VuFind: An Emerging Open Source Discovery Tool

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Abstract

Since the early days of catalogues, the structure and interface of library tools used for accessing the resources are changing rapidly and dramatically to fulfil the changing user needs. In recent years, the behaviour of library users has been undergoing drastic changes due to increasingly use of web search engines and ICT based services. This paper describes the expectations of such users who are looking for information. It presents an optimized approach that enables academic libraries to provide its patrons with an up-to-date user experience while capitalizing on the unique advantages offered by libraries. Ways of integrating the new solution with the current library environment including features and functionalities of next generation catalogues are discussed.

Keywords: Vufind, Next Generation Catalogue, Discovery Tools, Web 2.0, Open Source Software

1. Introduction

In current information world, the way of information generation, distribution and access has been changed, with that the users' expectations also changed significantly. It can to be expected that users either come to the library physically or choose to the library OPAC as an ideal source of information. There have been several debates expressing widespread dissatisfaction with traditional OPACs and libraries are in phase of re-evaluating library discovery tools to provide better services. As such the traditional OPACs are no longer acceptable to meet the new challenges in a highly networked and integrated environment of current information era. It is now quite demanding that libraries need better tools to keep library services relevant for a new generation of user.

With the passage of time, Web OPACs came in to existence. Users can search the required information by connecting to Web OPAC through Uniform Resource Locator anytime from anywhere. Different definitions have been noticed on the Web according to which a"Web OPAC is an independent program designed separately from the Library Program. It is programmed to facilitate the library's members to access the OPAC, through their own search, for the ease of borrowing, instead of searching through the card catalogue."In addition, it facilitates members to make request for borrowing and even can make reservation to their needed material with reference to the library profiles. The development of Web OPAC is an extended form of OPAC with extraordinary benefits to the users.

A variety of open source technology are available that seeks to enhance knowledge discovery capabilities across multiple libraries and applications providing developers with tools to support a new class of software for the study of information. The knowledge discovery tool , a new generation of library catalogue system, is

distinguished from traditional OPACs by their use of more sophisticated search technologies, including relevancy ranking and faceted search, as well as features aimed at greater user interaction and participation with the system, including tagging and reviews. These newer systems are almost independent from the library's integrated library system, however they facilitates the synchronization of data between the existing systems. Thus, the next-generation catalogue is not a replacement of the existing integrated library management system, but it is one of the value addition and one step forward services to the users. Vufind is playing vital role among them.

2. Significance of Knowledge Discovery Tools and Desired Features

A Knowledge Discovery Tool is often referred to as a stand-alone OPAC, a discovery layer interface, an OPAC substitution, or the next generation catalogue, it is library search engine that allows users to search and browse beyond the resources of a traditional OPAC. They are next-generation catalogues that crawling data from OPACs and other resources, such as digital repositories, searchable index, etc.

The desired features of Knowledge Discovery Tools and Library Catalogues are,

❖ **Single Entry and Search Point for All Information:** The library catalogue should be a single search or federated search for all library materials, including pointers to the articles in electronic databases as well as records of books and digital collections. One search should retrieve all relevant materials. Presently, members have to search different catalogues for books, videos,

databases for journal articles, digital collections and archives.

❖ **State-of-the-art Web Interface:** Library catalogues should have a professional look similar to commercial sites.

❖ **Faceted Navigation:** By using this feature users can perform a very simple, initial search by their preferred keyword method and then refine their results by clicking on the various results facets. The result should display as set of categories based on some criterion such as dates, languages, availability, formats, locations, etc.

❖ **Enriched Contents:** Library catalogues should have facility to display contents in specialized and widely accepted format like, book cover images, user driven input such as comments, descriptions, ratings, and tag clouds or search clouds.

❖ **Keyword Search Box on Every Page:** Library catalogues should have search facility to each and every page from there user can easily navigate and perform their search.

❖ **Statistics and Analysis:** Library catalogues should have search facility to generate statistics of most issued books and other kind of analysis of the books.

❖ **Spell Checking:** By using this user can check spelling of searched keyword and can get suggestion of similar spelling.

❖ **Recommendations/Related Materials:** There should be display of recommended and similar titles of searched criteria.

❖ **User Contribution:** There should be facility to input descriptions, summaries, reviews,

criticism, comments, rating and ranking, and tagging at the user-end.

❖ **RSS Feeds:** Next-generation interface includes RSS feeds so that users can have new book lists, top-circulating book lists, canned searches, and "watch this topic" connections to the catalogue on their own blog or website.

❖ **Integration with Social Network and Micro-Blogging Sites:** When a library's catalogue is integrated with social network sites, users can share links to library items with their friends on social networks like Facebook and can also update the status on micro-blogging sites like Twitter.

3. About VuFind

VuFind is an open source library search engine that allows users to search and browse beyond the resources of a traditional OPAC. (http://en.wikipedia.org/wiki/VuFind) It is design and developed by Villanova University. Users can study, download, install, improve and redistribute the software.

VuFind is a next-generation catalogue that crawls data from OPACs and other reliable sources like digital repositories, open journal system and E-resources. This decoupled architecture offers the capability to create a better user experience for a particular collection but also unifies the way of the discovery method across heterogeneous collections. Discovery layers like VuFind seek to provide an improved experience for library users by providing a more modern interface, new features, and the potential to retrieve results from other major library systems such as article databases.

Vufind is developed in PHP programming language and uses Solr search engine to index MARC

records. It was developed by Andrew Nagy in 2007 at Villanova University to work with their Voyager system. And has gain popularity into world wide software project that can be used as front-end of many different integrated library software. As of December 2011, more than one hundred libraries using Vufind, which includes the National Library of Australia, Stanford, Yale and Georgia Tech (Falvey Memorial Library, Villanova University).
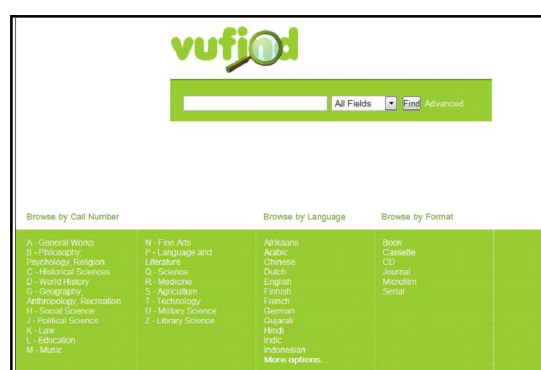

Figure 1:　Home Page of Vufind

VuFind offers one single search box, such as Google and other search engine does. Its relevancy rankings are adjustable so that each institution can customize the ordering of search results. It can search any MARC field if it is configured to recognize. Spelling mistakes are noted and there is a "did you mean" suggestion feature. Although VuFind is not part of the ILS, Check in and Checkout status of item and member status is possible through Ajax calls that are made when an item's web page loads. The interface offers multiple languages to search records.

The latest version of Vufind is 1.2 released on August 01, 2011, under GPL open source license, users can download the software from the download site of Vufind (http://vufind.org/).

Library of Congress Subject Headings are being used as default in Vufind that makes each element of a subject heading a hyperlink to a search: the further to the left, the broader the search; the further to the right, the narrower. For example, the book "Winston Churchill (see figure 2 below) has one heading: ""Prime Ministers" ->"Great Britain"-> "Biography"." In our old catalogue, this entire string was one link, leading to other items with that exact heading. In VuFind, the three elements are separated and it is possible to follow "Prime Ministers" ->"Great Britain"-> "Biography" as a link. The ""Prime Ministers" " link leads to a search for all items with that subject. The "Great Britain" link leads to a search for all items with the subject "Prime Ministers" and "Biography. "Biography" leads to a search for all items with the full "Prime Ministers" ->"Great Britain"-> "Biography" subject.

Figure 2: Bibligraphic Record

VuFind displays search hits and sorts on bases of format, location, subject, author, language, and call number. These facets enables users to narrow large sets of search results to smaller more defined sets. At the individual record level, similar items are displayed based on the item title. This is extra feature of VuFind is the "similar items" list. VuFind allows tagging, commenting, keeping a list of favourites, and sending search results as text messages or email.
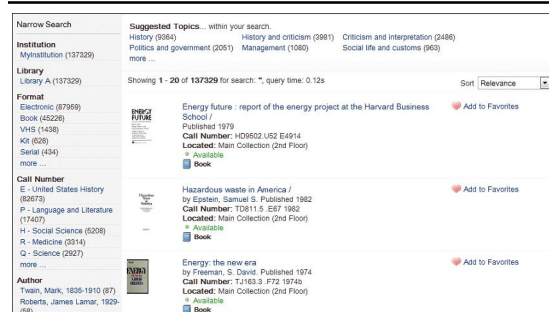

Figure 3: VuFind Catalogue

Figure 3 shows a screenshot of our VuFind catalogue where the top facets are visible on the left below are format, subject, call number, author and languages. The search results are on the right side with image of books.

There are three search tools such as RSS, E-mail, etc. at the end of search result. This search records and save the searches. (See Figure 4)
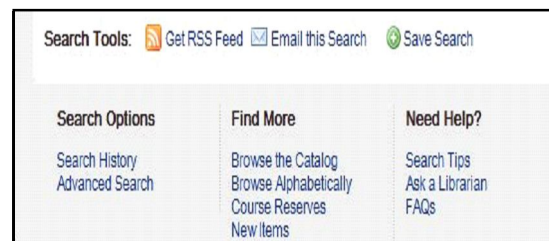

Figure 4: Search Tools

Subscribe RSS Feeds by clicking the button and subscribed the Feed.

Figure 6: RSS Feed

User will find four options under a record and they are holdings, description, comment and staff view. You can add comment going through comments.
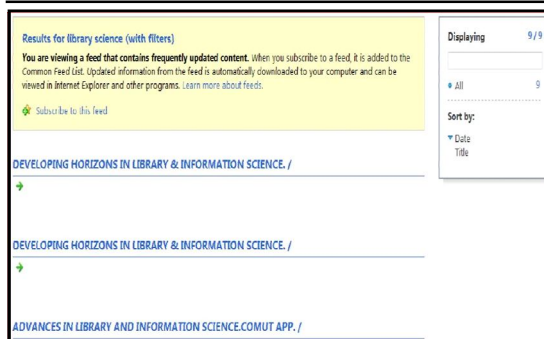
Figure 7: RSS

Description will provide you a physical description like total pages of book etc. (See Figure 8)

Figure 8: Description

By going to any particular record user will find this page also providing similar items with that search. With this user will have options to cite record, text facility, e-mail facility, export record and add to favourites on top of the record. (See Figure 9)

Figure 9: Export Feature

4.   Features of Vufind

Vufind is completely modular; one can choose to implement either just the basic system or all of the components as it is open source software.

❖ Faceted search results that allow users to narrow down items by format, call number, language, author, genre, era, region etc. Vufind allows user to search from a basic search box and then to be able to narrow down the results by clicking on the various facets of the results.

❖ Live Record Status and Location The search results page is able to display the present status of a record through the use of AJAX by querying the catalog at that exact moment.Since it is done through AJAX after the results have loaded, the page will not slow down for any reason.

❖ Similar Title suggested When viewing a record, the user will be offered suggestions of resources that are similar to the current resource and title

❖ Save Resources to Organized Lists The user has the ability to save the resources from both the search results page and from the record view page to their own customizable lists. The lists can be retrieved at any time and will always be there for the users. This helps to eliminate the need for desktop based citation management software that tends to be too difficult for basic users. This makes it simple for all users.

❖ Browse Resources The user has the facility to browse the catalog allowing them to search what the library has rather than only being able to get a very narrow spectrum of results.

❖ Author Biographies The user can get more about the author and his related information can

see all of the books that they have written in the library.

❖ Bookmarking and Tagging Vufind allows the user to bookmark their records to allow permanent access to a page they were once on. Your users can save and tagging any records with Zotero or COinS based application so they can store their records in one place.

❖ Support Open Search, OAI, Solr. VuFind has many APIs to interact with the search, data and extra features. One can pull record data with other library via an OAI server. One can search using Vufind's algorithms via Open Search, and if one wants full access to indexed data, one can interact with solr, VuFind's backend search and index engine.

5. Customization

As VuFind is Open Source Discovery Tool, it can be customized as per the requirement. To customize the features of VuFind, users must know the configuration options in its configuration files. VuFind can be customized to following levels:

❖ Customizing Facets

❖ Customizing User Interface

❖ Customizing Search

5.1 Customizing Facets

❖ VuFind queries generates facets same as the search results. As VuFind is using the SOLR, bibliographical index can be used to provide facets. This bibliographical index is being stored in "{path}/vufind/sorl/biblio/index".

❖ Facets can be configured as per user's requirement. One can configure the order of the

facets using VuFind. To customize the facets, one should edit the facet configuration file "/facet.ini" at "{path}/vufind/web/conf".

❖ To add the facets to search box, there are three possible scenarios given below:

a) Use the index which is already exists.

b) Directly indexing the MARC data as there is no index exists.

c) Translation needed

❖ The mapping of MARC fields with the SOLR index is given in "marc.properties" file located at "{path}/vufind/import".

❖ If one want to add facet in existing index then one needs to map the MARC fields and sub fields to an index in "{path}/vufind/import/marc.properties" file and create the index. Then it will expect re-indexing of whole database.

❖ In case of not existing currently index, data is encrypted and require to be translated into text strings using translation maps at "{path}/vufind/import/bin".

5.2 Customizing User Interface

Smarty templates for HTML(PHP) is used to develop VuFind and CSS is used for design purpose. For different designs, VuFind is having themes which include templates and CSS. Different themes are located in directory "{path}/vufind/web/interface/themes". One can use the default theme of VuFind or built-in theme available in VuFind as well as one can create their own theme. For changing the theme of VuFind interface, one needs to change configuration in its configuration file "config.ini" located at "{path}/vufind/web/conf".

❖ **Theme Inheritance:** Theme inheritance is supported by VuFind. With this one can set other theme by configuring "{path}/vufind/web/config/config.ini" by using comma separated list of theme names. Local customization can be managed using this theme inheritance.

❖ **Cascading Style Sheets(CSS) Inheritance:** Designing and formatting of document in VuFind interface is managed by Cascading Style Sheets(CSS). CSS is generally used to describe presentation. By using CSS, one can set the style of HTML and XHTML web pages. Smarty function is used to apply CSS successfully.

❖ **Image Inheritance:** One can customize images which is using functions of smarty and CSS using Image Inheritance. To configure images, one can set the images in directory "{path}/vufind/images".

❖ **Javascript Inheritance:** This is newly added feature after VuFind 1.1 which includes a Smarty tag that works like CSS tag. "web/js" folder contains all javascript files. The javascript tag will first search their js folder for theme. If requested file is not found then the web/js folder in the root will check the last resort.

5.3 Customizing Search

❖ **Search Interface Customization:** Simple and advanced search options can be customized through web/conf/searches.ini where separate sections of both the types are available.

❖ **Autocomplete Function:** To enable/disable this autocomplete functionality, one needs to change settings in "searches.ini" file located at "web/conf/".

❖ **Alphabetical Heading Browsing:** Vufind provides a traditional alphabetical heading browse system using Alphabetical Browse (AlphaBrowse) module which allows users to get all of the titles, authors and subjects, including cross-indexes expressed by authority information. For generating heading lookup correctly, one needs to add one step while generating index file of database.

❖ **Generating Heading Databases:** Command –line tool is needed to build the databases used for heading lookup. In windows operating system, open VuFind root directory and run "index-alphabetic-browse.bat" file and restart VuFind to see effects in headings.

6. Conclusion

VuFind interface offered many improvements over classic OPAC. Vufind is having all the facilities like faceted navigation, similar and recommended titles, Web 2.0 features. It is more beneficial and advanced compare to traditional library catalogue. We can put it in a line of next generation catalogue. Thus, it fulfils all the desired features of a knowledge discovery tool. VuFind can be considered as a step forward knowledge discovery tool.

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