Library automation with cloud based ILMS Librarika: case study of Central University of South Bihar

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Introduction

In recent decades, changes in processors, virtualization, distributed storage mechanisms, automated management, broadband internet accessibility and availability of fast and inexpensive servers have made computing in the cloud a compelling paradigm. Most library professionals face problems in the installation of software, server management, checking for updates and configuration management, which has nothing to do with the core mission and services of library (Yuvaraj, 2015a, 2015b). Even if the library software is launched, due to lack of necessary infrastructure, complexity of software and lack of highly skilled library professionals, Online Public Access Catalogue (OPAC) management is difficult. With the emergence of cloud-based library management systems, IT support including installing hardware or the upgradation of systems is circumvented. (Yuvaraj, 2015a, 2015b).

One such cloud library management system is Librarika (2016), which has all the strengths required to manage, administer and access the library through the web, anytime and anywhere in the world without the need to purchase, install or configure the software in the library. The core features available in Librarkia are built-in OPAC; smart add (instantly add book using ISBN from the internet); unlimited member of registrations; patron login; check-ins/checkouts, reviews, ratings, online reservation and access history; barcode reader-friendly; data export and import; as well as an easy integration widget for websites. Due to these endless possibilities, libraries of academic institutions such as Presidency University, America Bangladesh University and Metropolitan College, to name a few, are slowly adopting Librarika as a low-cost library management solution. The present paper is an attempt towards carrying out an evaluative study of the adoption of cloud-based ILMS Librarika in the Central University of South Bihar, so that other libraries in India and elsewhere are motivated to adopt the solution.

Cloud computing has become an attractive option for organizations, like libraries, that would prefer to concentrate on their core mission rather than IT issues (Wale, 2011). Shifting library core applications to cloud-based services will reduce or eliminate most or the entire local technical needs in managing server hardware and operating systems that underlie the applications (Liu and Cai, 2013). Cloud computing brings along economies of scale and overall administration (Wale, 2011). Cloud computing not only benefits individual end-users and companies but also attracts libraries in many ways when they must cope with budget cuts and constrained financial resources (Liu and Cai, 2013). Implementation of cloud computing can enable more energy-efficient use of computing power when computing tasks are of low intensity or arise infrequently (Baliga *et al.*, 2010). Marston *et al.* (2011) feel that the impetus for change right now is seen predominantly from a cost perspective, as organizations increasingly discover that their substantial capital investments in information technology are grossly underutilized.

Cloud computing enables new streamlined workflows for cooperation and community building among libraries (Goldner, 2011). According to Sultan (2010), cloud computing can provide colleges and universities with a means to upgrade software and IT hardware attracting students and keeping pace with digital technological developments. Scale (2010) puts forth his view that cloud computing is currently enabling librarians to shift from the paradigm of ownership and maintenance of resources towards the provision of access to information maintained and controlled by others. Although, cloud computing involves more responsibilities and obligations of the service provider and the client library need worry only about such things as local bandwidth, hardware client (PCs) and software configuration (Prince, 2012). According to Sorensen and Glassman (2011), cloud-based applications offer libraries new ways to present information or offer services that were previously unaffordable or unavailable.

Patel *et al.* (2012) have enlisted four core areas of cloud computing solutions in libraries: technology, data-hosting archives, information and community. Simultaneously, various scholars have argued that cloud computing was already in practice before the concept gained momentum and there are ample possibilities in the future. Hoy (2012) asserts that many library patrons are already using cloud products such as Gmail, Google Docs and bibliographic management tools for their daily needs. Cohn *et al.* (2002) believe that libraries use database vendors or integrated library system providers who provide external servers to host library software and data in the cloud. Romero (2012) argues that in the field of library automation, there are several commercial suppliers already offering various adaptations of their products which make the use of the cloud possible to a lesser or greater extent. According to Prince (2012), some of the cloud-based options

for libraries include IaaS- or PaaS-hosted ILS systems in which libraries buy their ILS software from one vendor and host it on another vendor's servers. Major ILS vendors exclusively having Software as a Service (SaaS) deployment options for libraries are ExLibris, VTLS and Cyber Tools.

Commenting on the future prospects of cloud-based library services, Wale (2011) argues that discovery tools can be embedded in commonly used applications such as course management systems and institutional portals, enabling libraries to meet the needs of users wherever they are. According to Luo (2013), virtual reference services and research guides can be provided in libraries through software such as LibChat, QuestionPoint and LibGuides, which are all hosted on the cloud. Also, librarians in many developing countries are disadvantaged, encountering connectivity challenges because funding cloud computing platforms or enhancing bandwidth are not always priorities in these regions, as there are more urgent problems for funders to deal with, such as hunger (Mavodza, 2012). To develop a cloud-based library, there is a need of librarian training and practice to address the issues of cloud realities. However, the biggest impediment to adoption of cloud computing is the lack of some functionality of traditional solutions. (Marston *et al.*, 2011). In spite of these impediments, cloud computing solutions can be lucrative options for small libraries which do not have enough IT infrastructure. In present years, adoption of ILMS in libraries has emerged to be an unavoidable situation for all types of libraries to automate in-house library operations and serve users in an effective manner. Librarika is one such ILMS, which is based and hosted in the cloud which does not require any software or server for hosting purposes that can be used by libraries for automation purposes at no cost for a small collection.

Librarika

Librarika was launched in 2011 as a SaaS-based integrated library automation package hosted in the cloud from The Netherlands by Digital Ocean, Inc. It is developed by Raynux enterprises, which are dedicated to developing web applications, web services, e-commerce, mobile services, etc. Google Analytics reveals that on an average per day, there are 498 unique visitors and 996 page views of Librarika. Librarika is a straightforward and easy library management system in the cloud which does not involve any expertise to deploy the software and no installation and maintenance burdens. It is available for free only for 10,000 titles or records which have acquisition, circulation, cataloguing, report generation and user management modules. It offers a web-based platform for administration and management of library records. It has an automated data-handling technique which fetches book covers as well as bibliographic data from sources across the globe. Figures 1 and 2 show the OPAC and staff interface of Librarika adopted at the Central University of South Bihar (2015).

In our study, we wanted to evaluate the different modules and features of cloud-based ILMS Librarika, determine the perception of library professionals with Librarika and examine its advantages and disadvantages. The success of any automation project depends largely on the dedication and commitment of staff. A questionnaire was used as a data collection method.

Figure 1. *OPAC interface of Librarika*

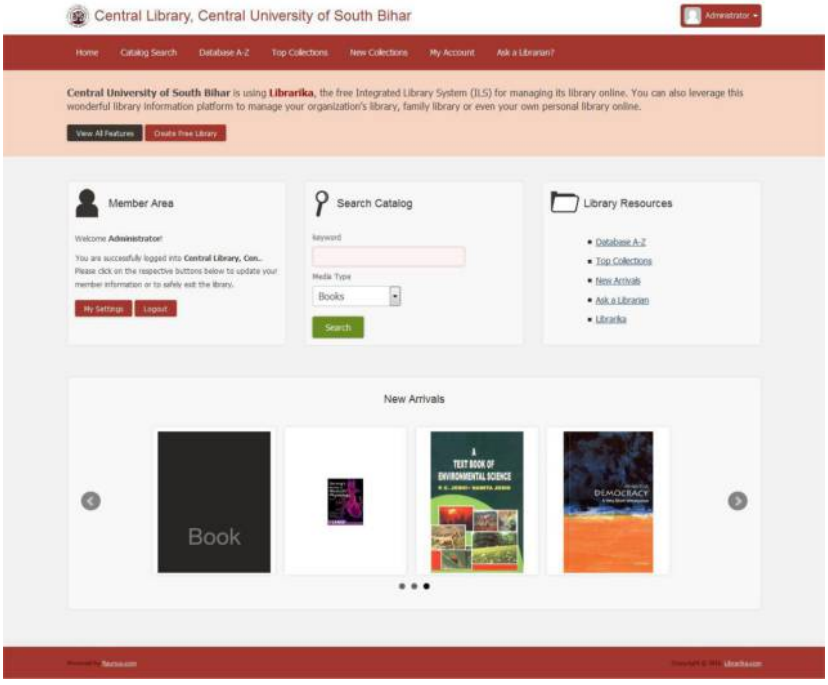
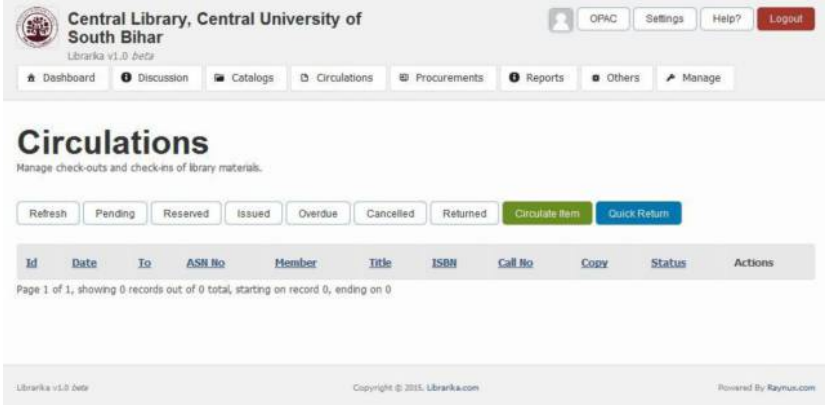


Figure 2. *Staff interface of Librarika*



Only the professional assistant, junior/semi-professional assistants and library assistants using Librarika were involved in the study. A checklist was prepared to evaluate and compare the features offered by cloud-based ILMS Librarika. Overall, ten library staff participated in the study. The responding staff agreed and disagreed on various features of Librarika, out of which only the majority points were considered. All the selected major or minor elements of cloud-based ILMS Librarika were rated on five scales: very good, good, fair, poor and very poor, by the respondents.

Staff evaluation Librarika

Table I presents a snapshot of different attributes, qualities as well as features inherent within Librarika and the level of satisfaction ranked by the respondents. Analysis reveals that majority of respondents (86 per cent) consider multi-user support and the user friendliness (78 per cent) as the key characteristics of Librarika.

After the in-house operations of the library are automated, different modules of the ILMS have to be completed for the workflow. To get a clear picture of cloud-based ILMS, Librarika respondents were asked to rate the various modules. Table II represents the opinion of users regarding the various modules and shows that Librarika offers one of the best modules in OPAC (99.97 per cent), cataloguing (98.34 per cent) and circulation (91.86 per cent).

Prior to adopting any ILMS software, it is obligatory to have knowledge of the support services, maintenance and additions extended by the service provider to the end-user. Table III enlists the ranking of various support services offered by Librarika. Majority of respondents find a poor support system provided by the service provider. Highly ranked support services were discussion forums (66.21 per cent), error references (61.38 per cent), emails (54.18 per cent) and updates (51.24 per cent). To gain the confidence of the librarians and the libraries in terms of any IT-based solutions, support services are prerequisite.

Table I.
Characteristics of Librarika (n = 10)

Characteristics	Mean	Proportional mean	Test value	*P*-value	Rank
Multi-user support	4.91	86.89	9.62	0.000*	1
User-friendly	4.52	78.68	8.73	0.000*	2
Flexibility	3.52	70.12	7.66	0.000*	3
Comprehensiveness	3.47	69.82	7.12	0.000*	4
Transparency (unrestricted use)	3.41	66.72	6.88	0.000*	5
Price	2.52	64.27	6.52	0.000*	6
Interoperability	2.48	63.92	6.22	0.000*	7
Expandability	2.42	59.14	5.54	0.000*	8
Active development status	2.26	57.24	5.32	0.000*	9
Multi-lingual support	1.32	49.46	4.47	0.000*	10

Note: * is used to denote the *p*-value

Table II.
Different modules of Librarika (n = 10)

Modules	Mean	Proportional mean	Test value	*P*-value	Rank
OPAC	4.99	99.97	9.98	0.000*	1
Cataloguing	4.97	98.34	9.86	0.000*	2
Circulation	4.92	91.86	9.38	0.000*	3
Patrons	4.41	86.48	8.84	0.000*	4
Serials	2.48	67.42	6.82	0.000*	5
Acquisition	1.49	52.46	5.46	0.000*	6
Report generation	1.34	44.27	4.21	0.000*	7

Note: * is used to denote the *p*-value

Table III.
Support services (n = 10)

System support facility	Mean	Proportional mean	Test value	*P*-value	Rank
Blog	–	–	–	–	0
Wiki	–	–	–	–	0
FAQ	–	–	–	–	0
Telephone	–	–	–	–	0
Troubleshooting	–	–	–	–	0
Help desk	–	–	–	–	0
Social networking	–	–	–	–	0
Real-time chat	–	–	–	–	0
Presentations	–	–	–	–	0
Training	–	–	–	–	0
Instant messaging	–	–	–	–	0
User reference manuals	–	–	–	–	0
Demo	–	–	–	–	0
Tutorials	–	–	–	–	0
Discussion forums/mailing lists	2.42	66.21	6.21	0.000*	1
Error references	2.36	61.38	6.12	0.000*	2
Email	1.52	54.18	5.38	0.000*	3
Updates	1.48	51.24	5.12	0.000*	4

Note: * is used to denote the *p*-value

There are various enhanced features which may not be provided by the ILMS service provider but can be offered in the library through the help of external web services. These enhanced features increase the functionality as well as the usability of the ILMS. Table IV shows various enhanced features. A greater number of respondents felt that Librarika lacked enhanced features over open-source ILMSs; however, it had good tagging and table of contents display functions. Respondents selected table of contents display (89.12 per cent), browser compatibility support (79.12 per cent) and tagging (76.24 per cent) as highly ranked enhanced features of Librarika.

Cloud-based ILMS software like Librarika offers numerous advantages. Through web-based computing, unlike desktop computing, the cloud-based platforms free IT staff from infrastructure maintenance, application development, software configuration and updating. Table V summarizes the various benefits from the adoption of cloud-based ILMS platforms in a library setting. Respondents ranked ubiquitous availability (96 per cent), quick deployment (92 per cent), smart add (88 per cent), scalability (84 per cent) and biblio data integration (81 per cent) as the primary benefits of adopting Librarika.

Although cloud-based platforms are hyped as an IT total solution, there are many perils to the adoption of cloud computing-based solutions. Table VI briefs the various problems that the respondents encountered during the course of using Librarika. It was found that security of data (94 per cent), reliability (90 per cent), lack of standards (87 per cent), connection dependence (82 per cent), loss of IT control and ownership (80 per cent) and data centre location (77 per cent) are some of the highly ranked barriers while adopting Librarika.

Librarika has both merits and demerits. Respondents were asked to point out some possible improvements that could improve the confidence of other libraries in adopting this ILMS solution. Table VII details some of the desirable features that could be incorporated in the future. Respondents point out that portability of data and applications (96 per cent), defined rules

Table IV.
Enhanced features (n = 10)

Enhanced feature	Mean	Proportional mean	Test value	*P*-value	Rank
Addition of new feature	–	–	–	–	0
Data confidentiality	–	–	–	–	0
No dues certificate	–	–	–	–	0
Table of contents	3.46	89.12	8.42	0.000*	1
Browser compatibility	3.24	79.12	8.12	0.000*	2
Tagging	2.48	76.24	8.04	0.000*	3
Full-text searching	2.42	74.24	7.34	0.000*	4
Patron services	2.29	71.76	7.15	0.000*	5
Useful links	1.42	62.14	6.21	0.000*	6
Shelf maps	1.22	56.24	5.62	0.000*	7
Multi-security layers	1.14	44.18	4.41	0.000*	8

Note: * is used to denote the *p*-value

Table V.
Benefits of using Librarika

Benefits	Rank	(%)
Ubiquitous availability	1	96.0
Quick deployment	2	92.0
Smart add – Instantly add book using ISBN from the internet	3	88.0
Scalability	4	84.0
Biblio data integration with Open Library	5	81.0
Ease of software integration	6	76.8
Device diversity	7	74.2
Location independence	8	73.8
Online book reservations	9	72.5
Universal login (members/patrons)	10	71.7
Increased collaboration	11	69.7
Cost efficiency	12	68.4
User's review and ratings	13	62.8
Automatic updates	14	60.4
Environmentally friendly	15	59.8

Table VI.
Problems encountered while using Librarika

Problems	Rank	(%)
Security of data	1	94.0
Reliability	2	90.0
Lack of standards	3	87.0
Connection dependence	4	82.0
Loss of IT control and ownership	5	80.0
Data centre location	6	77.0
Lack of liability of providers	7	76.6
Regulatory compliance	8	76.1
Complexity	9	74.2
Privacy	10	73.8
Integration	11	72.5
Cost uncertainty	12	71.7
Lack of awareness	13	70.8
Over subscription of services	14	70.2
Data management	15	69.7
Service provider dependence	16	68.4
Internet congestion	17	66.2
Lack of suppliers with satisfactory credentials	18	64.8
Lock-in (switching costs)	19	62.8
Technology dependence	20	60.4
Skills	21	59.8
Unclear scheme in pay-per-use approach	22	53.5

Table VII.
Desirable improvements in Librarika

Improvements	Rank	(%)
Portability of data and applications	1	96.0
Defined rules and regulations	2	92.0
Privacy	3	84.0
Autonomic computing	4	81.0
Migration facility	5	78.0
Enhanced security mechanism	6	76.8
Transparency over data control	7	74.2
Identity management	8	73.8
Union cloud catalogues	9	72.5
Data management	10	69.7
Customization features	11	68.4
Authorization format	12	62.8
Support services	13	60.4
Consumption-based pricing	14	59.8

and regulations (92 per cent), privacy (84 per cent), autonomic computing (81 per cent), migration facility (78 per cent) and enhanced security mechanism are most desired.

Conclusion

It is an established notion that library automation via the cloud is an unavoidable phenomenon for libraries. Traditionally, libraries have tried to automate their system purchasing servers and software, installing, updating and configuring them. In analysis of the cloud-based ILMS, staff review the desirability of different features, modules as well as other conspicuous facets offered by Librarika. Each software product has its own design and defined workflows to meet its primary objectives. From the evaluative study, it was found that Librarika had specific characteristics of the commonly available open-source ILMSs. It is clear from the study that Librarika has a better circulation module and OPAC. However, concerns over data ownership, migration and portability in the cloud are the major bottlenecks in its adoption. To adopt any cloud computing solutions in libraries, there is a need for well-defined regulations as well as transparent policies. The study can be used as a guideline by the libraries that are planning to adopt cloud computing-based solutions in the future.

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