Innovative Use of SFX and Legacy Data to Develop a Library Quick Search Tool & Its Mobile Extension

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UMDNJ Overview

- Largest standalone health sciences university in U.S.
- Eight schools: GSBS, NJDS, NJMS, SHRP, RWJMS, SN, SPH, SOM, on 5 campuses
- Student enrollment: 6,063
- Full and part-time faculty: 2,949
  - a) clinicians
  - b) researchers
- Residents & interns: 1,315
UMDNJ University Libraries

- Four campuses libraries:
  - G.F. Smith Library in Newark
  - Robert Wood Johnson Library on the New Brunswick/Piscataway campus
  - Camden Campus Library
  - Health Sciences Library at Stratford

- SFX implemented in 2005
- Shared electronic resources (as of May 2011)
  - E-Journals: 12,650 unique titles; 26,000 active records
  - E-Books: 710 titles
  - Databases: 86 databases
  - Images collections & Videos: 20 including publicly available

- Separate ILL services
- Independent print collections (63,000 books)
Rationale for Developing Library Quick Search Tools

- Redesign of website planned.
- Conducted focus groups with students on the following:
  - Comments & suggestions on old website
  - Ideas for better features on new website
    - Sample features presented for review
  - Single & one-stop search box was favored
    - Capability to search PubMed from homepage
    - E-resources titles only (catalog is not a good choice)
    - Directly linked to the e-resource’s site (not favor of choices on SFX menu)
    - Quick search speed is preferred (tried federated search tools but it did not work out)
- Some Issues
  - Static web pages for many e-resources
  - Limits of OPAC
  - Experiences with a commercial federated search tool
  - SFX A-Z List and Menu
Design Goals & Objectives

- Create a one-stop search for all e-resource titles including subject guides, e-databases, e-books, and e-journals.
- Make the Search Box in the center of the Library’s front page.
- Provide two most popular databases for direct search: PubMed & CINAHL.
- Prioritize the core medical content while making all titles available.
- Ensure quick search speed.
- Keep interface and display format simple and easy.
Other Considerations

- Low or minimal cost – by utilizing existing hardware and mainly open sources software
- Taking advantage of external sources’ searching capability.
- Making full use of existing commercial and legacy systems
- Being flexible enough to provide future expansion. More features added at later stages, e.g.
  - Auto-complete function for core titles
  - Mobile extension
What Quick Search Is NOT

- It is not an enterprise level application - does not have a complicated multi-layers architecture.
- It is not replacing but supplemental to OPAC.
- It is not a true federated search but it has similar functions.
- It is not a discovery interface - no unified index, no relevance ranking, and no faceted browsing, etc.
What Quick Search IS

- It is a simple query interface that searches all e-resources.
- It is a lightweight and hybrid search toolkit consisting of a set of scripts.
- It was built upon various open source tools/technology: Perl/PHP/JavaScript/XML/AJAX/jQuery/iQuery Mobile/MS ACCESS/MySQL, etc.
- It is a real low-cost approach – combining the existing library legacy data and the data exposed by SFX.
What Quick Search IS – Cont’d

- It was locally developed by our System Librarian.
- Minimal cost of software and hardware.
- For SFX V3 – data was downloaded to a local server; for SFX V4 – it uses the real-time e-journal data from SFX.
- The legacy data was exported and converted into a relational database.
Quick Search Features

- Embedded in the center of the newly designed website. [http://libraries.umdnj.edu/rwjlbweb](http://libraries.umdnj.edu/rwjlbweb)
- Direct search in the most popular databases: PubMed & CINAHL
- One search for all e-resource titles including subject guides, e-databases, e-books, and e-journals.
- An A-Z e-title browsing list.
- Limited subject search included.
- Core title list enabled with auto-complete feature.
Quick Search Features – Cont’d

- Alternative path for searching print materials in OPAC.
- Embedded search for PubMed sub-category as well as all UMDNJ licensed clinical databases.
- A true article search functionality based on NCBI’s E-utility.
- Extended into our new mobile web site using jQuery Mobile.
A Glance at RWJ Library’s NEW Website

Quick Search

Find articles:  from PubMed CINAHL

Complete List of Databases

Find E-Resources by title:

Search the Catalog:

Quick Links

- ANGEL/my.UMDNJ
- EJournals List
- EndNote Blog
- iTunes U (RWJMS)
- Library Catalog
- MDConsult
- Ovid Medline (1990-Present)
- Mobile Devices Resources
- Remote Access
- Subject Toolkits
- UMDNJ E-Mail

Re-register your Essential Evidence Plus hand held now.

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Phone: 732-235-7610; Fax: 732-235-7828; Email: moblib@umdnj.edu
A Closer Look at the Quick Search Tools

The first quick search box is an embedded search script which provides a direct search against selected databases such as PubMed and CINAHL.
Redirect.cgi is a simple perl script which provides a direct search against PubMed, CINAHL and other medical/clinical sources

```perl
if ($strDB eq "pubmed")
{
    ........
    my $URL =
    print "<script type='text/javascript'>";
    print "window.location='$URL'";
    print "</script>";
}

elsif ($strDB eq "cinahl")
{
    ........
    my $URL =
    print "<script type='text/javascript'>";
    print "window.location='$URL'";
    print "</script>";
}
```


The second search box is a database-driven search program, capable of searching the UMDNJ e-resource collection including e-journals, e-books, databases, and subject toolkits. A limited subject search is available for e-books and databases. Titles can also be browsed by alphabet.
Auto-complete function is applied when searching for an e-resource’s title
E-Journals Display Format

Clinical Tools:
ACP Journal Club
Access Medicine
Cochrane Library
D.A.R.E
DynaMed
Essential Evidence Plus
First Consult
Medical Letter

Other databases:
CINAHL
Medline
MD Consult

Health United States 2004 - E-book from NCBI Bookshelf
Priorities in Health - E-book from NCBI Bookshelf
Public Health & Preventive Medicine - E-book from Stat!Ref

ELECTRONIC JOURNALS:

American journal of public health - ISSN - 1540-0048 - full text available from 1975 -
American journal of public health (1912) - ISSN - 0271-4353 - full text available from 1912 - 1927
American journal of public health and the nation's health - ISSN - 0002-9572 - full text available from 1928 - 1970
Annals of tropical medicine and public health - ISSN - 0974-6005 - full text available from 2008 -
Annual review of public health - ISSN - 1545-2093 - full text available from 1997 -
Australian and New Zealand journal of public health - ISSN - 1753-6405 - full text available from 1997 -
BMC public health - ISSN - 1471-2458 - full text available from 2001 -
Bulletin of the Public Health - ISSN - 1471-2458 - full text available from 1878 - 1878
Canadian Journal of Public Health - ISSN - 0008-4263 - full text available from 1998 -
Critical public health - ISSN - 1469-3682 - full text available from 1998 - 2010
Disaster Medicine & Public Health Preparedness - ISSN - 1938-744X - full text available from 2007 -
European Journal of Public Health - ISSN - 1007-1100 - full text available from 2008 - 2010
Evidence-based healthcare & public health - ISSN - 1744-2257 - full text available from 2004 - 2005
Health services reports - ISSN - 0090-2918 - full text available from 1972 - 1974
Indian Journal of Public Health - ISSN - 2229-7693 - full text available from 2010 -
International Journal of Collaborative Research on Internal Medicine & Public Health - ISSN - 1840-4529 - full text available from 2009 -
International Journal of Environmental Research and Public Health - ISSN - 1660-4601 - full text available from 2008 -
Journal of Environmental and Public Health - ISSN - 1687-9813 - full text available from 2009 -
Journal of public health - ISSN - 1613-2238 - full text available from 1997 -
Journal of public health - ISSN - 1741-3850 - full text available from 2008 - 2010
Journal of public health dentistry - ISSN - 1752-7325 - full text available from 1997 -
Journal of public health management and practice - ISSN - 1550-5022 - full text available from 2002 -
Journal of Public Health Policy - ISSN - 1745-655X - full text available from 2006 - 2010
Legacy Data Source

- **Jinput data file:**
  - over 5800 medical related core titles
  - a flat BerkleyDB file converted to a Oracle table
  - original purpose: short URL/statistics
  - continue using and well maintained

- Jinput data file was downloaded and converted into a MS Access table

- Subject link tables were created: toolkit, ebook_subject_link, and e-database_subject_link.

- Static web pages such as subject guides

- Those tables were joined with Jinput table to form a relational database.
Legacy Data Access

Following php script using ADODB to provide search for e-books, e-databases & toolkits by title, name and subject.

Example SQL query to find e-books by title and subject in ADODB:
```
$query = "SELECT DISTINCT title, url, database, cgi
FROM jinput
WHERE type = 'ebook' AND title LIKE '%%$keywords%%'
UNION SELECT DISTINCT title, url, database, cgi
FROM jinput
WHERE cgi IN (SELECT cgi FROM ebook_subject_link WHERE subject_id = (SELECT subject_id FROM ebook_subject WHERE subject = '%%$keywords%%'))";
```

PHP code to display the search results:
```
while(!$objrs->EOF) {

............

$realUrl = "<li><a href="http://www.umdnj.edu/cgi-bin/libjournal/" . $cgi->value . " target='_blank'""
```
SFX Data Access

- Jinput has only 5800 titles.
- SFX has over 12,600 titles.
- Jinput has no other metadata such as ISSN and holdings.
- SFX provides ISSN, holdings and SFX menu.
- Initial approach: the whole local instance was downloaded to the Quick Search server over night.
- After upgrading to V4, this approach is no longer feasible.
- A real time access to SFX data was built.
Threshold:

```php
$obj->parsedDate('>=','2008','84','undef') && $obj->timediff('>=','1y')
```

Example sql query to find e-journals locally in MySQL:

```sql
$query = "SELECT A.TITLE_NORMALIZED, F.THRESHOLD_GLOBAL, S.ISSN_ID, F.THRESHOLD, A.OBJECT_ID, MIN(SUBSTRING(F.THRESHOLD_GLOBAL, 23, 5)) AS HOLDING FROM AZ_TITLE A, AZ_FILTER F, AZ_LETTER_GROUP L, ISSN S WHERE A.OBJECT_ID = F.OBJECT_ID AND A.OBJECT_ID = S.OBJECT_ID AND L.AZ_LETTER_GROUP_ID = A.AZ_LETTER_GROUP_ID AND A.TITLE_NORMALIZED LIKE '%$keywords%'
GROUP BY A.OBJECT_ID ORDER BY A.AZ_TITLE_ORDER";
```
Example sql query to direct find e-journals in SFX 4:

```sql
$query = "SELECT A.TITLE_DISPLAY, R.FROM_YEAR, R.TO_YEAR, A.OBJECT_ID
        FROM AZ_TITLE A, AZ_FILTER F, AZ_LETTER_GROUP L, AZ_TITLE_SEARCH T,
        RAPID_SERVICE_INDICATOR R
        WHERE A.OBJECT_ID = F.OBJECT_ID
        AND A.OBJECT_ID = R.OBJECT_ID
        AND L.AZ_TITLE_ID = A.AZ_TITLE_ID
        AND A.AZ_TITLE_ID = T.AZ_TITLE_ID
        AND F.IS_RELATED = 'NO'
        AND T.TITLE_SEARCH LIKE '%$keywords%'
        GROUP BY A.AZ_TITLE_ID
        ORDER BY A.TITLE_SORT
";
```
SFX Data Display

PHP code to build an OpenURL and display the search result:

```
$ending = "&svc.holdings=yes&svc.fulltext=yes";

$sfxlink = $beginning . $object . $ending;
$sfxdisplay = "<li><a href='$sfxlink' target='_blank'>$title</a> - ISSN - $issn - full text available from $holding -$holding_end</li>";
```

echo $sfxdisplay;

Search results go beyond the titles. Some content info is also retrieved from PubMed and other databases.
Beyond Title – Embedded Database Search

Search "DEEP VEIN THROMBOSIS AND COMPRESSION STOCKINGS" in the following sources:

PubMed:
- Pubmed Searches
- Systematic Reviews
- Randomized Controlled Trials
- Clinical Trials
- Recent Reviews
- Therapy
- Diagnosis
- Prognosis
- Harm
- Etiology
- Epidemiology

Clinical Tools:
- ACP Journal Club
- Access Medicine
- Cochrane Library
- D.A.R.E
- DynaMed
- Essential Evidence Plus
- First Consult
- Medical Letter

Other databases:
- CINAHL
- Medline
- MD Consult

UMDNJ – RWJ Library of the Health Sciences – http://libraries.umdnj.edu/rwjlbweb
Beyond Titles – Full Text Article Search

Found "PUBLIC HEALTH" in the following articles:

- Service Dogs and People with Physical Disabilities Partnerships: A Systematic Review.
  - Winkle M, Crowe TK, Hendrix I.
  - Occupational therapy international
  - 2011 Aug 19;

- Comparing the risk factors associated with serious versus and less serious work-related injuries in Ontario between 1991 and 2006.
  - Smith P, Hogg-Johnson S, Mustard C, Chen C, Tompa E.
  - American journal of industrial medicine
  - 2011 Aug 19;

- Sacral neural crest-derived cells enter the aganglionic colon of Ednrb(-/-) mice along extrinsic nerve fibers.
  - Erickson CS, Zaitoun I, Haberman KM, Gosain A, Druckenbrod NR, Epstein ML.
  - The Journal of comparative neurology
  - 2011 Aug 19;

UMDNJ – RWJ Library of the Health Sciences – http://libraries.umdnj.edu/rwjlbweb
Quick Search New Interface

Search E-resources: public health

Search "PUBLIC HEALTH" in the following sources:

PUBLIC HEALTH SUBJECT TOOLKITS:

Public Health

ELECTRONIC DATABASES:

CDC Wonder
ClinicalTrials.gov
Cochrane Library - via Wiley
Health and Wellness Resource Center - via VALE
MEDLINE 1996 - Current - via Ovid
POPLINE
PubMed - via NCBI

ELECTRONIC BOOKS:

Found "PUBLIC HEALTH" in the following articles:

Karidis NP, Dimitroulis D, Kourakis G,
Global Financial Crisis and Surgical Practice: The Greek Paradigm.
World journal of surgery
2011 Aug 31;

Wang YC, Feng CC, Sithithaworn P, Feng Y, Petney TN,
How Do Snails Meet Fish? Landscape Perspective Needed to Study Parasite Prevalence.
EcoHealth
2011 Aug 31;

Mendy A, Gasana J, Forno E, Vieira ER, Dowdye C,
Work-related respiratory symptoms and lung
Mobile Quick Search

- Exploring various JS based mobile frameworks such as JQTouch and Sencha Touch
- Choose jQuery Mobile
  - A unified UI system across all popular mobile device platforms.
  - Theme based dynamic touch interface
  - Broadly compatible with HTML5/CSS3
  - It is small size and load quickly. Only 12KB for the JavaScript library, 6KB for the CSS, plus some icons.
  - Simple and easy to learn.
E-Resources Quick Search Tools Optimized for Mobile Devices

The same quick search tool can be used to search the electronic resources titles on a mobile device.
E-Resources
Quick Search:
E-Books
E-Resources Quick Search: E- Journals

1. Enter your title keywords: Pediatrics
2. Select E-resource type: E-journals Titles
3. Search results:
   - Academic Pediatrics
     ISSN: 1876-2867, Full text available from 2009 to
   - Advances in Pediatrics
     ISSN: 1878-1926, Full text available from 2005 to
   - Ambulatory Pediatrics
     ISSN: 1539-4409, Full text available from 2001 to 2018
   - Archives of Pediatrics & Adolescent Medicine
     ISSN: 1538-3628, Full text available from 1998 to
   - BMC Pediatrics
     ISSN: 1471-2431, Full text available from 2001 to
   - Clinical Pediatrics
     ISSN: 1938-2707, Full text available from 1999 to 2015
   - Contemporary Pediatrics
     ISSN: 2150-6345, Full text available from 1999 to 2015

UMDNJ – RWJ Library of the Health Sciences – http://libraries.umdnj.edu/rwjlbweb
Benefits & Impact

- Provides a more convenient and efficient web access for our users to find key biomedical content.
- Offers one-stop searching of UMDNJ e-resources either on a desktop computer or a mobile device.
- Provides direct search for PubMed & CINAHL.
- The A-Z listing acts as an alternative access points for e-database, e-books, & e-journals.
- Adopted in various ways by other campus libraries.
- Possible to be shared with and customized by other health care libraries.
Benefits & Impact – Cont’d

- Demonstrated that we care about our users’ concerns and responded to their needs effectively with innovative applications and services.
- Equally important we were able to accomplish the goal without any additional funding. This is particularly significant in today’s economic downturn.
- Maximizes utilization of UMDNJ’s e-resources.
Stats for Quick Search - Titles Only

Dashboard


Site Usage

- 3,454 Visits
- 6,708 Pageviews
- 1.94 Pages/Visit
- 63.14% Bounce Rate
- 00:03:55 Avg. Time on Site
- 46.76% % New Visits
Stats for Quick Search – PubMed & CINAHL

Top Content

Pageviews

- Jul 25: 300
- Jul 26: 150
- Aug 1: 300
- Aug 8: 150
- Aug 15: 150

2,196 pages were viewed a total of 3,390 times
Filtered for pages containing "redirect.cgi"

Content Performance

- Pageviews: 3,390 (10.07% of Site Total)
- Unique Pageviews: 2,453 (10.10% of Site Total)
- Avg. Time on Page: 00:03:01
- Avg. Time on Page: 00:02:24 (25.34%)
- Bounce Rate: 67.46% (Site Avg: 47.86% (40.94%))
- % Exit: 52.77% (Site Avg: 38.07% (38.62%))
- $ Index: $0.00 (Site Ave: $0.00 (0.00%))
Challenges & Future Plans

- Not as sophisticated as discovery/federated search tools.
- Not single search box interface yet - planning to combine the PubMed search and E-title search into one search box.
- Integrate other types of materials such as images & videos.
- Enhance subject search.
- Add more alternative options, e.g. ILL form & recommended resources based on usage data.
- Add more functionality, e.g. spell checker for PubMed search; export option such as Endnote?
- Dynamically create specialty subject toolkits with newly developed techniques.
- Expand legacy database to ultimately replace current static e-books and databases list.
Thank You!

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Mobile Demo