on how to use Instant Messaging?	2	4.3
3	Instant Messaging services are available 8 hours a day?	1	2.1
4	Library offers voice chat?	1	2.1
5	Instant Messaging services are available more than 8 hours a day?	0	0.0

Table 8 displays five features of Instant Messaging in Australasian University libraries. Owing to the nature of Instant Messaging technology, some features of IM could not be surveyed. ‘Text-based chat’ was offered by five libraries (10.6 %) while only one library offered ‘Voice chat’ (University of Western Sydney). The number of libraries that offered voice chat in reality might be higher. However, all five libraries allowed only their members (students and staff) to use the chat services. Therefore, an overall evaluation of IM could not be done because of the lack of authorized access.

The total time that libraries made IM available for virtual reference services was normally short. Only one library made this service available up to eight hours per day (Murdoch University library) and no libraries offered more than eight hours. Typically, most libraries opened this service from three to five hours per day (during semesters/trimesters) and closed in summer break. Thus, the services were not always available during the opening time of the libraries. This was because they required librarians to be always available and ready to answers users’ questions.

According to the results, 2 libraries provided sufficient instructions on how to use IM in their libraries. University of South Australia library provided a users’ guide that contained information on different issues such as who can use the chat service, types of valid questions and how to configure chat programs as well as technical support information. University of Canterbury library presented detailed explanation on how to configure Internet browsers to use the chat service and provided solutions for potential technical issues.

5.4.4. Features of Podcasts

Table 9: Features of Podcasts

No.	Features of Podcasts	No. of libraries with this feature	Percentage of libraries with this feature
1	Library uses RSS to feed Podcasts?	6	12.8
2	Adequacy of instructions on how to use Podcasts?	6	12.8
3	A transcript accompanies each podcast?	5	10.6
4	Archival Podcasts are up to 1 year?	2	4.3
5	Podcasts are browsable by topics?	1	2.1
6	Podcasts are searchable by keyword?	0	0.0
7	Podcasts are browsable by date?	0	0.0
8	Archival Podcasts are more than 1 year?	0	0.0

Due to the fact that podcasts were applied to a limited number of topics and because of features of audio files, not many podcasts were available on Australasian university library websites. Some libraries had a low number of podcasts such as University of Sydney library (only 3 podcasts). Other libraries had modest numbers (around 20 - 40) even though they had employed podcasts for a year.

Podcasts searching and browsing functions were almost absent from the libraries. Only Curtin University library allowed users to browse podcasts by topics and there were no libraries offered browsing by date or searching by keywords or titles. This was because of the limited number of podcasts available.

As can be seen from **Table 9**, the majority of podcasts recently appeared on the library websites. Only two libraries had archival podcasts up to one year (Curtin University and Charles Sturt University libraries). This technology was lately deployed probably because it required accompanying equipment and it had large audio files.

Six libraries (12.8 %) used RSS to feed their podcasts and same number of libraries provided sufficient instructions on how to use podcasts. The use of RSS to feed podcasts is a good idea as it keeps users up-to-date with current information in the libraries. Instructions are necessary for podcasts users to easily take advantage of podcast in the libraries.

Similarly, the availability of accompanying transcripts for podcasts made it easier for library users to comprehend new information and it gave users more options in using podcasts. For example, a transcript accompanying a podcast on how to use the library (library orientation tour) could help new library users (especially new international students for whom English is not the mother language) to understand the content of the tour. Also, Users could read accompanying transcripts instead of listened to podcasts as some people still have dial-up connection to the Internet. Some libraries (such as La Trobe, Murdoch and RMIT universities) provided corresponding transcripts to podcasts.

6. Conclusions

It could be seen that at least two third (32 out of 47) Australasian university libraries deployed one or more Web 2.0 technologies. However the general Web 2.0 application indexes were still low as the mean application index was 12 points and the highest index was 37 points. Among Web 2.0 technologies utilized by Australasian university libraries, RSS was the most widely applied technology and Instant Messaging was the least used technology. Web 2.0 technologies were mainly applied for some specific purposes. Similarly, each Web 2.0 technology appeared on the library websites with basic features.

This research draws an overall picture of the application of Web 2.0 in Australasian university libraries. It attempts to provide Australasian university libraries with helpful information to better meet their user needs by effectively applying Web 2.0. Also, other university libraries can also learn from what Australasian university libraries do in applying Web 2.0. Additionally, library managers, librarians and other university libraries may also find this research beneficial as they plan to deploy Web 2.0. Furthermore, researchers and information professionals may also find this research useful once they intend to do research relating to Web 2.0 in libraries.

However, due to geographic barriers, this research could not employ other research methods other than content analysis. It could be useful if future research combines different methods such as content analysis, survey, interview and/or case studies as these methods can collect ideas/opinions of librarians and library users that would gave different perspectives. Such methods may investigate other aspects of Web 2.0 technologies in the library.

Further research in a similar area may have a wide range of choices. An evaluation or a survey on Web 2.0 applications in public libraries that focuses on some specific groups of users may be a potential issue for exploring. Also, the application of Web 2.0 in professional organizations such as regional and national library associations is also another interesting topic for further analysis. Some Web 2.0 technologies appear to be intended for communication with a specific audience like the professional library community. An investigation to see if librarians can take advantage of information communicated via Web 2.0 applications may be a potential area for future research.

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Appendix: Evaluation checklist

No.	CHECK POINTS	Australia National Univ. Library	Curtin Univ. of Technology Library	Monash Univ. Library	Univ. of Melbourne Library	Univ. of Queensland Library	Queensland Univ. of Technology Library	Victoria Univ. Library	Bond Univ. Library	Charles Sturt Univ. Library	Flinders Univ. Library	La Trobe Univ. Library	Murdoch Univ. Library	RMIT Univ. Library	Southern Cross Univ. Library	Swinburne Univ. Library	Adelaide Univ. Library	Ballarat Univ. Library	University of New England Library	New South Wales Univ. Library	Univ. of Newcastle Library	Notre Dame Univ. Australia Library	Univ. of South Australia Library	Univ. of South Queensland Library	Univ. of Sydney Library	Univ. of Technology Sydney Library	Univ. of Western Sydney Library	Auckland Univ. Library	Canterbury Univ. Library	Massey Univ. Library	Lincoln Univ. Library	Otago Univ. Library	Waikato Univ. Library		
	Answers (Y=Yes=1, N=No=0)	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
CATEGORY 1 - WEB 2.0 USE																																			
1	Does the library use any types of Web 2.0 technologies?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2	Does the library use Wikis?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Does the library use RSS?	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	
4	Does the library use Blogs?	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0	0	
5	Does the library use Instant Messaging?	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	
6	Does the library use Podcasts?	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	
7	Does the library use Vodcasts?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Does the library use Tagging?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	Does the library use Mashups?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

CATEGORY 2 - RSS USE																																		
Purposes of RSS use																																		
10	General news?	1	0	1	1	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0				
11	University news?	0	1	1	1	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	1	0	0	1	0			
12	Library news and events?	0	1	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1		
13	New books?	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1		
14	New e-journals?	0	0	1	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	
15	New databases?	0	0	0	1	1	0	0	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	
16	Custom catalogue search?	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	Others?	1	0	1	1	1	1	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1		
Characteristics of the library RSS																																		
18	Adequacy of instructions on how to use RSS?	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	1	0	1	1	1	0	0	0	1	0	0	0	1	0	
19	Provide links to download RSS readers?	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0	1	1	0	1	0	1	1	1	0	0	0	1	0	0	0	1	0	
20	Provide links to websites offering RSS reader functions?	1	1	1	1	1	1	1	0	0	0	1	0	1	1	0	1	1	0	1	0	1	1	1	0	0	0	1	0	0	0	1	0	
21	Library builds its own RSS readers?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	News is classified into topics?	1	1	1	1	1	0	1	0	0	0	1	0	1	0	1	1	1	0	1	0	0	1	1	0	0	0	1	0	0	1	1	0	
23	News is searchable?	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
CATEGORY 3 - BLOGS USE																																		
Purposes of Blogs use																																		
24	General information?	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	
25	Library news and events?	0	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0	
26	Library services?	0	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0	
27	New Books?	0	0	0	1	1	1	0	0	1	0	1	0	0	1	1	0	0	0	0	1	1	0	1	1	1	0	0	1	1	0	0	0	
28	Book reviews?	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
29	Book discussions?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

30	Information literacy?	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	
31	Research tools?	0	1	0	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	0	0
32	Suggestions?	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
33	Others?	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0
	Characteristics of the library Blogs																																
34	Adequacy of instructions on how to use Blogs?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
35	Library designs its own blogs?	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0
36	Library uses RSS to feed blogs' entries?	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	0	0	0	0
37	Link to the library's home page?	0	1	0	1	1	0	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	0	1	0	1	1	1	0	0	0
38	There are dates and times of postings?	0	1	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0
39	There are categories for postings?	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0
40	There are archives for the blogs	0	1	0	1	1	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0
41	The latest postings are within the last 2 days?	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0
42	There are links to the relevant Internet resources?	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	There are links to similar blogs?	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
44	Entries are searchable by keywords?	0	1	0	1	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0
45	Entries are browsable by topics?	0	1	0	1	0	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0
46	Entries are browsable by date?	0	1	0	1	0	1	0	0	1	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0
47	Archival entries are up to 1 year?	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	1	0	0
48	Archival entries are more than 1 year?	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0
	CATEGORY 4 - PODCASTS USE																																
	Purposes of Podcasts use																																
49	Library orientation tours?	0	1	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0

50	General searching skills?	0	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
51	Searching the library catalogue?	0	1	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
52	General information?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
53	Advice on library skills?	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
54	Study skills workshops?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
55	Using research tools?	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
56	Guidance with resources?	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
57	Library news?	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
58	Book reviews?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
59	Others?	0	1	0	0	0	0	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Characteristics of the library Podcasts																																								
60	Adequacy of instructions on how to use Podcasts?	0	1	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
61	Podcasts are searchable by keyword?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
62	Podcasts are browsable by topics?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	Podcasts are browsable by date?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	Archival Podcasts are up to 1 year?	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	Archival Podcasts are more than 1 year?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	Library uses RSS to feed Podcasts?	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	A transcript accompanies each podcast?	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CATEGORY 5 – INSTANT MESSAGING USE																																								
	Purposes of Instant Messaging use																																								
68	Reference services?	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0		
69	Advice on library services?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	

70	Guidance with resources?	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0
71	Others	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
	Characteristics of the library Instant Messaging																																
72	Adequacy of instructions on how to use Instant Messaging?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	
73	Library offers text-based chat?	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	
74	Library offers voice chat?	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
75	Instant Messaging services are available 8 hours a day?	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
76	Instant Messaging services are available more than 8 hours a day?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	CATEGORY 6 – WIKIS USE																																
	Purposes of Wikis use																																
77	Subject guides?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
78	Project planning?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
79	Policy manuals?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
80	Resource listings?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
81	Training resources?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
82	Others?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Characteristics of the library Wikis																																
83	Adequacy of instructions on how to use Wikis?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
84	Allow users to create a new page?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
85	Library designs its own wikis?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
86	Allow users to edit an existing page?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
87	Provide tools to format text and images?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

88	Enable users to upload files?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	Have a history page?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
90	Users can recall, reedit and restore a previous page?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
91	Provide RSS feeds for new and updated information?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
92	Provide keyword search engine?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
93	Link to the library's home page?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
94	Require users to register?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
95	Have statement about copyright and content ownership?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total of "Yes" answers:		9	41	17	27	29	21	12	3	28	9	40	14	21	30	34	9	22	16	7	23	21	15	25	26	20	11	26	33	19	4	12	7
Application index:		8	37	15	24	26	19	11	3	25	8	36	13	19	27	31	8	20	14	6	21	19	14	23	23	18	10	23	30	17	4	11	6

This checklist has 95 questions in total

Application index = Total of 'Yes' answers / Total of checkpoints x 100