<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Enhanced library database interface (Main report and presentation slides)</th>
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<tr>
<td><strong>Author(s)</strong></td>
<td>Loh, Hazel.; Nurhazman Abdul Aziz.; Tan, Michael Siew Chye.</td>
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<td>NTU</td>
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Libraries for Tomorrow 2009

Enhanced Library Database Interface

Nurhazman Abdul Aziz, (nurhazman@ntu.edu.sg), Michael Tan Siew Chye (tansc@ntu.edu.sg), Hazel Loh, (ktvoo@ntu.edu.sg)
15/12/2009
Abstract

Purpose – This project initiative seeks to develop an integrated framework for managing the Library subscribed Databases. It aims to provide a single workflow for the administration of the subscribed databases and information web pages, as well as provide a modern and intuitive end-user interface for library patrons to access with ease and connect with social networks for information dissemination and sharing purposes.

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, 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 is provided and control is now at their fingertips for publishing/updating database information pages under their purview in real time.

Deliverables:

- Empower user (the Librarians) to publish and update information pages for databases under their purview independently and in real time.
- Enhance community resource sharing by linking Information pages to social networking sites.
- Enhance information pages with multimedia capabilities.
- Enable ease of tracking of Database usage and patterns.

Benefits:

- Provide end-user interactivity for the information pages.
- Significantly reduce the coordination and time to publish/update database information pages.
- Quick usage report analysis generation with Google Analytics.

Research limitations/implication – This is an ongoing project. Currently we have completed Phase 2, where we focussed on improving the look and feel of the website and management of information, in particular the ease of user access and site administration.

Practical implications – The paper uses web page design elements from today’s Web 2.0 trends, to strengthen the ease of accessibility and management of the various databases subscribed by the Library.

Originality – This paper offers a non-technical perspective to librarians and institutions in designing and managing their subscribed databases using a web directory user interface that facilitates ease of access for users and ease of managing the vast number of databases links and information for librarians.

Keywords – Library Databases, User Interfaces, South East Asia, 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).

Thus, in this project initiative, the team aims to develop an integrated framework for managing the Library Database Management System. This is to 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 a print based medium to an electronic medium, which aligns to 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 has become a hassle if there is no systematic and proper 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 initiative, we will also look at the web competency of Subject librarians. The decision to replace the need to know Hypertext Mark-up Language (HTML) coding to a What You See Is What You Get (WYSIWYG) user interface using Cascading Style Sheets (CSS) technology empowers the non-technical librarians to publish/update databases 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.

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.

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

Deliverables

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

- A systematic and organised administration module to manage/publish information for the subscribed databases
- A unique look and feel for ease of use and accessibility to the subscribed databases
• Empower users (the Librarians) to publish and update information pages for databases under their purview independently and instantly using WYSIWYG technology.
• Enhance community resource sharing by linking Information pages to social networking sites.
• Enhance information pages with multimedia capabilities.
• Enable ease of tracking 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 initiative, the team has given a new facelift to the Library Databases page. Factors that the team had taken into consideration when designing this facelift were: (i) the 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 with trends in today’s web design concepts and Web 2.0 standards.

![Before & after the facelift](image)

**Figure 4: Before & after the facelift**
b. Empower users (the Librarians) to publish and update information pages

One of the challenging jobs of a subject librarian is to manage the vast database resources, and to satisfy information on demand from patrons. The fact that libraries today have to rely on their librarians to maintain digital content adds to this challenge. Unfortunately most Web tools (such as Dreamweaver and FrontPage) are designed for more technical people. This problem of managing information on the web will continue to grow because of the increasing demand for quick and accurate online information. Another contributing factor is that there is a growing need to integrate new and existing information (or content) so as to sustain the patron’s interest to revisit the website. This is especially true with today’s complex websites where “content” may refer not only to text but also to graphics, audio, or video, including being able to share and push these content to other sites for recommendation to friends and peers.

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

Furthermore, “What You See Is What You Get” (WYSIWYG) concept reduces the learning curve for subject librarians involved in web publishing. The new form of publishing also allows the subject librarians to embed snippet of codes to enhance the website’s presentation and interactivity using today’s new media technology. For example: subject librarians can embed snippets of codes from YouTube’ video, Slideshare PowerPoint and even PDF files into the form. This will enrich the information page of each database with multimedia content that will help our patrons use and understand the resource better.

In addition, to the “functioning form”, the presentation of the page is more systematic and organised. The web pages are optimised for indexing by popular search engines. This makes 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 does well also to facilitate sharing of information with others. There arises 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 extends to popular social networking spheres such as Facebook, Twitter, Delicious and others in a fun way.

With the integration of ‘AddThis’ widget, the team is able to draw out the sharing trends. 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.

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. The team could learn 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.

![Site Usage](image)

**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/implication**

Library Database Page is of vital strategic value to NTU library’s online information services. This 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 is to 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 initiative may help the librarians exchange best practices and learning experiences 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 is 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 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 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 comprise the majority of users in the University.

In conclusion, the team has changed the traditional look and field 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 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.
References


Enhanced Library Database Interface

Administrative : Workflow : Design : Sharing : Analytics

Library Technology & Systems Division
Nanyang Technological University Libraries

Nurhazman Abdul Aziz, Assistant Librarian
Tan Siew Chye Michael, Senior Librarian
Hazel Loh, Deputy Director

Monday, November 02, 2009
INTRODUCTION
A raise of hands first ...
if you are a **reference** librarian
if you are a **technology** librarian
does your library subscribe to more than 100 databases
and, do you lose sleep managing all these databases
for your library patrons,
to experience an ...
organised, seamless, enriching & interactive access to online resources
and

align strategically
to your library’s service model
is it an easy task to deliver this
let’s take a look ...
let us **share with** you,

who we are & where we are from ...
so we tell you ... we are from ...

NTU Libraries
and, this is our **story**
NTU Librarians started to ...
... study

“How libraries manage their library databases” ...
... especially, the academic libraries
we also studied examples from the online information providers, like ...
How they designed their directory system
so,

our main objective
is to develop an integrated framework for managing the Library Database Management System
the design methodologies ...
we are using the

Knowledge Approach
how many of you have used NTU Libraries e-resources, as an online patron
do you remember this website
Alphabetical List: A - I

[A]  

- ABI/INFORM via ProQuest  
- Academic Search Premier via EBSCOhost  
- Accounting & Auditing Library  
- Accounting and Tax via ProQuest  
- ACM Digital Library  
- ACM Guide to Computing Literature via ACM Digital Library  
- AES Electronic Library  
- AIAA Meeting Papers on Disc 1997-98  
- American Institute of Aeronautics and Astronautics (AIAA)  
- Alloy Finder Version 2.0  
- Anatomy.TV  
- Arts and Humanities Citation Index  
- ASCE Civil Engineering Database (CEDB) [citations only]  
- ASHRAE Handbook  
- ASHRAE Transactions  
- Asia Insurance Review - Electronic Archive 1999  
- ASM Handbook  
- ASTM Standards (Full-text) via Specs and Standards
NTU Library Database Page

Located at http://www3.ntu.edu.sg/lib/collections/db_old/alpha1.htm
The Directory
The Information Page

ABI/INFORM via ProQuest

One of the world’s first electronic databases and a premier source of business information with content from thousands of journals and publications. Users can save desired articles as hypertext links to review later or share with others, find out how to do it [here](#).

**Related Database:** Business Periodicals OnDisc (BPO) - A series of archival CD-ROMs with citations from ABI/INFORM Global, containing abstracts and indexing with selected article images. Subscription ceased.

**Access**

- For NTU Staff & Students.
- Restricted on site access for:
  - NIE Staff & Students (logon to NTU Libraries PCs)
  - Associate Members (approach our Research Assistance Desk, Lee Wee Nam Library, Level 2)

**ABI/INFORM via ProQuest**

- *Standalone* Standalone PC #4, #6 (in Lee Wee Nam Library, Level 2) for BPO

**Source**

ProQuest Company

**Databases**

ABI/INFORM via ProQuest includes:

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- **ProQuest Newspapers (Including Wall Street Journal)** - Collection of newspapers.

**Data**

Bibliographic with abstracts, Full-Text, Text+graphics, Full image (for ABI/INFORM via ProQuest)

Abstracts, Indexes, Page image (for BPO)

**Coverage**

1971 - present (for ABI/INFORM Global)

**Topics Covered**

Business conditions, trends, management techniques, corporate strategies and industry-specific topics worldwide
how do NTU Librarians MANAGE these databases
| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |<br>"Need help?"
isn’t it **too tough**
for a librarian to handle
to play with codes (HTML, Javascripts)
and, we were facing a number of other challenges, as a librarian.
what do we NEED
listing out ...
... the strengths
... the weakness
... the opportunities
... the threats
how are we going to solve this challenge
challenge ONE
interactive intuitive design
friendly interface
web 2.0 look and feel
enriching visibility
challenge TWO
Alphabetical List:

A - I

Need help?
into a simple solution
for the **librarians**, by the **librarians** to the **patrons**
we
decided to look
into these areas
Administrative : Workflow : Design
Sharing : Analytics
1. Administrative
rather than look into unstructured codes
Please click on the radio button to access the relevant page.

1. URL of Resource (database or e-book) (Host Library Master)
2. 'I' page information (Title Information)
3. Title Creation (Please complete 1 & 2 before 3)
4. I-Page Content Creation
5. Access Mode (Access Mode Master Listing)
6. Subject List
7. Alphabetical List
8. News Updates
10. RPT001: Title Listing
2. Workflow
no proper workflow
Library Database Page

Front end Interface

Admin Module

Please click on the radio button to access the relevant page.
1. URL of Resource (database or e-book) (Host Library Master)
2. Title page information (Title Information)
3. Title Creation (Please complete 1 & 2 before 3)
4. I-Page Content Creation

5. Access Mode (Access Mode Master Listing)
6. Subject List
7. Alphabetical List
8. News Updates
9. Data Maintenance Access Rights

Report

10. RPT001: Title Listing
Subject Librarians

Fill up the i-Page form (functioning form)

Publish i-Page

i-Page Improved Process
how do we deliver this
functioning forms approaches:

**WYSWYG**

(What You See Is What You Get)
<table>
<thead>
<tr>
<th>Name of Database*</th>
<th>Gartner Core Research / Gartner Industry Advisory Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source*</td>
<td>Gartner Group.</td>
</tr>
<tr>
<td>Access*</td>
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</tr>
</tbody>
</table>

**Gartner Core Research**

- For NTU Staff & Students.
- Restricted on-site access for:
  - NIE Staff & Students (logon to NTU Libraries PCs)
  - Associate Members (approach our Research Assistance Desk, Lee Wee Nam Library, Level 2)

**Gartner.com**

**Gartner Industry Advisory Services**

- For NTU Staff (Academic, IT Professionals & Research Staffs) only
- Please email subject librarian for more information to access.
- Topic covered: (1) Gartner for IT Leaders, (ii) Banking & Financial
Instead of...
We have...
<table>
<thead>
<tr>
<th>Library</th>
<th>Close</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note:</strong> * denotes mandatory field</td>
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---

*Note: The content in the image is a screenshot of a database entry from the Nanyang Technological University Libraries.*
with the idea of having the functioning form
a workflow established
Subject Librarian’s view
Gartner Core Research / Gartner Industry Advisory Services

Name of Database: Gartner Core Research / Gartner Industry Advisory Services
Source: Gartner Group.

Access:
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- Topic covered: (I) Gartner for IT Leaders, (II) Banking & Financial Services (III) Insurance & (IV) Media

Database Description:
Gartner Core Research covers the full range of products and technologies associated with core components in the research industry, such as (I) by Market, (II) by Topic and (III) by Industry. Library users can expect total coverage that focuses on every conceivable aspect of IT and telecom intelligence. On top of these, Library users can also expect real-world advice and answers on their desktop. For more information, please click to this url.

Analyst Take: Customer Relationship...
3. Design
THE OLD LOOK THEN....
THE NEW LOOK NOW.....

Announcements

Wiley Interscience will not be available on 19 Oct 2009 from 4pm to 5pm for system maintenance.

CEIC WebCDM database is not available till further notice due to technical problems. Sorry for the inconvenience.

Alphabetical List

- Titles starting with ...

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z List All

Subject List

- Art & Design

Welcome

This page provides links to databases and e-book providers. Some common content you can find in databases are journal articles, conference papers, news articles, statistics, Images, and patents. You can access a database either via the alphabetical or broad subject categories listed.

Please also refer to our important notices on copyright.
About the Database Collection

The library subscribes to more than 120 online databases & e-book packages to support the research, teaching and learning activities of the University. The collection covers the major disciplines, namely, engineering, science, business, communication & information studies, arts, humanities & social sciences.

Welcome

This page provides links to databases and e-book providers. Some common content you can find in databases are journal articles, conference papers, news articles, statistics, images, and patents. You can access a database either via the alphabetical or broad subject categories listed.

Please also refer to our important notices on copyright.

Library Sites
4. Sharing
Dull, no **systematic** way in the presentation

One of the world's first electronic databases and a premier source of business information with content from thousands of journals and publications. Users can save desired articles as hypertext links to review later or share with others, find out how to do it [here](#).

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**Source**

- ProQuest Company

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**Standalone**

| Standalone PC #4, #6 (in Lee Wee Nam Library, Level 2) for BPO |

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**Coverage**

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- Business conditions, trends, management techniques, corporate strategies and industry-specific topics worldwide
ABI/INFORM via ProQuest

Name of Database: ABI/INFORM via ProQuest
Source: ProQuest Company

For NTU Staff & Students.
Restricted on-site access for:
-- NIE Staff & Students (logon to NTU Libraries PCs)
-- Associate Members (approach our Research Assistance Desk, Business Library)

Brief Notes: ABI Inform is a source of business and management information with content from thousands of journals and publications.
which provides interactive information, about each database offered
Gartner Core Research / Gartner Industry Advisory Services

Name of Database
Gartner Core Research / Gartner Industry Advisory Services

Source
Gartner Group.

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Gartner Core Research

Access
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with the **social** sphere
Library Databases

Gartner Core Research / Gartner Industry Advisory Services

Name of Database: Gartner Core Research / Gartner Industry Advisory Services
Source: Gartner Group.

Bookmark & Share:
- Email
- Print
- Digg
- MySpace
- Facebook
- Twitter
- AddThis

What's this? gartner.com

Bookmark & Share:
- Email
- Print
- Digg
- MySpace
- Facebook
- Twitter
- AddThis

What's this? gartner.com
we are
able to share
our database information page
5. Analytics
do we measure it
measuring the outreach (share)
thus, we do measure and monitor our internal & external activities around the system
what do you think when we made these as a package to our librarians in providing a robust system interface
The Cycle

Knowledge Immersive

Knowledge Awareness

Knowledge Management

Knowledge Creation & Development

Knowledge Presentation & Sharing
we try to be as innovative as possible
to explore new ways in managing
and **presenting** our database resources
Thank you.

https://venus.wis.ntu.edu.sg/lib_databases/
Enhanced Library Database Interface

Administrative : Workflow : Design : Sharing : Analytics

Library Technology & Systems Division
Nanyang Technological University Libraries

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