Enhanced Library Database Interface at NTU Library

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Abstract

This project sought to develop an integrated framework for managing the subscribed databases of the Nanyang Technological University Library (NTU Library). It aimed to provide a single workflow for the administration of the subscribed databases and information web pages, as well as to provide a modern and intuitive end-user interface for library patrons. New features to connect with social networks for information dissemination and sharing purposes were also added.

Findings: The initial workflow was disjointed and involved many parties in publishing subscribed database's information on the database Web pages. This delayed the process of getting the information to the end-user. After reviewing the system and working with the IT support to enhance the workflow, the publishing of a subscribed database on the webpage could be done much faster. The Subject librarians no longer need to know HTML coding as a WYSIWYG user interface using CSS technology was provided and control was put at their fingertips to publish or update the database information pages under their purview in real time.

Keywords: Library databases, User interfaces, Singapore, Online directory, Web design, Web 2.0

Introduction

Nanyang Technological University Library (NTU Library) initiated the redesign of their Library Database Page in 2007 tapping on Web 2.0 technologies. The Library Technology and Systems Division which oversees the library IT infrastructure coordinated the project with technical support from the Centre for IT Services. The Library Database Page is a web-based application that offers an authoring environment tailored to enable users to access and use all the subscribed databases in an organised and seamless way. The revamped Library Database Page (2009) also organizes library database listings, bibliographic records, and external links through an administrator's module using Oracle DBMS. Patrons can access all the databases and locate appropriate resources for their assignments. This eases the daunting task of research and the administrative task of requesting for access information (ID and Password) to the databases subscribed by the library (OCLC, 2009).

In this project, the team aimed to develop an integrated framework for managing the Library Database Management System. The framework would provide a single workflow for the administration of the subscribed database webpage, information pages as well as to provide a modern and intuitive end-user interface for library patrons to access with ease and connect with social networks for sharing purposes.

Findings

The trend to provide database management and accessibility from a single point of entry has been a natural evolution: from the print-based medium to the electronic medium, in line with the evolution of librarianship (Mech, 1996). With the advent of technology, the *raison d'etre* has actually become a reality in the Internet age. Patrons now struggle to access, select and navigate through the vast online information available to them (Wales, 2005). Furthermore, in an academic library setting, the number of subscriptions to information and databases providers can exceed more than 100 subscriptions (Cholin, 2005). With these figures, the management of information would become a hassle if there is no systematic workflow to organise the accessibility and dissemination of information to the patrons.

Before the development to enhance the NTU Library Databases Interface, the workflow was disjointed. There were many parties involved (such as subject librarians, system librarians and acquisition librarians) to publish information about the subscribed databases on the webpage (Hundie, 2003). This delayed the process of getting the information to the patrons. After reviewing the system and working with the IT support to enhance the workflow, publishing of a subscribed database on the webpage could be done much faster now. In this project, we also looked at the web competency of Subject librarians. The decision to replace the need to know Hypertext Mark-up Language (HTML) coding with a What You See Is What You Get (WYSIWYG) user interface using Cascading Style Sheets (CSS) technology empowered the non-technical librarians to publish or update database and information pages under their purview easily and in real time.

The Database Management Process

Initially, the library database administrator used basic HTML web design to manage subscribed databases on the website. As the number of subscribed e-resources grew, an issue with the efficient management of this information emerged. The process to publish a link was time consuming as the librarian had to sift through HTML codes to effect changes, debug and test them. This action took time and tactful communication with the stakeholders of the databases.

Figure 1: HTML Coding in the first versions

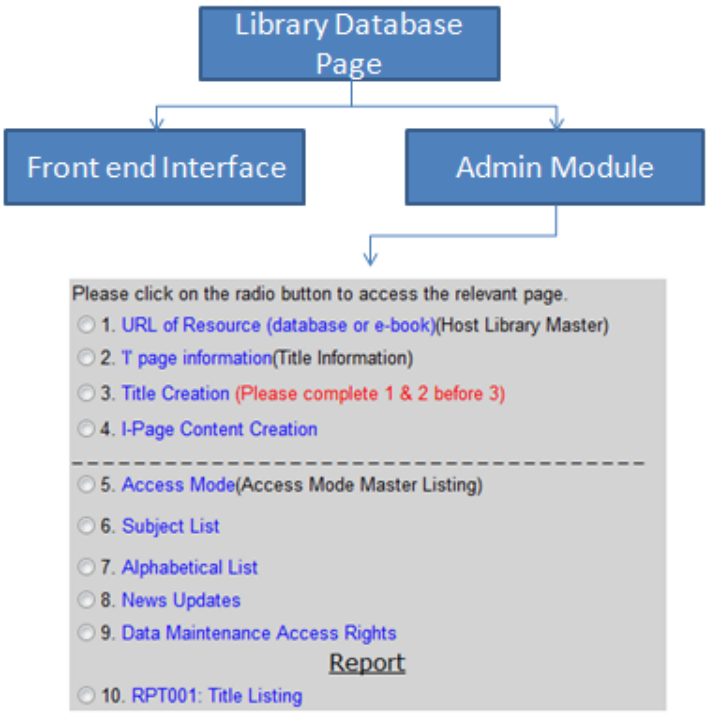
To establish a systematic and organised structure, the team began by looking at the back end structure of the system, listing down the key areas required to enhance the system.

The system actually has two interfaces, which are: (i) the front end interface and (ii) the administration module. Library patrons will only be able to view the front end interface, while subject and system librarians are able to view both interfaces (see Figure 3).

In the first stage, the system librarian in-charge of the system received a unique web address from the Serials Division once a database is subscribed by Library. This unique web address was encrypted via a web proxy server program, EZproxy. This would allow authenticated access from outside the campus network. NTU staff and students could log in and gain access to databases and other electronic resources from anywhere in the world as long as they have an Internet connection and a valid network account. In the second stage, each web address was linked to an information page, providing library patrons with more information about the database. In stages three and four, the system librarians would create the database entries and link them to the information page and publish to the database page. Figure 2 shows the new workflow.

Figure 2: Workflow is introduced

Figure 3: System Workflow



Deliverables

In this project, the team decided to achieve and implement the following deliverables:

- A systematic and organised administration module to manage and publish information for the subscribed databases
- A unique look and feel for ease of use and accessibility to the subscribed databases
- Empower the Librarians to publish and update information pages for databases under their purview independently and instantly using WYSWYG technology
- Enhance community resource sharing by linking Information pages to social networking sites

- Enhance information pages with multimedia capabilities
- Enable easy tracking of database usage and patterns

Achievements

a. Quick usage report analysis generation with Google Analytics, look and feel, ease of use and accessibility to the subscribed databases

In this project, the team had given a new facelift to the Library Databases page (see Figure 4). Factors that the team had taken into consideration when designing this facelift were:

(i) ease of use

(ii) accessibility

(iii) presentation of information

(iv) cascading style sheets

(v) icons

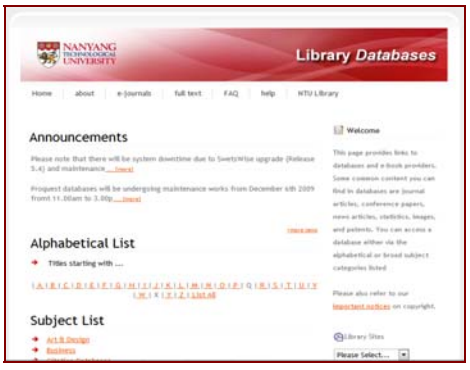
(iv) navigation and the pedagogical approach in using the database site

The team also followed closely the trends in today's web design concepts and Web 2.0 standards.

Figure 4: Before & after the facelift

Before

After

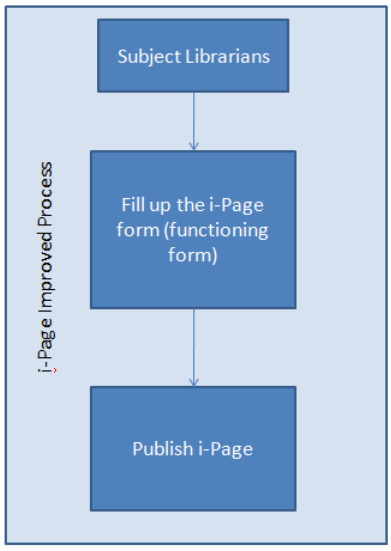


b. Empower the Librarians to publish and update information pages

One of the challenging jobs of a subject librarian would be to manage the vast database resources, and to satisfy the need for information on demand from patrons. Unfortunately most Web tools (such as Dreamweaver and FrontPage) are designed for more technical people. This problem of managing information on the web would continue to grow because of the increasing demand for quick and accurate online information. Another contributing factor would be a growing need to integrate new and existing information (or content) to sustain the patron's interest to revisit the website. This is especially true with today's complex websites where "content" would not be limited to text but also graphics, audio, or video, and include being able to share and push these content to other sites for dissemination to friends and peers.

The team decided to introduce a process called a "functioning form" (see Figure 5) whereby subject librarians can create and publish content quickly on the database website. In this process, the subject librarians can focus on the content itself, rather than the how to create a web page. This was done via a simple WYSIWYG form that can be published directly to the Web.

Figure 5: The Function Form Model



Furthermore, the "What You See Is What You Get" (WYSIWYG) concept reduced the learning curve for subject librarians involved in web publishing.

The new form of publishing also allowed the subject librarians to embed snippet of codes to enhance the website's presentation and interactivity using new media technology. For example: subject librarians could embed snippets of codes from YouTube, Slideshare and even PDF files into the form. This would enrich the information page of each database with multimedia content that would help our patrons use and understand the resource better.

Figure 6: The Information Page of each database page

In addition to the "functioning form", the presentation of the page was more systematic and organised. The web pages were optimised for indexing by popular search engines, which made the NTU Library digital resources more visible on the web.

c. Enhance community resource sharing by linking Information pages to social networking sites

The Internet is designed to be a simple and effective means for users to search, browse and retrieve information. It also facilitates the sharing of information with others. This gave rise to the idea of integrating the social bookmarking utility into the information page to take advantage of the opportunities provided for by the Internet to disseminate and share information quickly with others. Users can now quickly save and share the information pages effectively and efficiently with the simple use of the 'AddThis' sharing button that links to popular social networking spheres such as Facebook, Twitter, Delicious and others in a fun way.

Figure 7: AddThis Function Box

With the integration of the 'AddThis' widget, the team was able to tap on to the growing trend of community information sharing. From here, the report will illustrate how many times patrons have used the button menu in specific ways, for a selected time period. The types of interactions include All Types, Bookmarks, Emails, and RSS Subscriptions. These give the team the ability to select different time periods to understand usage trends.

d. Enable ease of tracking database usage and patterns

Today, libraries are operating differently compared to five years ago. The digital content online has grown. Web technologies have become an essential component of the library IT's architecture and delivering these services requires both technical and administrative ability. In this initiative, the team decided to install Google Analytics to track the online patrons' behaviours, and study the motivations behind their search for information. Furthermore, Google Analytics is able to provide information on where the patrons came from, what pages they visited, how long they stayed on each page, how deep into the site they navigated, where their visits ended, and where they went from there in a visually enhanced reporting format. From the analysing data, the team was able to follow up and suggest further changes to the online service and platform.

Fig 9.1 : 2008 Patrons (before enhancement)

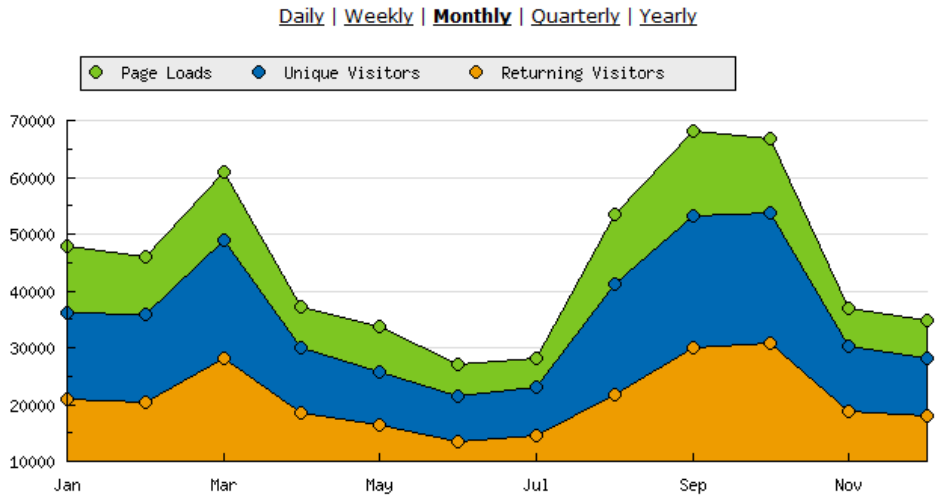
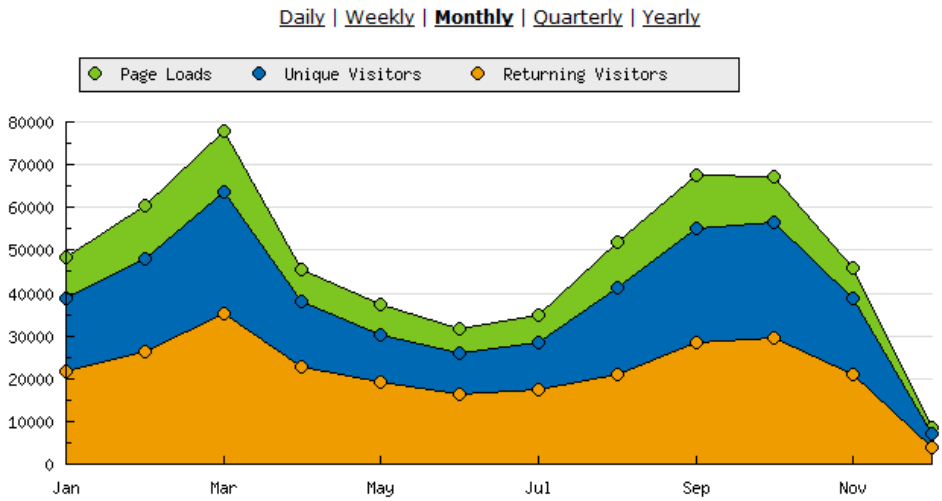


Fig 9.2 : 2009 Patrons (after enhancement)



In 2008, before the initiative to enhance the database website, this portion of the digital library had one of the highest numbers of online patrons, with an average of 38,000 visitors. After the enhancement, there was an average increase of 15 to 30 percent of visitors, with a total of 221,290 visits and a bounce rate of 17.64 percent. (See Figure 9.1 and 9.2). With the use of Google Analytics (see Figure 10), the team learnt that each patron spent an average of 2 minutes on the site, either browsing the information pages, or locating the resources and accessing to the databases directly.

Figure 10: Site Usage

Overall, Google Analytics offers an objective and multi-faceted statistical data in a visual way for the team to better understand the interaction between their visitors and their websites. With this data, the team can improve the website further in the next enhancement phase.

Research Limitations & Implications

The Library Database Page is of vital strategic importance to NTU library's online information services. It makes up part of the main core of the library IT's infrastructure, giving organised and easy access to the library's databases. The project has evolved into an ongoing one whereby the development would be carried out in phases. In the next phase, the team will explore enhancing the user experience with today's new web technologies, such as AJAX, RSS, search and many more. This project would help the librarians learn about best practices and the learning experiences of other libraries to develop the digital library of the future!

Conclusion

In this initiative to enhance the library database interface, the team has achieved an integrated workflow for the librarians involved in publishing information on the library database webpage. The team has also enabled the library subscribed e-resources to be easily searchable and visible on the web. Another enhancement made was the snippets of information that can be pushed into the social web sphere, such as Facebook and Twitter. This is actually a form of indirect marketing that can be very effective. Patrons can now share and even leave comments on the database resources they have used on their online social sphere. This means, knowledge becomes mobilised from the library's portal into the public domain.

In terms of the design aspect, the team had implemented CSS (Cascading Style Sheets) to control the look and feel to achieve a more organised and consistent look for the patrons. The team also ensured that the design has a new professional look in line with web 2.0 design concepts to connect with the Net generation that makes up the majority of users in the University.

In conclusion, the team has changed the traditional look and feel of a library database page by enhancing its user interface and making it interactive. We have also adopted new ways and new technologies to measure and analyse the usage patterns and the search behaviour of our users, so that we can make their

research experience a better one! There are plans to further enhance the database services in the next phase.

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