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Web Based Services Provided by University Libraries of BRICS Nations: A Comparative Study

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Abstract

The developments in information and communication technologies (ICT) and their subsequent absorption in library and information science (LIS) have forced information professionals to change the way they are functioning at present. Because of their popularity with the users, an overwhelming attention is being given to the web-based information services in libraries **.**The web 2.0 technologies have rapidly gained huge popularity and as such, the university libraries, being the heart of the highest seats of learning**,** need to equip themselves with all the possible web based, i.e. web 2.0 and allied services. The present study made an endeavour to study the various web 2.0 and allied web based services offered by select university libraries of BRICS nations. This study shows that the web based services in the university libraries of BRICS nations are quite better. The findings show that India and china universities are far behind as compared to Brazil, Russia and South Africa in employability of web 2.0 tools in libraries.

Keywords: Library services, Library 2.0, Web services, BRICS.

Introduction

The continuous and rapid advancements in Information Communication Technologies (ICT) have caused massive and rapid alternations across all human social activities **(Torero & Braun, 2005)**. The development in ICT has facilitated the accessing, transmitting and storing information **(Lopez, 2005).** ICT offers new opportunities for the development of new services and improves quality of life **(Moodley, 2004).** He opines that the result of these electronic activities made the current era known by the "information era" and made individuals or social actors live in Information Societies. The dramatic advances in technologies, particularly in

Internet technologies have changed the way individuals seek and obtain information, as result it changed the learning environments **(Meshal, 2007).** Information is very crucial for the acquisition of knowledge and development. In the present scenario, information has become an available asset for progress and development of every nation which implies present day society is information based society. The internet, which began as primarily a communication tool, has become a very important information resource. The last two decades gave witnessed the rapid transformation of the library in applying information technology. Libraries have developed and diversified their services based on advanced information communication technologies. A typical technology is Web2.0 which has recently emerged as second generation of web- based technologies for communication. Web 2.0 was reportedly first conceptualized and made popular by Tim O' Reilly and Dale Dougherty of O'Reilly Media in 2004 to describe the trends and business models that survived the technology sector market crash of the 1990s **(O'reilly, 2005).** The term is now widely used and interpreted, but Web2.0, essentially, is not a web of textual publication, but a web of multi-sensory communication. It is a matrix of dialogues, not a collection of monologues. It is a user-centered web in ways it has not been thus far. This characterization of the current state of the web is at times contended, and though the clear delineation between the first and second webs is here admitted to be rather arbitrary, it still must be recognized that the web is indeed evolving into a more interactive, multi-media driven technological space. As **O'Reilly (2005)** observes in what is often cited as the "seminal work on Web2.0", personal web-pages are evolving into blogs, encyclopedias into Wikipedia, text-based tutorials into streaming media applications, taxonomies into "folksonomies," and question-answer/ email customer support infrastructures into instant messaging (IM) services. Reference and information services have always been the main component of library Services. As a result of the academic libraries experiencing major shifts in technology, the emergence of the information superhighway has challenged academic libraries to provide web-based reference services to their university populations. Digital reference is a new powerful method of delivering a reference service.

About BRICS

BRICS is   the acronym for   an   association   of   five   major   emerging   national economies: Brazil, Russia, India, China and South Africa. The BRICS Forum, an independent international organization encouraging commercial, political and cultural cooperation between

the BRICS nations, was formed in 2011. In 2015, the five BRICS countries represent over 3.1 billion people, or about 41% of the world population; four out of five members (excluding South Africa) are in the top 10 of the world by population. As of 2018, these five nations have a combined nominal GDP of US$18.6 trillion, about 23.2% of the gross world product, combined GDP (PPP) of around US$40.55 trillion (32% of World's GDP) and an estimated US$4.46 trillion in combined foreign reserves .

Literature Review

A vast amount of literature is available on web resources and services that can be effectively utilized by the libraries. The largest single factor which caused the significant changes in library operations and services in this century is undoubtedly the evolution of Information Technology. While continuing to provide many traditional information services, Libraries are developing new skills and taking new roles that are necessary to support Technology based services (**Maharana & Panda, 2005**). In the words of **Lawrence & Giles (1999)**, web has significantly improved the access to scientific information and resources providing a way of making data & application accessible and shareable, with the added convenience of information retrieval and extraction. According to **Wang, Hawk & Tenopir (2000)** web resources are significantly different from traditional resources available in libraries & in online databases because web resources are networked, re-aggregated, heterogeneous & available in multimedia formats. There are many studies available on the design of library websites, role of library websites, web-based library services, and case studies of individual library websites in the international library literature. **Rhodes and Chelin (1999)** surveyed 68 university libraries in the UK and found that almost three quarters of the libraries make use of the web for user education. **Ahmed (2002)** found in a survey of seven Arabian Gulf university libraries that almost all the libraries are offering web-based services in one way or the other. **Feldman and Strobel (2002)** recommend that for advancing web-based services it is essential to initiate self-service circulation or librarian-mediated online reference. A promising platform provided by the WWW is the advent Web 2.0. Web 2.0 technologies are blogs, wikis, multimedia sharing services, content syndication, podcasting and content tagging (**Anderson, 2007**). A library wiki as a service can enable social interaction among librarians and patrons, essentially moving the study group room online. As users share information and ask questions, answer questions, and librarians do the same within a wiki, a record of these transactions is archived perhaps for perpetuity (**Manes, 2006**). The

implication of blogs for libraries is that they are another form of publication and need to be treated as such**.** Social networks are perhaps the most promising and embracing technology. They enable messaging, blogging, streaming media, and tagging. Libraries are creating RSS feeds for users to subscribe to, including updates on new items in a collection, new services, and new content in subscription databases.

Research Objectives
This study revolves around the following objectives:

- To ascertain the status of the websites of the university libraries.
- To investigate whether the libraries have a direct hyperlink on their university homepage.
- To study the various web 2.0 tools employed by the libraries.
- To analyze and assess digital reference service and various e-resources provided by the libraries..
- To see whether or not remote access is provided to these e-databases.
- To analyze the feedback patterns and institutional repository developed by the libraries.

Scope of the Study
The scope of the present study is restricted to select university libraries of BRICS region. The BRICS region is spread over a large area and is home to around 45 % of world population; as such has one of the vast higher educational set up in place. As such it was not possible to assess and evaluate such a huge number of libraries. Hence it was decided to confine present study to select university libraries by evolving some systematic and scientific methods for selection. This selection procedure in detail is discussed in methodology.

Statement of the Problem
The implications of the revolution in the web, especially of the web 2.0 tools are enormous. The development on ICT has facilitated the accessing, transmitting and storing of information. It has changed the learning and information seeking environments. As such, the university libraries, being the *heart of the highest seats of learning***,** need to equip themselves with all the possible web based services. In this milieu, the present study made an endeavour to study the various web 2.0 and allied web based services offered by select university libraries of BRICS nations.

Methodology
An endeavour was made to identify a comprehensive online directory listing higher educational institutions on the basis of their web traffic. The reason behind this activity was that a university

library is considered as a hub of educational and research activities in the campus. Therefore, the websites of these libraries must be proactive in providing electronic services to their users as well as remote clientele. As such it was presumed that the library websites must have a profound impact on the web traffic of the website of the concerned universities. Therefore, 4icu.org (an international higher education search engine and directory reviewing accredited universities and colleges in the world) was chosen for the selection of universities from each BRICS nation, since it is based on comprehensive mechanism of assessing the web traffic and lists only higher educational institutions websites globally. In order to make the study manageable, top five public sector universities from each BRICS nation were selected from the list provided by 4icu.org. As such only 25 universities were selected for the present study

Data analysis and Interpretation

1 Library Websites- Status

The library websites have been categorized as dedicated and partial. A dedicated website is a full fledged website with a wide range of library services provided through a number of links. A partial website is one that provides only a brief introduction about the library with no other service. The status of the library websites included in the present study has been shown in Table 1

Table 1: Types of the library websites

Libraries from the country	Dedicated	Partial	Under Construction	No Website
Brazil	5	0	0	0
Russia	5	0	0	0
India	5	0	0	0
China	5	0	0	0
South Africa	5	0	0	0
Total	25(100.00)	(0)	(0)	(0)

From Table 1 it is evident that all the selected universities in all the countries have dedicated websites in their universities libraries. None of the university libraries have partial and under construction websites.

2 Linking Mechanism for University Libraries

The websites of the universities included in this study were explored to check whether they provide a direct link to their respective libraries or have an indirect link. A direct link is provided from a main tab present on the home page of the university website. While as, an indirect link is provided from inside sub-section of a tab. The data collected from the websites has been tabulated in the form of Table 2.

Table 2: Library's Hyperlink on University Website

Libraries from the country	Direct Link	Indirect Link
Brazil	5	0
Russia	5	0
India	5	0
China	5	0
South Africa	5	0
Total	25(100.00)	(0)

Number in parentheses indicates percentage

From Table 2, it is evident that all universities from all the countries included under the scope of present study, provide a direct link to their respective libraries

3 Application of Web 2.0 tools and related services in university libraries

Web 2.0 has brought a revolution in the academic world as it has facilitated the accessing transmitting and storing of information. Libraries have also adopted different web 2.0 tools for providing timely information to their users. These web 2.0 tools include blogs, social networking sites, RSS feeds, wikis, micro-blogs etc. The present study includes the employability of RSS feeds, blogs and various social networking sites. These web 2.0 tools have been denoted by different codes in the following sections. The codes used are indicated in Table 3

Table 3: List of the codes used

For	Codes Used	Denotes
	1	RSS Feed
	2	Blog
	3	Facebook

Web 2.0 Tools Used	4	Twitter
	5	LinkedIn
	6	Google+
	7	YouTube
	8	Instagram
	0	Nil
Digital Reference Service	A	Ask a librarian
	B	Chat Service
	C	FAQ's
	0	Nil
Feedback	I	Web Form
	II	Email
	III	Phone
	0	Nil

In case of web 2.0 tools used by the libraries, "1" denotes that the library employs RSS feeds. If the library is having a Blog, It is denoted by "2" and so on. However, a combination of two or more codes denotes the application of two or more web services respectively.

In case of other three parameters, namely access to e-databases, remote access & institutional repository, a simple mechanism of "Yes" and "No" has been adopted.

4   Web 2.0 and other web based services in University Libraries of India

Data related to application of web 2.0 and other web services has been collected from the library websites and is tabulated in the form of Table 4

Table 4: University Libraries in India and their Web Services

LIBRARY OF THE INSTITUTION	Web 2.0 tools used	Digital Ref. Service	Access to E Databases	Remote Access	Institutional Repository	Feed back
Delhi University	0	A,B	Yes	No	No	II,III
Savitribhai Phule university	0	0	Yes	Yes	Yes	II,III
Punjab University	0	0	Yes	No	No	II,III
Anna University	0	0	Yes	Yes	Yes	I
Jawaharlal Nehru University	0	A	Yes	No	No	II,III

Where:

0= Nil	A= Ask a Librarian	I= Web Form
	B= Chat Service	II= Email
		III= Phone

It is revealed from Table 4 that none of the university libraries under the scope of the study have adopted any web 2.0 tools. The digital reference service is provided by only two university libraries, Delhi University (DU) library and JNU (Jawaharlal Nehru University) library. DU library provides digital reference service through "Ask a librarian" (via email) which is an asynchronous mode, and also provides users for "chat" with the library staff (synchronous mode). JNU library provides digital reference service through "Ask a librarian" (via email ID). Savitribhai Phule University Anna University (AU) library, Punjab University (MU) library & Punjab University (PU) library have not yet adopted any mechanism for providing digital reference services.

All the five university libraries provide access to various e-databases to their users, both subscribed by the libraries themselves and from UGC-INFONET Consortium. These e-databases can be accessed only in the respective university campuses, except for JNU library which provides remote access to its users through Virtual Private Network (VPN) requiring a cyber ID and password

Anna University (AU) library and Savitribhai Phule University library have also maintained an institutional repository. The AU repository provides access to the scholarly output of the university, faculty and department wise. JNU "Institutional Repository" contains only IMDS (International Migration and Diaspora Studies Project) papers. DU library, JNU library and PU library have failed to develop an institutional repository. Feedback facility is supported by five university libraries

5 Web 2.0 and other web based services in University Libraries of China

The data collected from the university libraries' websites has been tabulated in the form of Table 5, from which the present situation of web 2.0 and other web based services provided by these libraries can be assessed.

Table 5: University libraries in China and their Web Services

LIBRARY OF THE INSTITUTION	Web 2.0 tools used	Digital Ref. Service	Access to E Databases	Remote Access	Institutional Repository	Feed back
Fudan University(FU)	0	0	Yes	No	No	II,III
Shanghai Jiao Tong University	0	0	Yes	No	No	II,III
Peking University(PU)	0	0	Yes	No	yes	II,III
University of Science and Technology of China	0	0	Yes	No	No	II,III
Nanjing University (NU)	0	A	Yes	No	No	III

Where: A= Ask a Librarian

II= Email   III= Phone

It is revealed from Table 7 that just none of the university library coming under the purview of this study, is employing various web 2.0 tools. Digital reference service is provided by Nanjing university library only. NU library provides " Ask a Librarian" wherein the users can chat with the professional staff of the library related to their query. Fudan University (FU), Shanghai Jiao Tong University, Peking University (PU) and University of Science and Technology of China have failed to introduce the provisions of digital reference services. All the five university libraries provide access to various e-databases, both subscribed by the libraries themselves as well as the resources. These e-databases can be accessed only through the LAN's of the respective libraries, i.e., these databases can be accessed by the members of the respective libraries on their own university campuses only. None of the libraries is providing the facility of remote access to their

users. Only PU and NU university libraries have developed institutional repository of their own. Five libraries, FU library, Jiao Tong University library, Peking University (PU) library , University of Science and Technology of China library and Nanjing University library provide the facility for feedback

6 Web 2.0 and other web based services in University Libraries of Russia

The employability of the web 2.0 tools and other web based services provided by the university libraries of Russia included in this study has been shown in Table 6.

Table 6: University Libraries in Russia and their Web Services

LIBRARY OF THE INSTITUTION	Web 2.0 tools used	Digital Ref. Service	Access to E Databases	Remote Access	Institutional Repository	Feed back
Moscow State University	0	0	Yes	No	No	II,III
National Research University Higher School of Economics	0	A	Yes	Yes	No	III
St. Petersburg State University	3,4,7,8	0	Yes	No	No	II,III
Novosibirsk State University	0	A	Yes	No	No	II,III
ITMO university	3,4,6,7	A	Yes	No	Yes	II,III

Where: 3= Facebook 7= You Tube

4= Twitter 8=Instagram

6= Google+ 0= Nil

II= Email III= Phone

A= Ask a Librarian

Two university libraries employ web 2.0 tools for reaching to the wider user community. St. Petersburg State University library uses Facebook, Twitter, You Tube and Instagram to promote the various library events and also make users aware of the various library activities. ITMO university library also employs these four tools along with Facebook, Twitter, Google+ and You Tube .These tools are also used as platforms for discussions. Moscow State University, National Research University Higher School of Economics and Novosibirsk State University libraries are

lagging behind in effectively employing the web 2.0 tools. Only three University maintained digital reference service namely National Research University Higher School of Economics, Novosibirsk State University and ITMO university library.

All the five university libraries provide access to various scholarly e- databases that facilitate the students, researchers and the faculty to get quality scientific information from around the globe. However, all these databases can be accessed only in the university campuses .Only National Research University Higher School of Economics library provides remote access to its users, who have to login through their user name and password (provided to the bonafide members of the library).

Russia university libraries are lagging in terms of institutional repositories, only ITMO university library have maintained their own institutional repository.

Feedback facility is maintained by:-

- Moscow State University in the form of email and phone,
- ITMO university library in the form of email and phone,
- National Research University Higher School of Economics in the form of phone,
- St. Petersburg State University in the form of email and phone
- Novosibirsk State University in the form of email and phone

7 Web 2.0 and other web based services in University Libraries of South Africa

The data related to application of web 2.0 and other web based services provided by libraries in South Africa coming under the purview of this study is tabulated in the form of Table 7, that depicts the position of the university libraries in terms of their web based services.

Table 7: University libraries in South Africa and their Web Services

LIBRARY OF THE INSTITUTION	Web 2.0 tools used	Digital Ref. Service	Access to E Databases	Remote Access	Institutional Repository	Feed back
University of Pretoria	4,7	A,B	Yes	No	No	II, III
University of Cape town	3,4,5,6	0	Yes	No	No	II,III
University of Witwatersrand	3,4,5,6	A	Yes	No	No	II,III
University of Kwa Zulu Ntal	1	A	Yes	No	No	II

| University of Johannesburg | 1,3,4,5,7 | A,C | Yes | No | Yes | III |

Where:	1=RSS Feeds	5=LinkedIn
	3=Facebook	6= Google+
	4=You Tube	7=Twitter
	A= Ask a Librarian	B= Chat Service, C=FAQ'
	II= Email, III= Phone	

It is evident from the Table 7 that all the five university libraries are using web 2.0 tools in their respective libraries in South Africa. Only University of Cape town library does not provide the digital reference, rest of all four university libraries provide digital reference service in the form of Ask a Librarian, Chat Service and FAQs. All five libraries, University of Pretoria library, University of Cape town library, University of Witwatersrand Library, University of KwaZulu Ntal library and University of Johannesburg library provide access to the various e-databases for the use of students, researchers, and other faculty. No one library is provide remote access facility to their students , researchers and faculty members. University of Johannesburg library is the only university that maintains their own institutional repository of their own. All five university libraries are providing the feedback facility to their patrons

8 Web 2.0 and other web based services in University Libraries of Brazil

The data collected from the university libraries' websites has been tabulated in the form of Table 8, from which the present situation of web 2.0 and other web based services provided by these libraries can be assessed

Table 8: University Libraries in Brazil and their Web Services

LIBRARY OF THE INSTITUTION	Web 2.0 tools Used	Digital Ref. Service	Access to E Databases	Remote Access	Institutional Repository	Feed back
Universidade de sao Paulo	1,3,4,6,7	0	Yes	No	No	II
Universidade de Federal do Rio Grande do sul	0	0	Yes	No	No	III
Universidade de Brasilia	3,4	0	Yes	No	Yes	III

Universidade de Estadual de Campinas	3,4,6,7	0	Yes	No	No	III
Universidade de Federal de Santa Catarina	1,3,4,7,8	0	Yes	No	Yes	II

Where: 1=RSS Feeds   7= You Tube   II= Email

3= Facebook   8=Instagram   III= Phone

4= Twitter   0= Nil

6= Google+

All four university libraries Universidade de sao Paulo, Universidade de Brasilia, Universidade de Estadual de Campinas and Universidade de Federal de Santa Catarina are using various social media tools in their libraries. Only single library Universidade de Federal do Rio Grande do sul does not use any social media tool. None of the libraries is providing digital reference service. However, all the five university libraries provide to their users access to the scholarly publications through e-databases. The e-resources are accessible in the respective university campuses in all universities because no one university is providing the remote access facility to their researchers. Only two university libraries Universidade de Brasilia and Universidade de Federal de Santa Catarina have maintained their institutional repository. Feedback facility are provided in all libraries in the form of email and phone.

Conclusion

Information and Communication Technology has brought unprecedented change and transformation to library and information services. It has created an environment where rapid continuous change had become a norm.ICT has reduced the library from its statures as custodian of our literary heritage to being a competitor among many others in the information society. Some libraries provide only minimal information about their collection and services; while as many libraries offer web OPAC's, access to online databases, e-books, virtual reference service, electronic reserves, web based user education tools, virtual tours, etc. LIS professionals must recognize the significance of web based library services, especially in the present scenario of information era, and take the initiative to provide them .The ICT infrastructure in the university libraries should be enhanced and upgraded so as to keep pace with the rapid advancements in technologies. The website of the library should be attractive and should host a range of wonderful services as per the needs of their users. University libraries should strive to employ

web 2.0 technologies and to get connected with the users , the libraries should show their presence on popular social networking sites, like Facebook, Twitter, etc. the libraries should provide a service comparable to those provided by SNS's, i.e. a university library website should be a one-stop shop for a wide range of services, which can include "Google custom Search", "online book shopping", etc. a library blog should be maintained so that the users can comment upon or rate resources available with the library in an interactive manner. Libraries can also use their blog as a news bulletin. The mechanisms for providing digital reference services should be necessarily adopted by the university libraries so that the remote clienteles of the library could be benefitted. The library's website should enlist the various e-resources available with the library as well as reliable open access resources with proper links to their contents, so that the information needs of their users could be satisfied.

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