Next Generation of Catalogues: A Comparative Analysis of OPACs of University Libraries in India

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Abstract:

The Next Generation Online Public Access Catalogue (OPAC), generally termed as OPAC 2.0, is the results of continuous rethinking and reworking to make the information retrieval more effective, efficient and elegant with improved searching experiences. This paper attempts to list the OPAC functionalities by studying the OPAC 2.0 features available in representatives of all three types of software – commercial, open source and free. This paper attempts to compare the features available in the OPAC of ten universities against the listed expectations. Effort is also made to understand the level of OPAC 2.0 in the software adopted by these universities for integration of e-Resources, and interoperability standards.

Keywords: *OPAC, Information Retrieval, OPAC 2.0., Library Automation, Online Catalogue.*

Introduction

OPAC, as a distinct module of the Integrated Library System (ILS), made its appearance substantively in the mid-1980s (Haravu, 2004). OPAC primarily plays its crucial role as a window to access bibliographical information of a library collection. OPAC basically fulfills two functions – identifying the documents in the database that matches with search term(s); and, getting the information to locate



or access the documents.

The last decade has seen the considerable development in the ILS industry. The discovery services, federated searching, integration of databases, interoperability, search engine architecture, etc., seen in OPAC has made people in the commercial ILS industry to spend much on R&D to incorporate the features in their systems also. The developers of ILS have executed ambitious, innovative agendas to extend and integrate new advancement in OPAC features to challenge the OPAC user expectations. Seamless e-Book integration, web-based interfaces to access Open Access Resources, built-in social networking capabilities, etc., were projected as the “soon in your software'' column by many ILS like Voyager, Millennium, Horizon, Virtua, Symphony, Polaris and Apollo, to name a few.

Open Source Integrated Library Systems (OS ILS) developers were no different. The names such as Evergreen (www.open-ils.org), Koha (www.koha.org), NewGenLib (www.newgenlib.com) and Open Source Library Automation Systems (OPALS) (www.opals-na.org) have been doing the rounds in library circles and in the literature, mailing lists and librarians' blogs. Each of these efforts began as projects sponsored by many interested institutions/partners. These are now available, operational and accessible as open source offerings under the GNU GPL system. Breeding's article (2012) covers the history, growth and features of Koha, Evergreen, OPALS and NewGenLib in a sweeping review. The development of OSILS products has created its own space in the Request for Proposals (RFPs) or Library Automation Proposals. The ILS industry report (Breeding, 2013) claims that the features offered are on par with many commercial ILS which has made many libraries to migrate from commercial to OSILS.

While functionality and user-friendliness are still vital, the authors argue that following aspects can be considered in identifying ILS:

- How responsive the OPAC Module is in addressing data integration, interoperable standards and information synchronization?
- How promising is the software in becoming a part of the social web?
- How open is the software to allow libraries to customize to suit special needs and other applications to connect with it?
- How suitable is the software for adopting to the different environments (such as public, academic and special libraries) as well as to meet the different cultural requirements?

Using OPAC as the distinct user-service module, the study has focused on identifying the features needed to extend the user-centric facility. With this focus in mind the study is carried out with the following objectives:

1. To list the OPAC functionalities by studying the OPAC 2.0 features available in representatives of all three types of software – commercial, open source and free.
2. To compare OPACs of 10 different universities as against the listed expectations, and to understand the level of OPAC 2.0 implementation, integration of e-Resources, and interoperability standards.
3. To know the status of university OPACs in India when evaluated against the essential criteria of a Next Generation OPAC (NGO).

Methodology

This study has adopted an analytical approach to understand the Next Generational Catalogue features available in select Indian University OPACs. The analysis is based on the listed criteria and the candidates considered. Further, to have clarity and transparency a proper approach for evaluation was followed and they are as under:

1. The study is based on the works by Mercun & Žumer (2008), Ballard & Blaine (2011), Luong & Liew (2009), Naun (2010), Tam & Bussey (2009), Yang & Wagner (2010), Yang & Hofmann (2011). These works helped the authors to identify the functional features of OPAC 2.0 and to prepare a checklist for evaluation.

   Amazon carriers have often been mentioned as the model for what the library catalogue should look like, by both librarians and users. Also, we can see concurrently discrepancies too (Murcun and Zumer, 2008). Hence, the authors have considered some of the features available in Amazon and Flipkart, to identify the evaluation criteria.

2. To have a 'Reference model for an OPAC' against which other candidates can be compared for evaluation, the authors visited OPACs which have adopted the web 2.0 technologies. Based on observations and preliminary studies it was found that the Phoenix Public Library OPAC is offering several functionalities. Hence, the study has adopted Phoenix Public Library OPAC as the 'Reference model for OPAC' to assess the OPAC features available in top 10 university OPACs in India.

Some of the features available in Phoenix Public Library OPAC are identified and presented below as Figures 1 & 2. These available features will act as a reference in understanding what we can expect in an NGO or OPAC 2.0.

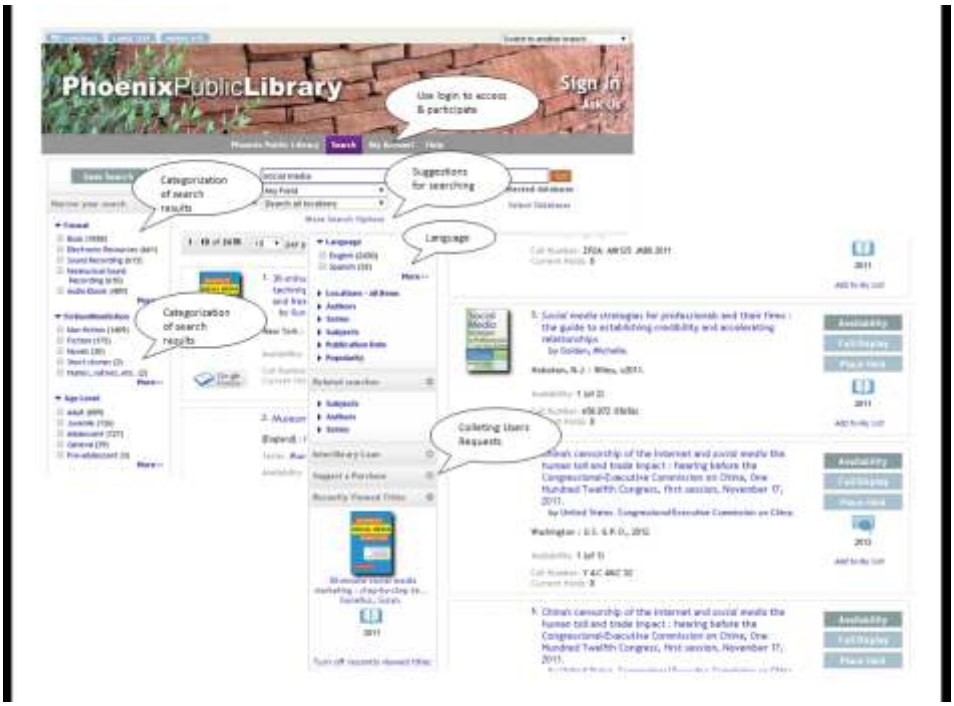


Figure 1: Search result display and features available
Source: http://catalog.phoenixpubliclibrary.org/



Figure 2: Availability of features for individual record display
Source: http://catalog.phoenixpubliclibrary.org/

3. The 'Handbook of Universities' (Gupta & Kumar, 2006) is considered as the source to identify the list of Universities in India (both State and Central Universities). To arrive at a list of 10 Universities which possess OPAC on the Public Domain, the authors had to check 54 universities listed in the source. Only the following universities have OPACs and hence considered for the study. The list of universities considered in this study are as follows:

List of Selected Universities in India

S.N.	University Name	Code	Year of Est.	Type of University	ILS Used
1	University of Mumbai Mumbai	MUM	1857	State	SOUL
2	University of Calcutta Kolkata	UOC	1857	State	SOUL
3	Aligarh Muslim University, Allahabad	AMU	1875	Central	LibSys
4	University of Mysore Mysore	UOM	1916	State	Koha
5	Osmania University Hyderabad	OUH	1918	State	NewGenLib
6	University of Delhi New Delhi	UOD	1922	Central	Home Grown (Comtek Services Pvt. Ltd.)
7	The Maharaja Sayajirao University of Baroda Vadodara	UOB	1949	State	SOUL
8	Karnatak University Dharwad	KUD	1949	State	Koha
9	Gujarat University Allahabad	GUA	1949	State	SOUL
10	Saurashtra University Rajkot	SUR	1967	State	SOUL

4. The authors adopted following indicators to describe the presence of evaluation elements in candidates:

Rank	Meaning
0	Unacceptable/No
1	Poor/if attempt is seen
2	Acceptable/feature with minimum or basic information
3	Good/Application with sufficient features for University libraries
4	Excellent/above expectations/with additional features/Yes

Based on the candidate's scores in each of the categories, the authors discussed the performance.

In general OPAC is termed or tied to online version of library's main catalogue, restricting the user to search or browse through the collection and status housed in the library. With the emergence of the concept 'Discovery Services' libraries and ILS developers started efforts in integrating the social web, digitized materials, e-Resources, open access resources, IR materials, etc., with OPAC.

It is found that the diffusion of digitisation and digital library repositories has urged libraries to digitise their content and provide content directly through various digital library systems (Dempsey, 2006). To encourage users to organise and access the existing resources according to their needs, libraries have enhanced their services using Web 2.0 technologies (Golder & Huberman, 2006). Keeping the users expectations in fore, the present day OPAC - with a strong search engine and database structure, should offer access to the patron a highly evolved Web 2.0 features with Social Networking synchronization, making it OPAC 2.0.

The Next Generation OPAC, generally termed as OPAC 2.0 is expected to offer highly elaborated searching experiences through configurable relevance ranking; subject tag maps or clouds; clustering or faceting for filtering; expanding search results; suggestions for additional searching based on authority headings; indexing of data from several sources (for most popular items – the circulation data may be considered); incorporating results from federated search & OpenURL linking; spelling corrections using the catalogue database contents and community or user reviewing and tagging; etc. With these expectations in OPAC 2.0, authors tabulated the performance of top 10 universities OPAC with the 'Model of the Reference OPAC'.

The identified features and functionalities are grouped into - basic features, search, result page and navigation, enriched content & recommendations, user participation, user profile & personalisation, and such other performance trends. The performance of each of the OPAC in these categories, the score and the grand total is presented above in Table 1.

	Phoenix	MUM	UOC	AMU	UOM	OUH	UOD	UOB	KUD	GUA	SUR
1. Basic Features											
MARC21	4	3	0	4	3	4	0	3	3	3	0
ISBD	4	3	0	4	3	0	0	3	3	3	0
Normal View	4	3	0	4	3	4	3	3	3	3	4
General View	4	0	3	0	3	3	0	0	0	0	0
Types of materials catalogued	4	2	3	4	4	2	3	4	4	3	0
Unicode language access points	4	0	0	4	4	3	0	4	3	0	0
Total	**24**	**11**	**06**	**20**	**20**	**16**	**06**	**17**	**16**	**12**	**04**
2. Search											
Simple search box as available in general search engines	4	4	3	3	4	4	3	4	4	4	3
Spell checking & Suggestions	4	0	0	0	0	0	0	0	0	0	0
Begin search by browsing	4	3	3	4	4	4	3	3	4	3	3
Full-text searching	0	0	0	2	4	0	0	0	0	0	0
Total	**12**	**07**	**06**	**09**	**12**	**08**	**06**	**07**	**08**	**07**	**06**
3. Result pages and navigation											
Relevance ranking &Clustering	4	2	2	3	3	3	0	3	3	3	0
Navigation	3	0	0	0	1	0	0	0	0	0	0
Recommendation to other resource available on open or subscribed e-Resources	4	0	0	0	2	0	0	0	0	0	0
Total	**11**	**02**	**02**	**03**	**06**	**03**	**00**	**03**	**03**	**03**	**00**
4. Enriched content and recommendation											
Cover art images collected from Google books, etc.	4	0	0	0	4	4	0	0	0	0	0
Sharing of resource on social networking platforms like facebook, twitter, etc.	3	0	0	0	0	0	0	0	0	0	0
Summaries/annotations	4	0	0	0	0	0	0	0	0	0	0
Excerpts (author review, reviews on social networking platforms, etc.)	3	0	0	0	0	0	0	0	0	0	0
Tables of content and linking of resources	4	0	3	0	3	3	0	0	3	0	0
New items, most popular, recently returned items and recommendations lists	4	0	0	3	3	3	0	0	3	0	0
“More like this”	4	0	0	0	0	0	0	0	0	0	0
Audio in video content	4	0	0	0	0	0	0	0	0	0	0
Total	**30**	**00**	**03**	**03**	**10**	**10**	**00**	**00**	**06**	**00**	**00**
5. User participation											
Ratings and reviews	4	0	0	0	0	2	0	0	0	0	0
Comments	4	0	0	0	0	0	0	0	0	0	0
Tags	4	1	1	1	3	3	0	0	3	1	0
Forum	4	0	0	0	0	0	0	0	0	0	0
Total	**16**	**01**	**01**	**01**	**03**	**05**	**00**	**00**	**03**	**01**	**00**
Grand Total	**143**	**21**	**18**	**37**	**64**	**56**	**12**	**27**	**52**	**23**	**10**

Performance analysis:

The OPACs of 10 universities are evaluated using the 5-point normal Scale as detailed in the methodology section. The results are mapped to the 'Reference Model', i.e., the Phoenix Public Library OPAC (URL: https://www.phoenixpubliclibrary.org/).

The INFLIBNET offered software - Software for University Libraries (SOUL) – is adopted by 5 universities which include University of Mumbai; University of Calcutta; The Maharaja Sayajirao University of Baroda, Gujarat University; and, Saurashtra University. It is observed that 3 universities are using Open Source ILS Koha namely - University of Mysore; and NewGenLib by Osmania University & Karnatak University. The commercial software – LibSys & Comtek Services Pvt Ltd are providing ILS service to Aligarh Muslim University and University of Delhi. The shortlisted OPACs for the study gave an opportunity to authors to look into functionalities and features in all the 3 flavours of the software categories – Commercial, Free software and Open Source Software.

The authors have shared the observation made on each of the categories presented in Table 1 as follows:

Basic features: The basic features and the display of bibliographic records are considerably well established in all the OPACs. However, the OPAC offered by SOUL adopted by the University of Mumbai; University of Calcutta; Maharaja Sayajirao University of Baroda; Gujarat University; and, Saurashtra University; needs considerable improvement pertaining to style, display format, exporting bibliographical data (both ISO 2709 & Tabular form), links to external source, options for variable display formats, etc. The open source OPACs by the University of Mysore, the Osmania University and the Karnatak University have performed equally well with the commercial offering – LibSys and Comtek Services Pvt Ltd adopted by the Aligarh Muslim University and the University of Delhi.

Search: It is observed that the Koha has good search and display facilities almost on par with the 'Reference model' considered for this study. Other systems lag behind. The availability of the search option, supports available to users, to place the search term, the display of results and the ability to retrieve the relative documents are examined in this category.

Result page and navigations: The presentation and display of search results and the navigation facility available to access the information about the resource and

the add-on or accompanied resources (both hard copy and electronic resources) are considered in this category. It is observed that none of the Indian universities has considered the customisation or presentation in line with the requirements of the Next Generation OPAC. Even though they have scored considerably well in the clustering of search results and ranking, they failed to perform in navigation features. Furthermore, besides the ability to integrate or to obtain interoperability feature to provide direction to the Open Access or Subscribed e-Resources are not conspicuous in any of the OPAC used in Indian universities. However, effort in linking e-Resources in OPAC under Tag 856 is noticed by the authors.

Enriched contents and recommendation: The enhanced or value added services to the search results are essential in NGOs. The links leading to essential or appropriate e-Resources to an information source, gathering information from different social media network sites, recommendations to the users in the area of search, sharing of content contributed by the user community are the value additions which enrich the content displayed in OPACs. In this category, the performance of OPACs used in Indian universities is highly disturbing. Some efforts were taken by the University of Mysore, the Karnatak University and the Osmania University OPACs to employ Open Source software – Koha and NewGenLib respectively.

User participation, User profiles and Personalisation: The 5th and 6th categories closely related to the user participation in OPACs are considered in this section. The primary objective of the NGO is to generate OPAC as being useable-centred, and frame it into a better interactive system between the library and its concerned patrons. In these two categories the authors considered the key activities which make the users to spend time with their library OPACs. Based on the results, the author opines that the Indian universities failed to cater to the key objective which is user participation. The low performance of all the OPACs and user's non-participation even though the feature is available at the University of Mysore's, the Karnatak University Koha OPACs and the Osmania University's NewGenLib OPAC reveal that the University Information Literacy Program has not considered user participation in OPACs as a serious affair.

Other trends: Koha and NewGenLib OPACs employed by the University of Mysore, the Karnatak University and the Osmania University respectively have used RSS feeds. However, even though Koha bears rich features to allow synchronization of

data from different social networking platforms, its usage has not been attempted by the University of Mysore and the Karnatak University. Attempts by the other 7 universities are not seen in opting and taking initiatives to bring the current social trends in OPACs.

This study adds on some key features and criteria to the list framed to evaluate OPACs. The social networking, synchronization, the use of web 2.0 technologies and interoperability of software are considered as key elements which comprise the existing monolithic OPAC, the Next Generation OPAC (NGO). The performance score by the Indian universities OPACs is not encouraging. The University of Mysore and the Karnatak University OPACs on Koha have made attempts to bring in some of the features which are present in the OPAC 2.0. However, Open Source Koha has many features which can offer much more to the digital native citizens or users. The Osmania University OPAC has performed closer to Koha OPAC yet; it could not match both the University of Mysore and the Karnatak University in terms of users' participation features, search results display and to any extent in basic features too. The software NewGenLib needs to come out from the client server architect model and reformulate the browser model. This switch over will certainly the open door to bring in several features listed for evaluation. LibSys bearing a commercial index and having a global presence has failed to perform as per the expectations of the authors. The latter assumed its performance to match that of Polaris adopted by the Model of Reference. The SOUL offered by INFLIBNET could not function well in any of the listed categories. The performance of the OPAC features in SOUL has to be updated to a greater extent and considerable research is expected in the software environment.

It is observed that Koha OPAC's performance is considerably much evolved when compared to other commercial, OSS and Home Grown products. User Participation features in Koha could not be evaluated due to non-availability of data. This clearly indicates that Indian universities should work on making OPAC user friendly and effort should be made to market the same as a gateway to access information.

Conclusion

A commendable development that will undoubtedly influence the future course, not only for the open source ILS, but also with regard to the commercial vendor offerings, is the content aggregation from Social Networking Platforms. The

ability of software and the service provider to identify, integrate and build their service offering will definitely yield a good result. As reported in many surveys and studies traced in the literature review, libraries should focus more on 'Content Development' than 'Acquiring the Content'. Further, the authors feel they should focus on 'Content sharing through OPAC'.

The take away of this study is that Open Source OPAC has made an effort to move towards the Next Generation OPACs and the selected Universities should concentrate on the integration of resources and user participation. The commercial software should integrate the Open source tools, adopt interoperable standards and build the software to interact with the social networking platforms and retrieve the content. The free offerings should join hands with the Open Source Software to offer the customized services to the Indian Universities.

References:

Aligarh Muslim University (1875). Retrieved September 11, 2015, from http://webopac.amu.ac.in:8080/opac/

Ballard, T., & Blaine, A. (2011). User search-limiting behaviour in online catalogs: Comparing classic catalog use to search behaviour in next-generation catalogs.New Library World, 112(5/6), 261-273.

Breeding, M. (2014).Perceptions 2013: an International survey of library automation. Retrieved from http://www.librarytechnology.org/perceptions2013.pl

Calcutta University Library. (1857). Retrieved September 20, 2015, from http://www.caluniv.ac.in/opac/index.html

Delhi University Library. (1922). Retrieved September 20, 2015, from http://dulsopac.du.ac.in/Default.aspx

Dempsey, L. (2006). The library catalogue in the new discovery environment: Some thoughts. Ariadne, (48), 4.

Golder, S. A., & Huberman, B. A. (2006). Usage patterns of collaborative tagging systems. Journal of information science, 32(2), 198-208.

Gujarat University Library. (1949). Retrieved September 20, 2015, from

http://14.139.122.29/webopac/main.aspx

Gupta, A., & Kumar, A. (2006).Handbook of universities (Vol. 1, p. 472). New Delhi: Atlantic & Distributors.

Gupta, A., & Kumar, A. (2006).Handbook of universities (Vol. 2, p. 897). New Delhi: Atlantic & Distributors.

Haravu, L.J. (2004). Library automation: design, principles and practice. New Delhi: Allied Publishers.

Karnatak University Library. (1949). Retrieved September 20, 2015, from http://kul-koha.informindia.co.in/

Luong, T., & Liew, C. (2009). The evaluation of New Zealand academic library OPACs: A checklist approach. The Electronic Library, 27(3), 376-393.

Madhusudhan, M., & Aggarwal, S. (2011). Web-based online public access catalogues of IIT libraries in India: an evaluative study. Program: electronic library and information systems, 45(4), 415-438.

Mercun, T., & Žumer, M. (2008). New generation of catalogues for the new generation of users: a comparison of six library catalogues. Program: electronic library and information systems, 42(3), 243-261.

Mumbai University Library. (1857). Retrieved September 20, 2015, from http://121.241.25.77/soulwebopac/main.aspx

Mysore University Library System catalog. (1916). Retrieved September 20, 2015, from http://libcatmysore-koha.informindia.co.in/

Naun, C. C. (2010). Next generation OPACs: A cataloging viewpoint. Cataloguing & Classification Quarterly, 48(4), 330-342.

Saurashtra University Library. (1967). Retrieved September 20, 2015, from http://14.139.121.46/SOULWEBOPAC/main.aspx

Tam, W., Cox, A. M., & Bussey, A. (2009). Student user preferences for features of next-generation OPACs: a case study of University of Sheffield international students. Program: electronic library and information systems, 43(4), 349-374.

The Maharaja Sayajirao University of Baroda Library. (1949). Retrieved September 20, 2015, from http://14.139.121.106/webopac/Default.aspx

Welcome to Osmania University Library. (1918). Retrieved September 11, 2015, from http://14.139.82.46:8080/newgenlibctxt/

Yang, S. Q., & Wagner, K. (2010). Evaluating and comparing discovery tools: how close are we towards next generation catalog?. Library Hi Tech, 28(4), 690-709.

Yang, S. Q., & Hofmann, M. A. (2011).Next generation or current generation? A study of the OPACs of 260 academic libraries in the USA and Canada. Library Hi Tech, 29(2), 266-300.